

**B<sup>±</sup>**

$$I(J^P) = \frac{1}{2}(0^-)$$

Quantum numbers not measured. Values shown are quark-model predictions.

See also the  $B^\pm/B^0$  ADMIXTURE and  $B^\pm/B^0/B_s^0/b$ -baryon ADMIXTURE sections.

### $B^\pm$ MASS

The fit uses  $m_{B^+}$ ,  $(m_{B^0} - m_{B^+})$ , and  $m_{B^0}$  to determine  $m_{B^+}$ ,  $m_{B^0}$ , and the mass difference.

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
<b>5279.31 ± 0.15 OUR FIT</b>	Error includes scale factor of 1.1.			
<b>5279.25 ± 0.26 OUR AVERAGE</b>				
5279.38 ± 0.11 ± 0.33		<sup>1</sup> AAIJ	12E	LHCB $pp$ at 7 TeV
5279.10 ± 0.41 ± 0.36		<sup>2</sup> ACOSTA	06	CDF $p\bar{p}$ at 1.96 TeV
5279.1 ± 0.4 ± 0.4	526	<sup>3</sup> CSORNA	00	CLE2 $e^+e^- \rightarrow \Upsilon(4S)$
5279.1 ± 1.7 ± 1.4	147	ABE	96B	CDF $p\bar{p}$ at 1.8 TeV
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
5278.8 ± 0.54 ± 2.0	362	ALAM	94	CLE2 $e^+e^- \rightarrow \Upsilon(4S)$
5278.3 ± 0.4 ± 2.0		BORTOLETTO92		CLEO $e^+e^- \rightarrow \Upsilon(4S)$
5280.5 ± 1.0 ± 2.0		<sup>4</sup> ALBRECHT	90J	ARG $e^+e^- \rightarrow \Upsilon(4S)$
5275.8 ± 1.3 ± 3.0	32	ALBRECHT	87C	ARG $e^+e^- \rightarrow \Upsilon(4S)$
5278.2 ± 1.8 ± 3.0	12	<sup>5</sup> ALBRECHT	87D	ARG $e^+e^- \rightarrow \Upsilon(4S)$
5278.6 ± 0.8 ± 2.0		BEBEK	87	CLEO $e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Uses  $B^+ \rightarrow J/\psi K^+$  fully reconstructed decays.

<sup>2</sup> Uses exclusively reconstructed final states containing a  $J/\psi \rightarrow \mu^+\mu^-$  decays.

<sup>3</sup> CSORNA 00 uses fully reconstructed 526  $B^+ \rightarrow J/\psi(^1)K^+$  events and invariant masses without beam constraint.

<sup>4</sup> ALBRECHT 90J assumes 10580 for  $\Upsilon(4S)$  mass. Supersedes ALBRECHT 87C and ALBRECHT 87D.

<sup>5</sup> Found using fully reconstructed decays with  $J/\psi(1S)$ . ALBRECHT 87D assume  $m_{\Upsilon(4S)} = 10577$  MeV.

### $B^\pm$ MEAN LIFE

See  $B^\pm/B^0/B_s^0/b$ -baryon ADMIXTURE section for data on  $B$ -hadron mean life averaged over species of bottom particles.

“OUR EVALUATION” is an average using rescaled values of the data listed below. The average and rescaling were performed by the Heavy Flavor Averaging Group (HFAG) and are described at <http://www.slac.stanford.edu/xorg/hfag/>. The averaging/rescaling procedure takes into account correlations between the measurements and asymmetric lifetime errors.

VALUE ( $10^{-12}$ s)	EVTS	DOCUMENT ID	TECN	COMMENT
<b>1.638 ± 0.004 OUR EVALUATION</b>				
1.637 ± 0.004 ± 0.003		AAIJ	14E	LHCB $pp$ at 7 TeV
1.639 ± 0.009 ± 0.009		<sup>1</sup> AALTONEN	11	CDF $p\bar{p}$ at 1.96 TeV

1.663±0.023±0.015		<sup>2</sup> AALTONEN	11B	CDF	$p\bar{p}$ at 1.96 TeV
1.635±0.011±0.011		<sup>3</sup> ABE	05B	BELL	$e^+e^- \rightarrow \Upsilon(4S)$
1.624±0.014±0.018		<sup>4</sup> ABDALLAH	04E	DLPH	$e^+e^- \rightarrow Z$
1.636±0.058±0.025		<sup>5</sup> ACOSTA	02C	CDF	$p\bar{p}$ at 1.8 TeV
1.673±0.032±0.023		<sup>6</sup> AUBERT	01F	BABR	$e^+e^- \rightarrow \Upsilon(4S)$
1.648±0.049±0.035		<sup>7</sup> BARATE	00R	ALEP	$e^+e^- \rightarrow Z$
1.643±0.037±0.025		<sup>8</sup> ABBIENDI	99J	OPAL	$e^+e^- \rightarrow Z$
1.637±0.058 <sup>+0.045</sup> <sub>-0.043</sub>		<sup>7</sup> ABE	98Q	CDF	$p\bar{p}$ at 1.8 TeV
1.66 ±0.06 ±0.03		<sup>8</sup> ACCIARRI	98S	L3	$e^+e^- \rightarrow Z$
1.66 ±0.06 ±0.05		<sup>8</sup> ABE	97J	SLD	$e^+e^- \rightarrow Z$
1.58 <sup>+0.21</sup> <sub>-0.18</sub> <sup>+0.04</sup> <sub>-0.03</sub>	94	<sup>5</sup> BUSKULIC	96J	ALEP	$e^+e^- \rightarrow Z$
1.61 ±0.16 ±0.12		<sup>7,9</sup> ABREU	95Q	DLPH	$e^+e^- \rightarrow Z$
1.72 ±0.08 ±0.06		<sup>10</sup> ADAM	95	DLPH	$e^+e^- \rightarrow Z$
1.52 ±0.14 ±0.09		<sup>7</sup> AKERS	95T	OPAL	$e^+e^- \rightarrow Z$

• • • We do not use the following data for averages, fits, limits, etc. • • •

1.695±0.026±0.015		<sup>6</sup> ABE	02H	BELL	Repl. by ABE 05B
1.68 ±0.07 ±0.02		<sup>5</sup> ABE	98B	CDF	Repl. by ACOSTA 02C
1.56 ±0.13 ±0.06		<sup>7</sup> ABE	96C	CDF	Repl. by ABE 98Q
1.58 ±0.09 ±0.03		<sup>11</sup> BUSKULIC	96J	ALEP	$e^+e^- \rightarrow Z$
1.58 ±0.09 ±0.04		<sup>7</sup> BUSKULIC	96J	ALEP	Repl. by BARATE 00R
1.70 ±0.09		<sup>12</sup> ADAM	95	DLPH	$e^+e^- \rightarrow Z$
1.61 ±0.16 ±0.05	148	<sup>5</sup> ABE	94D	CDF	Repl. by ABE 98B
1.30 <sup>+0.33</sup> <sub>-0.29</sub> ±0.16	92	<sup>7</sup> ABREU	93D	DLPH	Sup. by ABREU 95Q
1.56 ±0.19 ±0.13	134	<sup>10</sup> ABREU	93G	DLPH	Sup. by ADAM 95
1.51 <sup>+0.30</sup> <sub>-0.28</sub> <sup>+0.12</sup> <sub>-0.14</sub>	59	<sup>7</sup> ACTON	93C	OPAL	Sup. by AKERS 95T
1.47 <sup>+0.22</sup> <sub>-0.19</sub> <sup>+0.15</sup> <sub>-0.14</sub>	77	<sup>7</sup> BUSKULIC	93D	ALEP	Sup. by BUSKULIC 96J

<sup>1</sup> Measured mean life using fully reconstructed decays ( $J/\psi K^{(*)}$ ).

<sup>2</sup> Measured using  $B^- \rightarrow D^0 \pi^-$  with  $D^0 \rightarrow K^- \pi^+$  events that were selected using a silicon vertex trigger.

<sup>3</sup> Measurement performed using a combined fit of  $CP$ -violation, mixing and lifetimes.

<sup>4</sup> Measurement performed using an inclusive reconstruction and  $B$  flavor identification technique.

<sup>5</sup> Measured mean life using fully reconstructed decays.

<sup>6</sup> Events are selected in which one  $B$  meson is fully reconstructed while the second  $B$  meson is reconstructed inclusively.

<sup>7</sup> Data analyzed using  $D/D^* \ell X$  event vertices.

<sup>8</sup> Data analyzed using charge of secondary vertex.

<sup>9</sup> ABREU 95Q assumes  $B(B^0 \rightarrow D^{*-} \ell^+ \nu_\ell) = 3.2 \pm 1.7\%$ .

<sup>10</sup> Data analyzed using vertex-charge technique to tag  $B$  charge.

<sup>11</sup> Combined result of  $D/D^* \ell X$  analysis and fully reconstructed  $B$  analysis.

<sup>12</sup> Combined ABREU 95Q and ADAM 95 result.

### $\tau_{B^+}/\tau_{B^-}$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>1.002±0.004±0.002</b>	<sup>1</sup> AAIJ	14E	LHCB $pp$ at 7 TeV

<sup>1</sup> Measured using  $B^\pm \rightarrow J/\psi K^\pm$  decays.

## $B^+$ DECAY MODES

$B^-$  modes are charge conjugates of the modes below. Modes which do not identify the charge state of the  $B$  are listed in the  $B^\pm/B^0$  ADMIXTURE section.

The branching fractions listed below assume 50%  $B^0\bar{B}^0$  and 50%  $B^+B^-$  production at the  $\Upsilon(4S)$ . We have attempted to bring older measurements up to date by rescaling their assumed  $\Upsilon(4S)$  production ratio to 50:50 and their assumed  $D$ ,  $D_S$ ,  $D^*$ , and  $\psi$  branching ratios to current values whenever this would affect our averages and best limits significantly.

Indentation is used to indicate a subchannel of a previous reaction. All resonant subchannels have been corrected for resonance branching fractions to the final state so the sum of the subchannel branching fractions can exceed that of the final state.

For inclusive branching fractions, *e.g.*,  $B \rightarrow D^\pm$  anything, the values usually are multiplicities, not branching fractions. They can be greater than one.

Mode	Fraction ( $\Gamma_i/\Gamma$ )	Scale factor/ Confidence level
<b>Semileptonic and leptonic modes</b>		
$\Gamma_1$ $\ell^+ \nu_\ell$ anything	[a] ( 10.99 $\pm$ 0.28 ) %	
$\Gamma_2$ $e^+ \nu_e X_c$	( 10.8 $\pm$ 0.4 ) %	
$\Gamma_3$ $D \ell^+ \nu_\ell$ anything	( 9.8 $\pm$ 0.7 ) %	
$\Gamma_4$ $\bar{D}^0 \ell^+ \nu_\ell$	[a] ( 2.27 $\pm$ 0.11 ) %	
$\Gamma_5$ $\bar{D}^0 \tau^+ \nu_\tau$	( 7.7 $\pm$ 2.5 ) $\times 10^{-3}$	
$\Gamma_6$ $\bar{D}^*(2007)^0 \ell^+ \nu_\ell$	[a] ( 5.69 $\pm$ 0.19 ) %	
$\Gamma_7$ $\bar{D}^*(2007)^0 \tau^+ \nu_\tau$	( 1.88 $\pm$ 0.20 ) %	
$\Gamma_8$ $D^- \pi^+ \ell^+ \nu_\ell$	( 4.2 $\pm$ 0.5 ) $\times 10^{-3}$	
$\Gamma_9$ $\bar{D}_0^*(2420)^0 \ell^+ \nu_\ell, \bar{D}_0^{*0} \rightarrow$	( 2.5 $\pm$ 0.5 ) $\times 10^{-3}$	
$\Gamma_{10}$ $D^- \pi^+ \bar{D}_2^*(2460)^0 \ell^+ \nu_\ell, \bar{D}_2^{*0} \rightarrow$	( 1.53 $\pm$ 0.16 ) $\times 10^{-3}$	
$\Gamma_{11}$ $D^{(*)} n \pi \ell^+ \nu_\ell (n \geq 1)$	( 1.87 $\pm$ 0.26 ) %	
$\Gamma_{12}$ $D^{*-} \pi^+ \ell^+ \nu_\ell$	( 6.1 $\pm$ 0.6 ) $\times 10^{-3}$	
$\Gamma_{13}$ $\bar{D}_1(2420)^0 \ell^+ \nu_\ell, \bar{D}_1^0 \rightarrow$	( 3.03 $\pm$ 0.20 ) $\times 10^{-3}$	
$\Gamma_{14}$ $D_1^{*-} \pi^+ \bar{D}'_1(2430)^0 \ell^+ \nu_\ell, \bar{D}'_1{}^0 \rightarrow$	( 2.7 $\pm$ 0.6 ) $\times 10^{-3}$	
$\Gamma_{15}$ $D_2^{*-} \pi^+ \bar{D}_2^*(2460)^0 \ell^+ \nu_\ell, \bar{D}_2^{*0} \rightarrow$	( 1.01 $\pm$ 0.24 ) $\times 10^{-3}$	S=2.0
$\Gamma_{16}$ $\bar{D}^0 \pi^+ \pi^- \ell^+ \nu_\ell$	( 1.6 $\pm$ 0.4 ) $\times 10^{-3}$	
$\Gamma_{17}$ $\bar{D}^{*0} \pi^+ \pi^- \ell^+ \nu_\ell$	( 8 $\pm$ 5 ) $\times 10^{-4}$	
$\Gamma_{18}$ $D_s^{(*)-} K^+ \ell^+ \nu_\ell$	( 6.1 $\pm$ 1.0 ) $\times 10^{-4}$	

$\Gamma_{19}$	$D_s^- K^+ \ell^+ \nu_\ell$	$( 3.0 \begin{smallmatrix} + \\ - \end{smallmatrix} \frac{1.4}{1.2} ) \times 10^{-4}$
$\Gamma_{20}$	$D_s^{*-} K^+ \ell^+ \nu_\ell$	$( 2.9 \pm 1.9 ) \times 10^{-4}$
$\Gamma_{21}$	$\pi^0 \ell^+ \nu_\ell$	$( 7.80 \pm 0.27 ) \times 10^{-5}$
$\Gamma_{22}$	$\pi^0 e^+ \nu_e$	
$\Gamma_{23}$	$\eta \ell^+ \nu_\ell$	$( 3.8 \pm 0.6 ) \times 10^{-5}$
$\Gamma_{24}$	$\eta' \ell^+ \nu_\ell$	$( 2.3 \pm 0.8 ) \times 10^{-5}$
$\Gamma_{25}$	$\omega \ell^+ \nu_\ell$	[a] $( 1.19 \pm 0.09 ) \times 10^{-4}$
$\Gamma_{26}$	$\omega \mu^+ \nu_\mu$	
$\Gamma_{27}$	$\rho^0 \ell^+ \nu_\ell$	[a] $( 1.58 \pm 0.11 ) \times 10^{-4}$
$\Gamma_{28}$	$p \bar{p} \ell^+ \nu_\ell$	$( 5.8 \begin{smallmatrix} + \\ - \end{smallmatrix} \frac{2.6}{2.3} ) \times 10^{-6}$
$\Gamma_{29}$	$p \bar{p} \mu^+ \nu_\mu$	$< 8.5 \times 10^{-6}$ CL=90%
$\Gamma_{30}$	$p \bar{p} e^+ \nu_e$	$( 8.2 \begin{smallmatrix} + \\ - \end{smallmatrix} \frac{4.0}{3.3} ) \times 10^{-6}$
$\Gamma_{31}$	$e^+ \nu_e$	$< 9.8 \times 10^{-7}$ CL=90%
$\Gamma_{32}$	$\mu^+ \nu_\mu$	$< 1.0 \times 10^{-6}$ CL=90%
$\Gamma_{33}$	$\tau^+ \nu_\tau$	$( 1.09 \pm 0.24 ) \times 10^{-4}$ S=1.2
$\Gamma_{34}$	$\ell^+ \nu_\ell \gamma$	$< 3.5 \times 10^{-6}$ CL=90%
$\Gamma_{35}$	$e^+ \nu_e \gamma$	$< 6.1 \times 10^{-6}$ CL=90%
$\Gamma_{36}$	$\mu^+ \nu_\mu \gamma$	$< 3.4 \times 10^{-6}$ CL=90%

#### Inclusive modes

$\Gamma_{37}$	$D^0 X$	$( 8.6 \pm 0.7 ) \%$
$\Gamma_{38}$	$\bar{D}^0 X$	$( 79 \pm 4 ) \%$
$\Gamma_{39}$	$D^+ X$	$( 2.5 \pm 0.5 ) \%$
$\Gamma_{40}$	$D^- X$	$( 9.9 \pm 1.2 ) \%$
$\Gamma_{41}$	$D_s^+ X$	$( 7.9 \begin{smallmatrix} + \\ - \end{smallmatrix} \frac{1.4}{1.3} ) \%$
$\Gamma_{42}$	$D_s^- X$	$( 1.10 \begin{smallmatrix} + \\ - \end{smallmatrix} \frac{0.40}{0.32} ) \%$
$\Gamma_{43}$	$\Lambda_c^+ X$	$( 2.1 \begin{smallmatrix} + \\ - \end{smallmatrix} \frac{0.9}{0.6} ) \%$
$\Gamma_{44}$	$\bar{\Lambda}_c^- X$	$( 2.8 \begin{smallmatrix} + \\ - \end{smallmatrix} \frac{1.1}{0.9} ) \%$
$\Gamma_{45}$	$\bar{c} X$	$( 97 \pm 4 ) \%$
$\Gamma_{46}$	$c X$	$( 23.4 \begin{smallmatrix} + \\ - \end{smallmatrix} \frac{2.2}{1.8} ) \%$
$\Gamma_{47}$	$c / \bar{c} X$	$( 120 \pm 6 ) \%$

#### $D, D^*$ , or $D_s$ modes

$\Gamma_{48}$	$\bar{D}^0 \pi^+$	$( 4.80 \pm 0.15 ) \times 10^{-3}$
$\Gamma_{49}$	$D_{CP(+)} \pi^+$	[b] $( 2.19 \pm 0.24 ) \times 10^{-3}$
$\Gamma_{50}$	$D_{CP(-)} \pi^+$	[b] $( 2.1 \pm 0.4 ) \times 10^{-3}$
$\Gamma_{51}$	$\bar{D}^0 \rho^+$	$( 1.34 \pm 0.18 ) \%$
$\Gamma_{52}$	$\bar{D}^0 K^+$	$( 3.69 \pm 0.17 ) \times 10^{-4}$
$\Gamma_{53}$	$D_{CP(+)} K^+$	[b] $( 1.91 \pm 0.14 ) \times 10^{-4}$

$\Gamma_{54}$	$D_{CP(-1)} K^+$	[b]	$(1.99 \pm 0.19) \times 10^{-4}$
$\Gamma_{55}$	$[K^- \pi^+]_D K^+$	[c]	$< 2.8 \times 10^{-7}$ CL=90%
$\Gamma_{56}$	$[K^+ \pi^-]_D K^+$	[c]	$< 1.8 \times 10^{-5}$ CL=90%
$\Gamma_{57}$	$[K^- \pi^+ \pi^0]_D K^+$		seen
$\Gamma_{58}$	$[K^+ \pi^- \pi^0]_D K^+$		seen
$\Gamma_{59}$	$[K^- \pi^+ \pi^+ \pi^-]_D K^+$		seen
$\Gamma_{60}$	$[K^+ \pi^- \pi^+ \pi^-]_D K^+$		seen
$\Gamma_{61}$	$[K^- \pi^+]_D K^*(892)^+$	[c]	
$\Gamma_{62}$	$[K^+ \pi^-]_D K^*(892)^+$	[c]	
$\Gamma_{63}$	$[K^- \pi^+]_D \pi^+$	[c]	$(6.3 \pm 1.1) \times 10^{-7}$
$\Gamma_{64}$	$[K^+ \pi^-]_D \pi^+$		$(1.68 \pm 0.31) \times 10^{-4}$
$\Gamma_{65}$	$[K^- \pi^+ \pi^0]_D \pi^+$		seen
$\Gamma_{66}$	$[K^+ \pi^- \pi^0]_D \pi^+$		seen
$\Gamma_{67}$	$[K^- \pi^+ \pi^+ \pi^-]_D \pi^+$		seen
$\Gamma_{68}$	$[K^+ \pi^- \pi^+ \pi^-]_D \pi^+$		seen
$\Gamma_{69}$	$[K^- \pi^+]_{(D\pi)} \pi^+$		
$\Gamma_{70}$	$[K^+ \pi^-]_{(D\pi)} \pi^+$		
$\Gamma_{71}$	$[K^- \pi^+]_{(D\gamma)} \pi^+$		
$\Gamma_{72}$	$[K^+ \pi^-]_{(D\gamma)} \pi^+$		
$\Gamma_{73}$	$[K^- \pi^+]_{(D\pi)} K^+$		
$\Gamma_{74}$	$[K^+ \pi^-]_{(D\pi)} K^+$		
$\Gamma_{75}$	$[K^- \pi^+]_{(D\gamma)} K^+$		
$\Gamma_{76}$	$[K^+ \pi^-]_{(D\gamma)} K^+$		
$\Gamma_{77}$	$[\pi^+ \pi^- \pi^0]_D K^-$		$(4.6 \pm 0.9) \times 10^{-6}$
$\Gamma_{78}$	$[K_S^0 K^+ \pi^-]_D K^+$		seen
$\Gamma_{79}$	$[K_S^0 K^- \pi^+]_D K^+$		seen
$\Gamma_{80}$	$[K^*(892)^+ K^-]_D K^+$		seen
$\Gamma_{81}$	$[K_S^0 K^- \pi^+]_D \pi^+$		seen
$\Gamma_{82}$	$[K^*(892)^+ K^-]_D \pi^+$		seen
$\Gamma_{83}$	$[K_S^0 K^+ \pi^-]_D \pi^+$		seen
$\Gamma_{84}$	$[K^*(892)^- K^+]_D \pi^+$		seen
$\Gamma_{85}$	$[K^+ K^- \pi^0]_D K^+$		
$\Gamma_{86}$	$[K^+ K^- \pi^0]_D \pi^+$		
$\Gamma_{87}$	$[\pi^+ \pi^- \pi^0]_D K^+$		
$\Gamma_{88}$	$[\pi^+ \pi^- \pi^0]_D \pi^+$		
$\Gamma_{89}$	$\overline{D}^0 K^*(892)^+$		$(5.3 \pm 0.4) \times 10^{-4}$
$\Gamma_{90}$	$D_{CP(-1)} K^*(892)^+$	[b]	$(2.7 \pm 0.8) \times 10^{-4}$
$\Gamma_{91}$	$D_{CP(+1)} K^*(892)^+$	[b]	$(5.8 \pm 1.1) \times 10^{-4}$
$\Gamma_{92}$	$\overline{D}^0 K^+ \pi^+ \pi^-$		$(5.4 \pm 2.2) \times 10^{-4}$
$\Gamma_{93}$	$[K^+ \pi^-]_D K^+ \pi^- \pi^+$		
$\Gamma_{94}$	$[K^- \pi^+]_D K^+ \pi^- \pi^+$		
$\Gamma_{95}$	$D_{CP(+1)} K^+ \pi^- \pi^+$		

$\Gamma_{96}$	$\bar{D}^0 K^+ \bar{K}^0$	$( 5.5 \pm 1.6 ) \times 10^{-4}$	
$\Gamma_{97}$	$\bar{D}^0 K^+ \bar{K}^*(892)^0$	$( 7.5 \pm 1.7 ) \times 10^{-4}$	
$\Gamma_{98}$	$\bar{D}^0 \pi^+ \pi^+ \pi^-$	$( 5.7 \pm 2.2 ) \times 10^{-3}$	S=3.6
$\Gamma_{99}$	$[K^- \pi^+]_D \pi^+ \pi^- \pi^+$		
$\Gamma_{100}$	$\bar{D}^0 \pi^+ \pi^+ \pi^-$ nonresonant	$( 5 \pm 4 ) \times 10^{-3}$	
$\Gamma_{101}$	$\bar{D}^0 \pi^+ \rho^0$	$( 4.2 \pm 3.0 ) \times 10^{-3}$	
$\Gamma_{102}$	$\bar{D}^0 a_1(1260)^+$	$( 4 \pm 4 ) \times 10^{-3}$	
$\Gamma_{103}$	$\bar{D}^0 \omega \pi^+$	$( 4.1 \pm 0.9 ) \times 10^{-3}$	
$\Gamma_{104}$	$D^*(2010)^- \pi^+ \pi^+$	$( 1.35 \pm 0.22 ) \times 10^{-3}$	
$\Gamma_{105}$	$\bar{D}_1(2420)^0 \pi^+, \bar{D}_1^0 \rightarrow$ $D^*(2010)^- \pi^+$	$( 5.3 \pm 2.3 ) \times 10^{-4}$	
$\Gamma_{106}$	$D^- \pi^+ \pi^+$	$( 1.07 \pm 0.05 ) \times 10^{-3}$	
$\Gamma_{107}$	$D^- K^+ \pi^+$	$( 7.7 \pm 0.5 ) \times 10^{-5}$	
$\Gamma_{108}$	$D_0^*(2400)^0 K^+, D_0^{*0} \rightarrow$ $D^- \pi^+$	$( 6.1 \pm 2.4 ) \times 10^{-4}$	
$\Gamma_{109}$	$D_1^*(2760)^0 K^+, D_1^{*0} \rightarrow$ $D^- \pi^+$	$( 3.6 \pm 1.2 ) \times 10^{-4}$	
$\Gamma_{110}$	$D_2^*(2460)^0 K^+, D_2^{*0} \rightarrow$ $D^- \pi^+$	$( 2.32 \pm 0.23 ) \times 10^{-3}$	
$\Gamma_{111}$	$D^+ K^0$	$< 2.9$	$\times 10^{-6}$ CL=90%
$\Gamma_{112}$	$D^+ K^{*0}$	$< 1.8$	$\times 10^{-6}$ CL=90%
$\Gamma_{113}$	$D^+ \bar{K}^{*0}$	$< 1.4$	$\times 10^{-6}$ CL=90%
$\Gamma_{114}$	$\bar{D}^*(2007)^0 \pi^+$	$( 5.18 \pm 0.26 ) \times 10^{-3}$	
$\Gamma_{115}$	$\bar{D}_{CP(+1)}^{*0} \pi^+$	[d] $( 2.9 \pm 0.7 ) \times 10^{-3}$	
$\Gamma_{116}$	$D_{CP(-1)}^{*0} \pi^+$	[d] $( 2.6 \pm 1.0 ) \times 10^{-3}$	
$\Gamma_{117}$	$\bar{D}^*(2007)^0 \omega \pi^+$	$( 4.5 \pm 1.2 ) \times 10^{-3}$	
$\Gamma_{118}$	$\bar{D}^*(2007)^0 \rho^+$	$( 9.8 \pm 1.7 ) \times 10^{-3}$	
$\Gamma_{119}$	$\bar{D}^*(2007)^0 K^+$	$( 4.20 \pm 0.34 ) \times 10^{-4}$	
$\Gamma_{120}$	$\bar{D}_{CP(+1)}^{*0} K^+$	[d] $( 2.8 \pm 0.4 ) \times 10^{-4}$	
$\Gamma_{121}$	$\bar{D}_{CP(-1)}^{*0} K^+$	[d] $( 2.31 \pm 0.33 ) \times 10^{-4}$	
$\Gamma_{122}$	$\bar{D}^*(2007)^0 K^*(892)^+$	$( 8.1 \pm 1.4 ) \times 10^{-4}$	
$\Gamma_{123}$	$\bar{D}^*(2007)^0 K^+ \bar{K}^0$	$< 1.06$	$\times 10^{-3}$ CL=90%
$\Gamma_{124}$	$\bar{D}^*(2007)^0 K^+ K^*(892)^0$	$( 1.5 \pm 0.4 ) \times 10^{-3}$	
$\Gamma_{125}$	$\bar{D}^*(2007)^0 \pi^+ \pi^+ \pi^-$	$( 1.03 \pm 0.12 ) \%$	
$\Gamma_{126}$	$\bar{D}^*(2007)^0 a_1(1260)^+$	$( 1.9 \pm 0.5 ) \%$	
$\Gamma_{127}$	$\bar{D}^*(2007)^0 \pi^- \pi^+ \pi^+ \pi^0$	$( 1.8 \pm 0.4 ) \%$	
$\Gamma_{128}$	$\bar{D}^{*0} 3\pi^+ 2\pi^-$	$( 5.7 \pm 1.2 ) \times 10^{-3}$	
$\Gamma_{129}$	$D^*(2010)^+ \pi^0$	$< 3.6$	$\times 10^{-6}$
$\Gamma_{130}$	$D^*(2010)^+ K^0$	$< 9.0$	$\times 10^{-6}$ CL=90%
$\Gamma_{131}$	$D^*(2010)^- \pi^+ \pi^+ \pi^0$	$( 1.5 \pm 0.7 ) \%$	
$\Gamma_{132}$	$D^*(2010)^- \pi^+ \pi^+ \pi^+ \pi^-$	$( 2.6 \pm 0.4 ) \times 10^{-3}$	
$\Gamma_{133}$	$\bar{D}^{**0} \pi^+$	[e] $( 5.9 \pm 1.3 ) \times 10^{-3}$	
$\Gamma_{134}$	$\bar{D}_1^*(2420)^0 \pi^+$	$( 1.5 \pm 0.6 ) \times 10^{-3}$	S=1.3

$\Gamma_{135}$	$\bar{D}_1(2420)^0 \pi^+ \times B(\bar{D}_1^0 \rightarrow \bar{D}^0 \pi^+ \pi^-)$	$( 2.5 \pm 1.6 ) \times 10^{-4}$	S=4.0
$\Gamma_{136}$	$\bar{D}_1(2420)^0 \pi^+ \times B(\bar{D}_1^0 \rightarrow \bar{D}^0 \pi^+ \pi^- \text{ (nonresonant)})$	$( 2.3 \pm 1.0 ) \times 10^{-4}$	
$\Gamma_{137}$	$\bar{D}_2^*(2462)^0 \pi^+ \times B(\bar{D}_2^{*0}(2462)^0 \rightarrow D^- \pi^+)$	$( 3.5 \pm 0.4 ) \times 10^{-4}$	
$\Gamma_{138}$	$\bar{D}_2^*(2462)^0 \pi^+ \times B(\bar{D}_2^{*0} \rightarrow \bar{D}^0 \pi^- \pi^+)$	$( 2.3 \pm 1.1 ) \times 10^{-4}$	
$\Gamma_{139}$	$\bar{D}_2^*(2462)^0 \pi^+ \times B(\bar{D}_2^{*0} \rightarrow \bar{D}^0 \pi^- \pi^+ \text{ (nonresonant)})$	$< 1.7 \times 10^{-4}$	CL=90%
$\Gamma_{140}$	$\bar{D}_2^*(2462)^0 \pi^+ \times B(\bar{D}_2^{*0} \rightarrow D^*(2010)^- \pi^+)$	$( 2.2 \pm 1.1 ) \times 10^{-4}$	
$\Gamma_{141}$	$\bar{D}_0^*(2400)^0 \pi^+ \times B(\bar{D}_0^{*0}(2400)^0 \rightarrow D^- \pi^+)$	$( 6.4 \pm 1.4 ) \times 10^{-4}$	
$\Gamma_{142}$	$\bar{D}_1(2421)^0 \pi^+ \times B(\bar{D}_1(2421)^0 \rightarrow D^{*-} \pi^+)$	$( 6.8 \pm 1.5 ) \times 10^{-4}$	
$\Gamma_{143}$	$\bar{D}_2^*(2462)^0 \pi^+ \times B(\bar{D}_2^{*0}(2462)^0 \rightarrow D^{*-} \pi^+)$	$( 1.8 \pm 0.5 ) \times 10^{-4}$	
$\Gamma_{144}$	$\bar{D}'_1(2427)^0 \pi^+ \times B(\bar{D}'_1(2427)^0 \rightarrow D^{*-} \pi^+)$	$( 5.0 \pm 1.2 ) \times 10^{-4}$	
$\Gamma_{145}$	$\bar{D}_1(2420)^0 \pi^+ \times B(\bar{D}_1^0 \rightarrow \bar{D}^{*0} \pi^+ \pi^-)$	$< 6 \times 10^{-6}$	CL=90%
$\Gamma_{146}$	$\bar{D}_1^*(2420)^0 \rho^+$	$< 1.4 \times 10^{-3}$	CL=90%
$\Gamma_{147}$	$\bar{D}_2^*(2460)^0 \pi^+$	$< 1.3 \times 10^{-3}$	CL=90%
$\Gamma_{148}$	$\bar{D}_2^*(2460)^0 \pi^+ \times B(\bar{D}_2^{*0} \rightarrow \bar{D}^{*0} \pi^+ \pi^-)$	$< 2.2 \times 10^{-5}$	CL=90%
$\Gamma_{149}$	$\bar{D}_2^*(2460)^0 \rho^+$	$< 4.7 \times 10^{-3}$	CL=90%
$\Gamma_{150}$	$\bar{D}^0 D_s^+$	$( 9.0 \pm 0.9 ) \times 10^{-3}$	
$\Gamma_{151}$	$D_{s0}^*(2317)^+ \bar{D}^0, D_{s0}^{*+} \rightarrow D_s^+ \pi^0$	$( 7.9 \pm 1.5 ) \times 10^{-4}$	
$\Gamma_{152}$	$D_{s0}(2317)^+ \bar{D}^0 \times B(D_{s0}(2317)^+ \rightarrow D_s^{*+} \gamma)$	$< 7.6 \times 10^{-4}$	CL=90%
$\Gamma_{153}$	$D_{s0}(2317)^+ \bar{D}^*(2007)^0 \times B(D_{s0}(2317)^+ \rightarrow D_s^+ \pi^0)$	$( 9 \pm 7 ) \times 10^{-4}$	
$\Gamma_{154}$	$D_{sJ}(2457)^+ \bar{D}^0$	$( 3.1 \pm 1.0 ) \times 10^{-3}$	
$\Gamma_{155}$	$D_{sJ}(2457)^+ \bar{D}^0 \times B(D_{sJ}(2457)^+ \rightarrow D_s^+ \gamma)$	$( 4.6 \pm 1.3 ) \times 10^{-4}$	

$\Gamma_{156}$	$D_{sJ}(2457)^+ \bar{D}^0 \times$ $B(D_{sJ}(2457)^+ \rightarrow$ $D_s^+ \pi^+ \pi^-)$	$< 2.2$	$\times 10^{-4}$	CL=90%
$\Gamma_{157}$	$D_{sJ}(2457)^+ \bar{D}^0 \times$ $B(D_{sJ}(2457)^+ \rightarrow D_s^+ \pi^0)$	$< 2.7$	$\times 10^{-4}$	CL=90%
$\Gamma_{158}$	$D_{sJ}(2457)^+ \bar{D}^0 \times$ $B(D_{sJ}(2457)^+ \rightarrow D_s^{*+} \gamma)$	$< 9.8$	$\times 10^{-4}$	CL=90%
$\Gamma_{159}$	$D_{sJ}(2457)^+ \bar{D}^*(2007)^0$	$( 1.20 \pm 0.30 )$		%
$\Gamma_{160}$	$D_{sJ}(2457)^+ \bar{D}^*(2007)^0 \times$ $B(D_{sJ}(2457)^+ \rightarrow D_s^+ \gamma)$	$( 1.4 \begin{smallmatrix} + 0.7 \\ - 0.6 \end{smallmatrix} )$	$\times 10^{-3}$	
$\Gamma_{161}$	$\bar{D}^0 D_{s1}(2536)^+ \times$ $B(D_{s1}(2536)^+ \rightarrow$ $D^*(2007)^0 K^+ +$ $D^*(2010)^+ K^0)$	$( 4.0 \pm 1.0 )$	$\times 10^{-4}$	
$\Gamma_{162}$	$\bar{D}^0 D_{s1}(2536)^+ \times$ $B(D_{s1}(2536)^+ \rightarrow$ $D^*(2007)^0 K^+)$	$( 2.2 \pm 0.7 )$	$\times 10^{-4}$	
$\Gamma_{163}$	$\bar{D}^*(2007)^0 D_{s1}(2536)^+ \times$ $B(D_{s1}(2536)^+ \rightarrow$ $D^*(2007)^0 K^+)$	$( 5.5 \pm 1.6 )$	$\times 10^{-4}$	
$\Gamma_{164}$	$\bar{D}^0 D_{s1}(2536)^+ \times$ $B(D_{s1}(2536)^+ \rightarrow D^{*+} K^0)$	$( 2.3 \pm 1.1 )$	$\times 10^{-4}$	
$\Gamma_{165}$	$\bar{D}^0 D_{sJ}(2700)^+ \times$ $B(D_{sJ}(2700)^+ \rightarrow D^0 K^+)$	$( 5.6 \pm 1.8 )$	$\times 10^{-4}$	S=1.7
$\Gamma_{166}$	$\bar{D}^{*0} D_{s1}(2536)^+, D_{s1}^+ \rightarrow$ $D^{*+} K^0$	$( 3.9 \pm 2.6 )$	$\times 10^{-4}$	
$\Gamma_{167}$	$\bar{D}^0 D_{sJ}(2573)^+, D_{sJ}^+ \rightarrow$ $D^0 K^+$	$( 8 \pm 15 )$	$\times 10^{-6}$	
$\Gamma_{168}$	$\bar{D}^{*0} D_{sJ}(2573), D_{sJ}^+ \rightarrow D^0 K^+$	$< 2$	$\times 10^{-4}$	CL=90%
$\Gamma_{169}$	$\bar{D}^*(2007)^0 D_{sJ}(2573), D_{sJ}^+ \rightarrow$ $D^0 K^+$	$< 5$	$\times 10^{-4}$	CL=90%
$\Gamma_{170}$	$\bar{D}^0 D_s^{*+}$	$( 7.6 \pm 1.6 )$	$\times 10^{-3}$	
$\Gamma_{171}$	$\bar{D}^*(2007)^0 D_s^+$	$( 8.2 \pm 1.7 )$	$\times 10^{-3}$	
$\Gamma_{172}$	$\bar{D}^*(2007)^0 D_s^{*+}$	$( 1.71 \pm 0.24 )$		%
$\Gamma_{173}$	$D_s^{(*)+} \bar{D}^{*0}$	$( 2.7 \pm 1.2 )$		%
$\Gamma_{174}$	$\bar{D}^*(2007)^0 D^*(2010)^+$	$( 8.1 \pm 1.7 )$	$\times 10^{-4}$	
$\Gamma_{175}$	$\bar{D}^0 D^*(2010)^+ +$ $\bar{D}^*(2007)^0 D^+$	$< 1.30$		% CL=90%
$\Gamma_{176}$	$\bar{D}^0 D^*(2010)^+$	$( 3.9 \pm 0.5 )$	$\times 10^{-4}$	
$\Gamma_{177}$	$\bar{D}^0 D^+$	$( 3.8 \pm 0.4 )$	$\times 10^{-4}$	
$\Gamma_{178}$	$\bar{D}^0 D^+ K^0$	$( 1.55 \pm 0.21 )$	$\times 10^{-3}$	
$\Gamma_{179}$	$D^+ \bar{D}^*(2007)^0$	$( 6.3 \pm 1.7 )$	$\times 10^{-4}$	



$\Gamma_{180}$	$\bar{D}^*(2007)^0 D^+ K^0$	$( 2.1 \pm 0.5 ) \times 10^{-3}$	
$\Gamma_{181}$	$\bar{D}^0 D^*(2010)^+ K^0$	$( 3.8 \pm 0.4 ) \times 10^{-3}$	
$\Gamma_{182}$	$\bar{D}^*(2007)^0 D^*(2010)^+ K^0$	$( 9.2 \pm 1.2 ) \times 10^{-3}$	
$\Gamma_{183}$	$\bar{D}^0 D^0 K^+$	$( 1.45 \pm 0.33 ) \times 10^{-3}$	S=2.6
$\Gamma_{184}$	$\bar{D}^*(2007)^0 D^0 K^+$	$( 2.26 \pm 0.23 ) \times 10^{-3}$	
$\Gamma_{185}$	$\bar{D}^0 D^*(2007)^0 K^+$	$( 6.3 \pm 0.5 ) \times 10^{-3}$	
$\Gamma_{186}$	$\bar{D}^*(2007)^0 D^*(2007)^0 K^+$	$( 1.12 \pm 0.13 ) \%$	
$\Gamma_{187}$	$D^- D^+ K^+$	$( 2.2 \pm 0.7 ) \times 10^{-4}$	
$\Gamma_{188}$	$D^- D^*(2010)^+ K^+$	$( 6.3 \pm 1.1 ) \times 10^{-4}$	
$\Gamma_{189}$	$D^*(2010)^- D^+ K^+$	$( 6.0 \pm 1.3 ) \times 10^{-4}$	
$\Gamma_{190}$	$D^*(2010)^- D^*(2010)^+ K^+$	$( 1.32 \pm 0.18 ) \times 10^{-3}$	
$\Gamma_{191}$	$(\bar{D} + \bar{D}^*)(D + D^*)K$	$( 4.05 \pm 0.30 ) \%$	
$\Gamma_{192}$	$D_s^+ \pi^0$	$( 1.6 \pm 0.5 ) \times 10^{-5}$	
$\Gamma_{193}$	$D_s^{*+} \pi^0$	$< 2.6$	$\times 10^{-4}$ CL=90%
$\Gamma_{194}$	$D_s^+ \eta$	$< 4$	$\times 10^{-4}$ CL=90%
$\Gamma_{195}$	$D_s^{*+} \eta$	$< 6$	$\times 10^{-4}$ CL=90%
$\Gamma_{196}$	$D_s^+ \rho^0$	$< 3.0$	$\times 10^{-4}$ CL=90%
$\Gamma_{197}$	$D_s^{*+} \rho^0$	$< 4$	$\times 10^{-4}$ CL=90%
$\Gamma_{198}$	$D_s^+ \omega$	$< 4$	$\times 10^{-4}$ CL=90%
$\Gamma_{199}$	$D_s^{*+} \omega$	$< 6$	$\times 10^{-4}$ CL=90%
$\Gamma_{200}$	$D_s^+ a_1(1260)^0$	$< 1.8$	$\times 10^{-3}$ CL=90%
$\Gamma_{201}$	$D_s^{*+} a_1(1260)^0$	$< 1.3$	$\times 10^{-3}$ CL=90%
$\Gamma_{202}$	$D_s^+ \phi$	$( 1.7 \pm 1.2 ) \times 10^{-6}$	
$\Gamma_{203}$	$D_s^{*+} \phi$	$< 1.2$	$\times 10^{-5}$ CL=90%
$\Gamma_{204}$	$D_s^+ \bar{K}^0$	$< 8$	$\times 10^{-4}$ CL=90%
$\Gamma_{205}$	$D_s^{*+} \bar{K}^0$	$< 9$	$\times 10^{-4}$ CL=90%
$\Gamma_{206}$	$D_s^+ \bar{K}^*(892)^0$	$< 4.4$	$\times 10^{-6}$ CL=90%
$\Gamma_{207}$	$D_s^+ K^{*0}$	$< 3.5$	$\times 10^{-6}$ CL=90%
$\Gamma_{208}$	$D_s^{*+} \bar{K}^*(892)^0$	$< 3.5$	$\times 10^{-4}$ CL=90%
$\Gamma_{209}$	$D_s^- \pi^+ K^+$	$( 1.80 \pm 0.22 ) \times 10^{-4}$	
$\Gamma_{210}$	$D_s^{*-} \pi^+ K^+$	$( 1.45 \pm 0.24 ) \times 10^{-4}$	
$\Gamma_{211}$	$D_s^- \pi^+ K^*(892)^+$	$< 5$	$\times 10^{-3}$ CL=90%
$\Gamma_{212}$	$D_s^{*-} \pi^+ K^*(892)^+$	$< 7$	$\times 10^{-3}$ CL=90%
$\Gamma_{213}$	$D_s^- K^+ K^+$	$( 9.7 \pm 2.1 ) \times 10^{-6}$	
$\Gamma_{214}$	$D_s^{*-} K^+ K^+$	$< 1.5$	$\times 10^{-5}$ CL=90%

### Charmonium modes

$\Gamma_{215}$	$\eta_c K^+$	$( 9.6 \pm 1.1 ) \times 10^{-4}$	
$\Gamma_{216}$	$\eta_c K^+, \eta_c \rightarrow K_S^0 K^\mp \pi^\pm$	$( 2.7 \pm 0.6 ) \times 10^{-5}$	
$\Gamma_{217}$	$\eta_c K^*(892)^+$	$( 1.0 \pm 0.5 ) \times 10^{-3}$	
$\Gamma_{218}$	$\eta_c K^+ \pi^+ \pi^-$	$< 3.9$	$\times 10^{-4}$ CL=90%

$\Gamma_{219}$	$\eta_c K^+ \omega(782)$	$< 5.3$	$\times 10^{-4}$	CL=90%
$\Gamma_{220}$	$\eta_c K^+ \eta$	$< 2.2$	$\times 10^{-4}$	CL=90%
$\Gamma_{221}$	$\eta_c K^+ \pi^0$	$< 6.2$	$\times 10^{-5}$	CL=90%
$\Gamma_{222}$	$\eta_c(2S) K^+$	$( 3.4 \pm 1.8 )$	$\times 10^{-4}$	
$\Gamma_{223}$	$\eta_c(2S) K^+, \eta_c \rightarrow p \bar{p}$	$< 1.06$	$\times 10^{-7}$	CL=95%
$\Gamma_{224}$	$\eta_c(2S) K^+, \eta_c \rightarrow K_S^0 K^\mp \pi^\pm$	$( 3.4 \pm 2.3 \atop - 1.6 )$	$\times 10^{-6}$	
$\Gamma_{225}$	$h_c(1P) K^+, h_c \rightarrow J/\psi \pi^+ \pi^-$	$< 3.4$	$\times 10^{-6}$	CL=90%
$\Gamma_{226}$	$X(3730)^0 K^+, X^0 \rightarrow \eta_c \eta$	$< 4.6$	$\times 10^{-5}$	CL=90%
$\Gamma_{227}$	$X(3730)^0 K^+, X^0 \rightarrow \eta_c \pi^0$	$< 5.7$	$\times 10^{-6}$	CL=90%
$\Gamma_{228}$	$X(3872) K^+$	$< 3.2$	$\times 10^{-4}$	CL=90%
$\Gamma_{229}$	$X(3872) K^+, X \rightarrow p \bar{p}$	$< 1.7$	$\times 10^{-8}$	CL=95%
$\Gamma_{230}$	$X(3872) K^+, X \rightarrow J/\psi \pi^+ \pi^-$	$( 8.6 \pm 0.8 )$	$\times 10^{-6}$	
$\Gamma_{231}$	$X(3872) K^+, X \rightarrow J/\psi \gamma$	$( 2.1 \pm 0.4 )$	$\times 10^{-6}$	S=1.1
$\Gamma_{232}$	$X(3872) K^+, X \rightarrow \psi(2S) \gamma$	$( 4 \pm 4 )$	$\times 10^{-6}$	S=2.5
$\Gamma_{233}$	$X(3872) K^+, X \rightarrow J/\psi(1S) \eta$	$< 7.7$	$\times 10^{-6}$	CL=90%
$\Gamma_{234}$	$X(3872) K^+, X \rightarrow D^0 \bar{D}^0$	$< 6.0$	$\times 10^{-5}$	CL=90%
$\Gamma_{235}$	$X(3872) K^+, X \rightarrow D^+ D^-$	$< 4.0$	$\times 10^{-5}$	CL=90%
$\Gamma_{236}$	$X(3872) K^+, X \rightarrow D^0 \bar{D}^0 \pi^0$	$( 1.0 \pm 0.4 )$	$\times 10^{-4}$	
$\Gamma_{237}$	$X(3872) K^+, X \rightarrow \bar{D}^{*0} D^0$	$( 8.5 \pm 2.6 )$	$\times 10^{-5}$	S=1.4
$\Gamma_{238}$	$X(3872)^0 K^+, X^0 \rightarrow \eta_c \pi^+ \pi^-$	$< 3.0$	$\times 10^{-5}$	CL=90%
$\Gamma_{239}$	$X(3872)^0 K^+, X^0 \rightarrow \eta_c \omega(782)$	$< 6.9$	$\times 10^{-5}$	CL=90%
$\Gamma_{240}$	$X(3915)^0 K^+, X^0 \rightarrow \eta_c \eta$	$< 3.3$	$\times 10^{-5}$	CL=90%
$\Gamma_{241}$	$X(3915)^0 K^+, X^0 \rightarrow \eta_c \pi^0$	$< 1.8$	$\times 10^{-5}$	CL=90%
$\Gamma_{242}$	$X(4014)^0 K^+, X^0 \rightarrow \eta_c \eta$	$< 3.9$	$\times 10^{-5}$	CL=90%
$\Gamma_{243}$	$X(4014)^0 K^+, X^0 \rightarrow \eta_c \pi^0$	$< 1.2$	$\times 10^{-5}$	CL=90%
$\Gamma_{244}$	$X(3900)^0 K^+, X^0 \rightarrow \eta_c \pi^+ \pi^-$	$< 4.7$	$\times 10^{-5}$	CL=90%
$\Gamma_{245}$	$X(4020)^0 K^+, X^0 \rightarrow \eta_c \pi^+ \pi^-$	$< 1.6$	$\times 10^{-5}$	CL=90%
$\Gamma_{246}$	$X(3872) K^*(892)^+, X \rightarrow J/\psi \gamma$	$< 4.8$	$\times 10^{-6}$	CL=90%
$\Gamma_{247}$	$X(3872) K^*(892)^+, X \rightarrow \psi(2S) \gamma$	$< 2.8$	$\times 10^{-5}$	CL=90%
$\Gamma_{248}$	$X(3872)^+ K^0, X^+ \rightarrow J/\psi(1S) \pi^+ \pi^0$	[f] $< 6.1$	$\times 10^{-6}$	CL=90%
$\Gamma_{249}$	$X(3872) K^0 \pi^+, X \rightarrow J/\psi(1S) \pi^+ \pi^-$	$( 1.06 \pm 0.31 )$	$\times 10^{-5}$	
$\Gamma_{250}$	$X(4430)^+ K^0, X^+ \rightarrow J/\psi \pi^+$	$< 1.5$	$\times 10^{-5}$	CL=95%
$\Gamma_{251}$	$X(4430)^+ K^0, X^+ \rightarrow \psi(2S) \pi^+$	$< 4.7$	$\times 10^{-5}$	CL=95%
$\Gamma_{252}$	$X(4260)^0 K^+, X^0 \rightarrow J/\psi \pi^+ \pi^-$	$< 2.9$	$\times 10^{-5}$	CL=95%

Γ <sub>253</sub>	$X(3915)K^+$ , $X \rightarrow J/\psi\gamma$	< 1.4	$\times 10^{-5}$	CL=90%
Γ <sub>254</sub>	$X(3930)^0K^+$ , $X^0 \rightarrow J/\psi\gamma$	< 2.5	$\times 10^{-6}$	CL=90%
Γ <sub>255</sub>	$J/\psi(1S)K^+$	( 1.026 ± 0.031 )	$\times 10^{-3}$	
Γ <sub>256</sub>	$J/\psi(1S)K^0\pi^+$			
Γ <sub>257</sub>	$J/\psi(1S)K^+\pi^+\pi^-$	( 8.1 ± 1.3 )	$\times 10^{-4}$	S=2.5
Γ <sub>258</sub>	$J/\psi(1S)K^+K^-K^+$	( 3.37 ± 0.29 )	$\times 10^{-5}$	
Γ <sub>259</sub>	$X(3915)K^+$ , $X \rightarrow p\bar{p}$	< 7.1	$\times 10^{-8}$	CL=95%
Γ <sub>260</sub>	$J/\psi(1S)K^*(892)^+$	( 1.43 ± 0.08 )	$\times 10^{-3}$	
Γ <sub>261</sub>	$J/\psi(1S)K(1270)^+$	( 1.8 ± 0.5 )	$\times 10^{-3}$	
Γ <sub>262</sub>	$J/\psi(1S)K(1400)^+$	< 5	$\times 10^{-4}$	CL=90%
Γ <sub>263</sub>	$J/\psi(1S)\eta K^+$	( 1.24 ± 0.14 )	$\times 10^{-4}$	
Γ <sub>264</sub>	$X^{c-odd}(3872)K^+$ , $X^{c-odd} \rightarrow J/\psi\eta$	< 3.8	$\times 10^{-6}$	CL=90%
Γ <sub>265</sub>	$\psi(4160)K^+$ , $\psi \rightarrow J/\psi\eta$	< 7.4	$\times 10^{-6}$	CL=90%
Γ <sub>266</sub>	$J/\psi(1S)\eta'K^+$	< 8.8	$\times 10^{-5}$	CL=90%
Γ <sub>267</sub>	$J/\psi(1S)\phi K^+$	( 5.0 ± 0.4 )	$\times 10^{-5}$	
Γ <sub>268</sub>	$X(4140)K^+$ , $X \rightarrow$ $J/\psi(1S)\phi$	( 10 ± 4 )	$\times 10^{-6}$	
Γ <sub>269</sub>	$X(4274)K^+$ , $X \rightarrow$ $J/\psi(1S)\phi$	< 4	$\times 10^{-6}$	CL=90%
Γ <sub>270</sub>	$J/\psi(1S)\omega K^+$	( 3.20 $\begin{smallmatrix} + 0.60 \\ - 0.32 \end{smallmatrix}$ )	$\times 10^{-4}$	
Γ <sub>271</sub>	$X(3872)K^+$ , $X \rightarrow J/\psi\omega$	( 6.0 ± 2.2 )	$\times 10^{-6}$	
Γ <sub>272</sub>	$X(3915)K^+$ , $X \rightarrow J/\psi\omega$	( 3.0 $\begin{smallmatrix} + 0.9 \\ - 0.7 \end{smallmatrix}$ )	$\times 10^{-5}$	
Γ <sub>273</sub>	$J/\psi(1S)\pi^+$	( 4.1 ± 0.4 )	$\times 10^{-5}$	S=2.6
Γ <sub>274</sub>	$J/\psi(1S)\rho^+$	( 5.0 ± 0.8 )	$\times 10^{-5}$	
Γ <sub>275</sub>	$J/\psi(1S)\pi^+\pi^0$ nonresonant	< 7.3	$\times 10^{-6}$	CL=90%
Γ <sub>276</sub>	$J/\psi(1S)a_1(1260)^+$	< 1.2	$\times 10^{-3}$	CL=90%
Γ <sub>277</sub>	$J/\psi p\bar{p}\pi^+$	< 5.0	$\times 10^{-7}$	CL=90%
Γ <sub>278</sub>	$J/\psi(1S)p\bar{\Lambda}$	( 1.18 ± 0.31 )	$\times 10^{-5}$	
Γ <sub>279</sub>	$J/\psi(1S)\bar{\Sigma}^0 p$	< 1.1	$\times 10^{-5}$	CL=90%
Γ <sub>280</sub>	$J/\psi(1S)D^+$	< 1.2	$\times 10^{-4}$	CL=90%
Γ <sub>281</sub>	$J/\psi(1S)\bar{D}^0\pi^+$	< 2.5	$\times 10^{-5}$	CL=90%
Γ <sub>282</sub>	$\psi(2S)\pi^+$	( 2.44 ± 0.30 )	$\times 10^{-5}$	
Γ <sub>283</sub>	$\psi(2S)K^+$	( 6.26 ± 0.24 )	$\times 10^{-4}$	
Γ <sub>284</sub>	$\psi(2S)K^*(892)^+$	( 6.7 ± 1.4 )	$\times 10^{-4}$	S=1.3
Γ <sub>285</sub>	$\psi(2S)K^0\pi^+$			
Γ <sub>286</sub>	$\psi(2S)K^+\pi^+\pi^-$	( 4.3 ± 0.5 )	$\times 10^{-4}$	
Γ <sub>287</sub>	$\psi(3770)K^+$	( 4.9 ± 1.3 )	$\times 10^{-4}$	
Γ <sub>288</sub>	$\psi(3770)K^+, \psi \rightarrow D^0\bar{D}^0$	( 1.5 ± 0.5 )	$\times 10^{-4}$	S=1.4
Γ <sub>289</sub>	$\psi(3770)K^+, \psi \rightarrow D^+D^-$	( 9.4 ± 3.5 )	$\times 10^{-5}$	
Γ <sub>290</sub>	$\psi(4040)K^+$	< 1.3	$\times 10^{-4}$	CL=90%
Γ <sub>291</sub>	$\psi(4160)K^+$	( 5.1 ± 2.7 )	$\times 10^{-4}$	
Γ <sub>292</sub>	$\psi(4160)K^+, \psi \rightarrow \bar{D}^0D^0$	( 8 ± 5 )	$\times 10^{-5}$	

$\Gamma_{293}$	$\chi_{c0} \pi^+, \chi_{c0} \rightarrow \pi^+ \pi^-$	$< 1$	$\times 10^{-7}$	CL=90%
$\Gamma_{294}$	$\chi_{c0}(1P) K^+$	$( 1.50 \pm 0.15 )$	$\times 10^{-4}$	
$\Gamma_{295}$	$\chi_{c0} K^*(892)^+$	$< 2.1$	$\times 10^{-4}$	CL=90%
$\Gamma_{296}$	$\chi_{c2} \pi^+, \chi_{c2} \rightarrow \pi^+ \pi^-$	$< 1$	$\times 10^{-7}$	CL=90%
$\Gamma_{297}$	$\chi_{c2} K^+$	$( 1.1 \pm 0.4 )$	$\times 10^{-5}$	
$\Gamma_{298}$	$\chi_{c2} K^*(892)^+$	$< 1.2$	$\times 10^{-4}$	CL=90%
$\Gamma_{299}$	$\chi_{c1}(1P) \pi^+$	$( 2.2 \pm 0.5 )$	$\times 10^{-5}$	
$\Gamma_{300}$	$\chi_{c1}(1P) K^+$	$( 4.79 \pm 0.23 )$	$\times 10^{-4}$	
$\Gamma_{301}$	$\chi_{c1}(1P) K^0 \pi^+$			
$\Gamma_{302}$	$\chi_{c1}(1P) K^*(892)^+$	$( 3.0 \pm 0.6 )$	$\times 10^{-4}$	S=1.1
$\Gamma_{303}$	$h_c(1P) K^+$	$< 3.8$	$\times 10^{-5}$	CL=90%
$\Gamma_{304}$	$h_c(1P) K^+, h_c \rightarrow p \bar{p}$	$< 6.4$	$\times 10^{-8}$	CL=95%

**K or K\* modes**

$\Gamma_{305}$	$K^0 \pi^+$	$( 2.37 \pm 0.08 )$	$\times 10^{-5}$	
$\Gamma_{306}$	$K^+ \pi^0$	$( 1.29 \pm 0.05 )$	$\times 10^{-5}$	
$\Gamma_{307}$	$\eta' K^+$	$( 7.06 \pm 0.25 )$	$\times 10^{-5}$	
$\Gamma_{308}$	$\eta' K^*(892)^+$	$( 4.8 \pm 1.8 )$	$\times 10^{-6}$	
$\Gamma_{309}$	$\eta' K_0^*(1430)^+$	$( 5.2 \pm 2.1 )$	$\times 10^{-6}$	
$\Gamma_{310}$	$\eta' K_2^*(1430)^+$	$( 2.8 \pm 0.5 )$	$\times 10^{-5}$	
$\Gamma_{311}$	$\eta K^+$	$( 2.4 \pm 0.4 )$	$\times 10^{-6}$	S=1.7
$\Gamma_{312}$	$\eta K^*(892)^+$	$( 1.93 \pm 0.16 )$	$\times 10^{-5}$	
$\Gamma_{313}$	$\eta K_0^*(1430)^+$	$( 1.8 \pm 0.4 )$	$\times 10^{-5}$	
$\Gamma_{314}$	$\eta K_2^*(1430)^+$	$( 9.1 \pm 3.0 )$	$\times 10^{-6}$	
$\Gamma_{315}$	$\eta(1295) K^+ \times B(\eta(1295) \rightarrow \eta \pi \pi)$	$( 2.9 \pm 0.8 )$	$\times 10^{-6}$	
$\Gamma_{316}$	$\eta(1405) K^+ \times B(\eta(1405) \rightarrow \eta \pi \pi)$	$< 1.3$	$\times 10^{-6}$	CL=90%
$\Gamma_{317}$	$\eta(1405) K^+ \times B(\eta(1405) \rightarrow K^* K)$	$< 1.2$	$\times 10^{-6}$	CL=90%
$\Gamma_{318}$	$\eta(1475) K^+ \times B(\eta(1475) \rightarrow K^* K)$	$( 1.38 \pm 0.21 )$	$\times 10^{-5}$	
$\Gamma_{319}$	$f_1(1285) K^+$	$< 2.0$	$\times 10^{-6}$	CL=90%
$\Gamma_{320}$	$f_1(1420) K^+ \times B(f_1(1420) \rightarrow \eta \pi \pi)$	$< 2.9$	$\times 10^{-6}$	CL=90%
$\Gamma_{321}$	$f_1(1420) K^+ \times B(f_1(1420) \rightarrow K^* K)$	$< 4.1$	$\times 10^{-6}$	CL=90%
$\Gamma_{322}$	$\phi(1680) K^+ \times B(\phi(1680) \rightarrow K^* K)$	$< 3.4$	$\times 10^{-6}$	CL=90%
$\Gamma_{323}$	$f_0(1500) K^+$	$( 3.7 \pm 2.2 )$	$\times 10^{-6}$	
$\Gamma_{324}$	$\omega K^+$	$( 6.5 \pm 0.4 )$	$\times 10^{-6}$	
$\Gamma_{325}$	$\omega K^*(892)^+$	$< 7.4$	$\times 10^{-6}$	CL=90%

$\Gamma_{326}$	$\omega(K\pi)_0^{*+}$	$(2.8 \pm 0.4) \times 10^{-5}$
$\Gamma_{327}$	$\omega K_0^*(1430)^+$	$(2.4 \pm 0.5) \times 10^{-5}$
$\Gamma_{328}$	$\omega K_2^*(1430)^+$	$(2.1 \pm 0.4) \times 10^{-5}$
$\Gamma_{329}$	$a_0(980)^+ K^0 \times B(a_0(980)^+ \rightarrow \eta\pi^+)$	$< 3.9 \times 10^{-6}$ CL=90%
$\Gamma_{330}$	$a_0(980)^0 K^+ \times B(a_0(980)^0 \rightarrow \eta\pi^0)$	$< 2.5 \times 10^{-6}$ CL=90%
$\Gamma_{331}$	$K^*(892)^0 \pi^+$	$(1.01 \pm 0.09) \times 10^{-5}$
$\Gamma_{332}$	$K^*(892)^+ \pi^0$	$(8.2 \pm 1.9) \times 10^{-6}$
$\Gamma_{333}$	$K^+ \pi^- \pi^+$	$(5.10 \pm 0.29) \times 10^{-5}$
$\Gamma_{334}$	$K^+ \pi^- \pi^+$ nonresonant	$(1.63 \pm_{-0.15}^{+0.21}) \times 10^{-5}$
$\Gamma_{335}$	$\omega(782) K^+$	$(6 \pm 9) \times 10^{-6}$
$\Gamma_{336}$	$K^+ f_0(980) \times B(f_0(980) \rightarrow \pi^+ \pi^-)$	$(9.4 \pm_{-1.2}^{+1.0}) \times 10^{-6}$
$\Gamma_{337}$	$f_2(1270)^0 K^+$	$(1.07 \pm 0.27) \times 10^{-6}$
$\Gamma_{338}$	$f_0(1370)^0 K^+ \times B(f_0(1370)^0 \rightarrow \pi^+ \pi^-)$	$< 1.07 \times 10^{-5}$ CL=90%
$\Gamma_{339}$	$\rho^0(1450) K^+ \times B(\rho^0(1450) \rightarrow \pi^+ \pi^-)$	$< 1.17 \times 10^{-5}$ CL=90%
$\Gamma_{340}$	$f_2'(1525) K^+ \times B(f_2'(1525) \rightarrow \pi^+ \pi^-)$	$< 3.4 \times 10^{-6}$ CL=90%
$\Gamma_{341}$	$K^+ \rho^0$	$(3.7 \pm 0.5) \times 10^{-6}$
$\Gamma_{342}$	$K_0^*(1430)^0 \pi^+$	$(4.5 \pm_{-0.7}^{+0.9}) \times 10^{-5}$ S=1.5
$\Gamma_{343}$	$K_2^*(1430)^0 \pi^+$	$(5.6 \pm_{-1.5}^{+2.2}) \times 10^{-6}$
$\Gamma_{344}$	$K^*(1410)^0 \pi^+$	$< 4.5 \times 10^{-5}$ CL=90%
$\Gamma_{345}$	$K^*(1680)^0 \pi^+$	$< 1.2 \times 10^{-5}$ CL=90%
$\Gamma_{346}$	$K^+ \pi^0 \pi^0$	$(1.62 \pm 0.19) \times 10^{-5}$
$\Gamma_{347}$	$f_0(980) K^+ \times B(f_0 \rightarrow \pi^0 \pi^0)$	$(2.8 \pm 0.8) \times 10^{-6}$
$\Gamma_{348}$	$K^- \pi^+ \pi^+$	$< 9.5 \times 10^{-7}$ CL=90%
$\Gamma_{349}$	$K^- \pi^+ \pi^+$ nonresonant	$< 5.6 \times 10^{-5}$ CL=90%
$\Gamma_{350}$	$K_1(1270)^0 \pi^+$	$< 4.0 \times 10^{-5}$ CL=90%
$\Gamma_{351}$	$K_1(1400)^0 \pi^+$	$< 3.9 \times 10^{-5}$ CL=90%
$\Gamma_{352}$	$K^0 \pi^+ \pi^0$	$< 6.6 \times 10^{-5}$ CL=90%
$\Gamma_{353}$	$K^0 \rho^+$	$(8.0 \pm 1.5) \times 10^{-6}$
$\Gamma_{354}$	$K^*(892)^+ \pi^+ \pi^-$	$(7.5 \pm 1.0) \times 10^{-5}$
$\Gamma_{355}$	$K^*(892)^+ \rho^0$	$(4.6 \pm 1.1) \times 10^{-6}$
$\Gamma_{356}$	$K^*(892)^+ f_0(980)$	$(4.2 \pm 0.7) \times 10^{-6}$
$\Gamma_{357}$	$a_1^+ K^0$	$(3.5 \pm 0.7) \times 10^{-5}$
$\Gamma_{358}$	$b_1^+ K^0 \times B(b_1^+ \rightarrow \omega \pi^+)$	$(9.6 \pm 1.9) \times 10^{-6}$
$\Gamma_{359}$	$K^*(892)^0 \rho^+$	$(9.2 \pm 1.5) \times 10^{-6}$
$\Gamma_{360}$	$K_1(1400)^+ \rho^0$	$< 7.8 \times 10^{-4}$ CL=90%

$\Gamma_{361}$	$K_2^*(1430)^+ \rho^0$	$< 1.5$	$\times 10^{-3}$	CL=90%
$\Gamma_{362}$	$b_1^0 K^+ \times B(b_1^0 \rightarrow \omega \pi^0)$	$( 9.1 \pm 2.0 )$	$\times 10^{-6}$	
$\Gamma_{363}$	$b_1^+ K^{*0} \times B(b_1^+ \rightarrow \omega \pi^+)$	$< 5.9$	$\times 10^{-6}$	CL=90%
$\Gamma_{364}$	$b_1^0 K^{*+} \times B(b_1^0 \rightarrow \omega \pi^0)$	$< 6.7$	$\times 10^{-6}$	CL=90%
$\Gamma_{365}$	$K^+ \bar{K}^0$	$( 1.31 \pm 0.17 )$	$\times 10^{-6}$	S=1.2
$\Gamma_{366}$	$\bar{K}^0 K^+ \pi^0$	$< 2.4$	$\times 10^{-5}$	CL=90%
$\Gamma_{367}$	$K^+ K_S^0 K_S^0$	$( 1.08 \pm 0.06 )$	$\times 10^{-5}$	
$\Gamma_{368}$	$f_0(980) K^+, f_0 \rightarrow K_S^0 K_S^0$	$( 1.47 \pm 0.33 )$	$\times 10^{-5}$	
$\Gamma_{369}$	$f_0(1710) K^+, f_0 \rightarrow K_S^0 K_S^0$	$( 4.8 \begin{smallmatrix} + 4.0 \\ - 2.6 \end{smallmatrix} )$	$\times 10^{-7}$	
$\Gamma_{370}$	$K^+ K_S^0 K_S^0$ nonresonant	$( 2.0 \pm 0.4 )$	$\times 10^{-5}$	
$\Gamma_{371}$	$K_S^0 K_S^0 \pi^+$	$< 5.1$	$\times 10^{-7}$	CL=90%
$\Gamma_{372}$	$K^+ K^- \pi^+$	$( 5.0 \pm 0.7 )$	$\times 10^{-6}$	
$\Gamma_{373}$	$K^+ K^- \pi^+$ nonresonant	$< 7.5$	$\times 10^{-5}$	CL=90%
$\Gamma_{374}$	$K^+ \bar{K}^*(892)^0$	$< 1.1$	$\times 10^{-6}$	CL=90%
$\Gamma_{375}$	$K^+ \bar{K}_0^*(1430)^0$	$< 2.2$	$\times 10^{-6}$	CL=90%
$\Gamma_{376}$	$K^+ K^+ \pi^-$	$< 1.6$	$\times 10^{-7}$	CL=90%
$\Gamma_{377}$	$K^+ K^+ \pi^-$ nonresonant	$< 8.79$	$\times 10^{-5}$	CL=90%
$\Gamma_{378}$	$f_2'(1525) K^+$	$( 1.8 \pm 0.5 )$	$\times 10^{-6}$	S=1.1
$\Gamma_{379}$	$K^+ f_J(2220)$			
$\Gamma_{380}$	$K^{*+} \pi^+ K^-$	$< 1.18$	$\times 10^{-5}$	CL=90%
$\Gamma_{381}$	$K^*(892)^+ K^*(892)^0$	$( 9.1 \pm 2.9 )$	$\times 10^{-7}$	
$\Gamma_{382}$	$K^{*+} K^+ \pi^-$	$< 6.1$	$\times 10^{-6}$	CL=90%
$\Gamma_{383}$	$K^+ K^- K^+$	$( 3.40 \pm 0.14 )$	$\times 10^{-5}$	S=1.4
$\Gamma_{384}$	$K^+ \phi$	$( 8.8 \begin{smallmatrix} + 0.7 \\ - 0.6 \end{smallmatrix} )$	$\times 10^{-6}$	S=1.1
$\Gamma_{385}$	$f_0(980) K^+ \times B(f_0(980) \rightarrow K^+ K^-)$	$( 9.4 \pm 3.2 )$	$\times 10^{-6}$	
$\Gamma_{386}$	$a_2(1320) K^+ \times B(a_2(1320) \rightarrow K^+ K^-)$	$< 1.1$	$\times 10^{-6}$	CL=90%
$\Gamma_{387}$	$X_0(1550) K^+ \times B(X_0(1550) \rightarrow K^+ K^-)$	$( 4.3 \pm 0.7 )$	$\times 10^{-6}$	
$\Gamma_{388}$	$\phi(1680) K^+ \times B(\phi(1680) \rightarrow K^+ K^-)$	$< 8$	$\times 10^{-7}$	CL=90%
$\Gamma_{389}$	$f_0(1710) K^+ \times B(f_0(1710) \rightarrow K^+ K^-)$	$( 1.1 \pm 0.6 )$	$\times 10^{-6}$	
$\Gamma_{390}$	$K^+ K^- K^+$ nonresonant	$( 2.38 \begin{smallmatrix} + 0.28 \\ - 0.50 \end{smallmatrix} )$	$\times 10^{-5}$	
$\Gamma_{391}$	$K^*(892)^+ K^+ K^-$	$( 3.6 \pm 0.5 )$	$\times 10^{-5}$	
$\Gamma_{392}$	$K^*(892)^+ \phi$	$( 10.0 \pm 2.0 )$	$\times 10^{-6}$	S=1.7
$\Gamma_{393}$	$\phi(K\pi)_0^{*+}$	$( 8.3 \pm 1.6 )$	$\times 10^{-6}$	
$\Gamma_{394}$	$\phi K_1(1270)^+$	$( 6.1 \pm 1.9 )$	$\times 10^{-6}$	
$\Gamma_{395}$	$\phi K_1(1400)^+$	$< 3.2$	$\times 10^{-6}$	CL=90%
$\Gamma_{396}$	$\phi K^*(1410)^+$	$< 4.3$	$\times 10^{-6}$	CL=90%

$\Gamma_{397}$	$\phi K_0^*(1430)^+$	$( 7.0 \pm 1.6 ) \times 10^{-6}$
$\Gamma_{398}$	$\phi K_2^*(1430)^+$	$( 8.4 \pm 2.1 ) \times 10^{-6}$
$\Gamma_{399}$	$\phi K_2^*(1770)^+$	$< 1.50 \times 10^{-5}$ CL=90%
$\Gamma_{400}$	$\phi K_2^*(1820)^+$	$< 1.63 \times 10^{-5}$ CL=90%
$\Gamma_{401}$	$a_1^+ K^{*0}$	$< 3.6 \times 10^{-6}$ CL=90%
$\Gamma_{402}$	$K^+ \phi \phi$	$( 5.0 \pm 1.2 ) \times 10^{-6}$ S=2.3
$\Gamma_{403}$	$\eta' \eta' K^+$	$< 2.5 \times 10^{-5}$ CL=90%
$\Gamma_{404}$	$\omega \phi K^+$	$< 1.9 \times 10^{-6}$ CL=90%
$\Gamma_{405}$	$X(1812) K^+ \times B(X \rightarrow \omega \phi)$	$< 3.2 \times 10^{-7}$ CL=90%
$\Gamma_{406}$	$K^*(892)^+ \gamma$	$( 4.21 \pm 0.18 ) \times 10^{-5}$
$\Gamma_{407}$	$K_1(1270)^+ \gamma$	$( 4.3 \pm 1.3 ) \times 10^{-5}$
$\Gamma_{408}$	$\eta K^+ \gamma$	$( 7.9 \pm 0.9 ) \times 10^{-6}$
$\Gamma_{409}$	$\eta' K^+ \gamma$	$( 2.9 \begin{smallmatrix} + 1.0 \\ - 0.9 \end{smallmatrix} ) \times 10^{-6}$
$\Gamma_{410}$	$\phi K^+ \gamma$	$( 2.7 \pm 0.4 ) \times 10^{-6}$ S=1.2
$\Gamma_{411}$	$K^+ \pi^- \pi^+ \gamma$	$( 2.76 \pm 0.22 ) \times 10^{-5}$ S=1.2
$\Gamma_{412}$	$K^*(892)^0 \pi^+ \gamma$	$( 2.0 \begin{smallmatrix} + 0.7 \\ - 0.6 \end{smallmatrix} ) \times 10^{-5}$
$\Gamma_{413}$	$K^+ \rho^0 \gamma$	$< 2.0 \times 10^{-5}$ CL=90%
$\Gamma_{414}$	$K^+ \pi^- \pi^+ \gamma$ nonresonant	$< 9.2 \times 10^{-6}$ CL=90%
$\Gamma_{415}$	$K^0 \pi^+ \pi^0 \gamma$	$( 4.6 \pm 0.5 ) \times 10^{-5}$
$\Gamma_{416}$	$K_1(1400)^+ \gamma$	$< 1.5 \times 10^{-5}$ CL=90%
$\Gamma_{417}$	$K_2^*(1430)^+ \gamma$	$( 1.4 \pm 0.4 ) \times 10^{-5}$
$\Gamma_{418}$	$K^*(1680)^+ \gamma$	$< 1.9 \times 10^{-3}$ CL=90%
$\Gamma_{419}$	$K_3^*(1780)^+ \gamma$	$< 3.9 \times 10^{-5}$ CL=90%
$\Gamma_{420}$	$K_4^*(2045)^+ \gamma$	$< 9.9 \times 10^{-3}$ CL=90%

### Light unflavored meson modes

$\Gamma_{421}$	$\rho^+ \gamma$	$( 9.8 \pm 2.5 ) \times 10^{-7}$
$\Gamma_{422}$	$\pi^+ \pi^0$	$( 5.5 \pm 0.4 ) \times 10^{-6}$ S=1.2
$\Gamma_{423}$	$\pi^+ \pi^+ \pi^-$	$( 1.52 \pm 0.14 ) \times 10^{-5}$
$\Gamma_{424}$	$\rho^0 \pi^+$	$( 8.3 \pm 1.2 ) \times 10^{-6}$
$\Gamma_{425}$	$\pi^+ f_0(980), f_0 \rightarrow \pi^+ \pi^-$	$< 1.5 \times 10^{-6}$ CL=90%
$\Gamma_{426}$	$\pi^+ f_2(1270)$	$( 1.6 \begin{smallmatrix} + 0.7 \\ - 0.4 \end{smallmatrix} ) \times 10^{-6}$
$\Gamma_{427}$	$\rho(1450)^0 \pi^+, \rho^0 \rightarrow \pi^+ \pi^-$	$( 1.4 \begin{smallmatrix} + 0.6 \\ - 0.9 \end{smallmatrix} ) \times 10^{-6}$
$\Gamma_{428}$	$f_0(1370) \pi^+, f_0 \rightarrow \pi^+ \pi^-$	$< 4.0 \times 10^{-6}$ CL=90%
$\Gamma_{429}$	$f_0(500) \pi^+, f_0 \rightarrow \pi^+ \pi^-$	$< 4.1 \times 10^{-6}$ CL=90%
$\Gamma_{430}$	$\pi^+ \pi^- \pi^+$ nonresonant	$( 5.3 \begin{smallmatrix} + 1.5 \\ - 1.1 \end{smallmatrix} ) \times 10^{-6}$
$\Gamma_{431}$	$\pi^+ \pi^0 \pi^0$	$< 8.9 \times 10^{-4}$ CL=90%
$\Gamma_{432}$	$\rho^+ \pi^0$	$( 1.09 \pm 0.14 ) \times 10^{-5}$
$\Gamma_{433}$	$\pi^+ \pi^- \pi^+ \pi^0$	$< 4.0 \times 10^{-3}$ CL=90%
$\Gamma_{434}$	$\rho^+ \rho^0$	$( 2.40 \pm 0.19 ) \times 10^{-5}$
$\Gamma_{435}$	$\rho^+ f_0(980), f_0 \rightarrow \pi^+ \pi^-$	$< 2.0 \times 10^{-6}$ CL=90%

$\Gamma_{436}$	$a_1(1260)^+ \pi^0$	$( 2.6 \pm 0.7 ) \times 10^{-5}$	
$\Gamma_{437}$	$a_1(1260)^0 \pi^+$	$( 2.0 \pm 0.6 ) \times 10^{-5}$	
$\Gamma_{438}$	$\omega \pi^+$	$( 6.9 \pm 0.5 ) \times 10^{-6}$	
$\Gamma_{439}$	$\omega \rho^+$	$( 1.59 \pm 0.21 ) \times 10^{-5}$	
$\Gamma_{440}$	$\eta \pi^+$	$( 4.02 \pm 0.27 ) \times 10^{-6}$	
$\Gamma_{441}$	$\eta \rho^+$	$( 7.0 \pm 2.9 ) \times 10^{-6}$	S=2.8
$\Gamma_{442}$	$\eta' \pi^+$	$( 2.7 \pm 0.9 ) \times 10^{-6}$	S=1.9
$\Gamma_{443}$	$\eta' \rho^+$	$( 9.7 \pm 2.2 ) \times 10^{-6}$	
$\Gamma_{444}$	$\phi \pi^+$	$< 1.5$	$\times 10^{-7}$ CL=90%
$\Gamma_{445}$	$\phi \rho^+$	$< 3.0$	$\times 10^{-6}$ CL=90%
$\Gamma_{446}$	$a_0(980)^0 \pi^+, a_0^0 \rightarrow \eta \pi^0$	$< 5.8$	$\times 10^{-6}$ CL=90%
$\Gamma_{447}$	$a_0(980)^+ \pi^0, a_0^+ \rightarrow \eta \pi^+$	$< 1.4$	$\times 10^{-6}$ CL=90%
$\Gamma_{448}$	$\pi^+ \pi^+ \pi^+ \pi^- \pi^-$	$< 8.6$	$\times 10^{-4}$ CL=90%
$\Gamma_{449}$	$\rho^0 a_1(1260)^+$	$< 6.2$	$\times 10^{-4}$ CL=90%
$\Gamma_{450}$	$\rho^0 a_2(1320)^+$	$< 7.2$	$\times 10^{-4}$ CL=90%
$\Gamma_{451}$	$b_1^0 \pi^+, b_1^0 \rightarrow \omega \pi^0$	$( 6.7 \pm 2.0 ) \times 10^{-6}$	
$\Gamma_{452}$	$b_1^+ \pi^0, b_1^+ \rightarrow \omega \pi^+$	$< 3.3$	$\times 10^{-6}$ CL=90%
$\Gamma_{453}$	$\pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^0$	$< 6.3$	$\times 10^{-3}$ CL=90%
$\Gamma_{454}$	$b_1^+ \rho^0, b_1^+ \rightarrow \omega \pi^+$	$< 5.2$	$\times 10^{-6}$ CL=90%
$\Gamma_{455}$	$a_1(1260)^+ a_1(1260)^0$	$< 1.3$	% CL=90%
$\Gamma_{456}$	$b_1^0 \rho^+, b_1^0 \rightarrow \omega \pi^0$	$< 3.3$	$\times 10^{-6}$ CL=90%

### Charged particle ( $h^\pm$ ) modes

$$h^\pm = K^\pm \text{ or } \pi^\pm$$

$\Gamma_{457}$	$h^+ \pi^0$	$( 1.6 \pm_{-0.6}^{0.7} ) \times 10^{-5}$	
$\Gamma_{458}$	$\omega h^+$	$( 1.38 \pm_{-0.24}^{0.27} ) \times 10^{-5}$	
$\Gamma_{459}$	$h^+ X^0$ (Familon)	$< 4.9$	$\times 10^{-5}$ CL=90%

### Baryon modes

$\Gamma_{460}$	$p \bar{p} \pi^+$	$( 1.62 \pm 0.20 ) \times 10^{-6}$	
$\Gamma_{461}$	$p \bar{p} \pi^+$ nonresonant	$< 5.3$	$\times 10^{-5}$ CL=90%
$\Gamma_{462}$	$p \bar{p} \pi^+ \pi^+ \pi^-$		
$\Gamma_{463}$	$p \bar{p} K^+$	$( 5.9 \pm 0.5 ) \times 10^{-6}$	S=1.5
$\Gamma_{464}$	$\Theta(1710)^{++} \bar{p}, \Theta^{++} \rightarrow p K^+$	[g] $< 9.1$	$\times 10^{-8}$ CL=90%
$\Gamma_{465}$	$f_J(2220) K^+, f_J \rightarrow p \bar{p}$	[g] $< 4.1$	$\times 10^{-7}$ CL=90%
$\Gamma_{466}$	$p \bar{\Lambda}(1520)$	$( 3.1 \pm 0.6 ) \times 10^{-7}$	
$\Gamma_{467}$	$p \bar{p} K^+$ nonresonant	$< 8.9$	$\times 10^{-5}$ CL=90%
$\Gamma_{468}$	$p \bar{p} K^*(892)^+$	$( 3.6 \pm_{-0.7}^{0.8} ) \times 10^{-6}$	
$\Gamma_{469}$	$f_J(2220) K^{*+}, f_J \rightarrow p \bar{p}$	$< 7.7$	$\times 10^{-7}$ CL=90%
$\Gamma_{470}$	$p \bar{\Lambda}$	$< 3.2$	$\times 10^{-7}$ CL=90%
$\Gamma_{471}$	$p \bar{\Lambda} \gamma$	$( 2.4 \pm_{-0.4}^{0.5} ) \times 10^{-6}$	



$\Gamma_{472}$	$\rho\bar{\Lambda}\pi^0$	$( 3.0 \begin{smallmatrix} + \\ - \end{smallmatrix} \begin{smallmatrix} 0.7 \\ 0.6 \end{smallmatrix} ) \times 10^{-6}$
$\Gamma_{473}$	$\rho\bar{\Sigma}(1385)^0$	$< 4.7 \times 10^{-7}$ CL=90%
$\Gamma_{474}$	$\Delta^+\bar{\Lambda}$	$< 8.2 \times 10^{-7}$ CL=90%
$\Gamma_{475}$	$\rho\bar{\Sigma}\gamma$	$< 4.6 \times 10^{-6}$ CL=90%
$\Gamma_{476}$	$\rho\bar{\Lambda}\pi^+\pi^-$	$( 5.9 \pm 1.1 ) \times 10^{-6}$
$\Gamma_{477}$	$\rho\bar{\Lambda}\rho^0$	$( 4.8 \pm 0.9 ) \times 10^{-6}$
$\Gamma_{478}$	$\rho\bar{\Lambda}f_2(1270)$	$( 2.0 \pm 0.8 ) \times 10^{-6}$
$\Gamma_{479}$	$\Lambda\bar{\Lambda}\pi^+$	$< 9.4 \times 10^{-7}$ CL=90%
$\Gamma_{480}$	$\Lambda\bar{\Lambda}K^+$	$( 3.4 \pm 0.6 ) \times 10^{-6}$
$\Gamma_{481}$	$\Lambda\bar{\Lambda}K^{*+}$	$( 2.2 \begin{smallmatrix} + \\ - \end{smallmatrix} \begin{smallmatrix} 1.2 \\ 0.9 \end{smallmatrix} ) \times 10^{-6}$
$\Gamma_{482}$	$\bar{\Delta}^0\rho$	$< 1.38 \times 10^{-6}$ CL=90%
$\Gamma_{483}$	$\Delta^{++}\bar{p}$	$< 1.4 \times 10^{-7}$ CL=90%
$\Gamma_{484}$	$D^+\rho\bar{p}$	$< 1.5 \times 10^{-5}$ CL=90%
$\Gamma_{485}$	$D^*(2010)^+\rho\bar{p}$	$< 1.5 \times 10^{-5}$ CL=90%
$\Gamma_{486}$	$\bar{D}^0\rho\bar{p}\pi^+$	$( 3.72 \pm 0.27 ) \times 10^{-4}$
$\Gamma_{487}$	$\bar{D}^{*0}\rho\bar{p}\pi^+$	$( 3.73 \pm 0.32 ) \times 10^{-4}$
$\Gamma_{488}$	$D^-\rho\bar{p}\pi^+\pi^-$	$( 1.66 \pm 0.30 ) \times 10^{-4}$
$\Gamma_{489}$	$D^{*-}\rho\bar{p}\pi^+\pi^-$	$( 1.86 \pm 0.25 ) \times 10^{-4}$
$\Gamma_{490}$	$\rho\bar{\Lambda}^0\bar{D}^0$	$( 1.43 \pm 0.32 ) \times 10^{-5}$
$\Gamma_{491}$	$\rho\bar{\Lambda}^0\bar{D}^*(2007)^0$	$< 5 \times 10^{-5}$ CL=90%
$\Gamma_{492}$	$\bar{\Lambda}_c^-\rho\pi^+$	$( 2.2 \pm 0.4 ) \times 10^{-4}$ S=2.2
$\Gamma_{493}$	$\bar{\Lambda}_c^-\Delta(1232)^{++}$	$< 1.9 \times 10^{-5}$ CL=90%
$\Gamma_{494}$	$\bar{\Lambda}_c^-\Delta_X(1600)^{++}$	$( 4.6 \pm 0.9 ) \times 10^{-5}$
$\Gamma_{495}$	$\bar{\Lambda}_c^-\Delta_X(2420)^{++}$	$( 3.7 \pm 0.8 ) \times 10^{-5}$
$\Gamma_{496}$	$(\bar{\Lambda}_c^-\rho)_s\pi^+$	[h] $( 3.1 \pm 0.7 ) \times 10^{-5}$
$\Gamma_{497}$	$\bar{\Sigma}_c(2520)^0\rho$	$< 3 \times 10^{-6}$ CL=90%
$\Gamma_{498}$	$\bar{\Sigma}_c(2800)^0\rho$	$( 2.6 \pm 0.9 ) \times 10^{-5}$
$\Gamma_{499}$	$\bar{\Lambda}_c^-\rho\pi^+\pi^0$	$( 1.8 \pm 0.6 ) \times 10^{-3}$
$\Gamma_{500}$	$\bar{\Lambda}_c^-\rho\pi^+\pi^+\pi^-$	$( 2.2 \pm 0.7 ) \times 10^{-3}$
$\Gamma_{501}$	$\bar{\Lambda}_c^-\rho\pi^+\pi^+\pi^-\pi^0$	$< 1.34 \%$ CL=90%
$\Gamma_{502}$	$\Lambda_c^+\Lambda_c^-K^+$	$( 6.9 \pm 2.2 ) \times 10^{-4}$
$\Gamma_{503}$	$\bar{\Sigma}_c(2455)^0\rho$	$( 2.9 \pm 0.7 ) \times 10^{-5}$
$\Gamma_{504}$	$\bar{\Sigma}_c(2455)^0\rho\pi^0$	$( 3.5 \pm 1.1 ) \times 10^{-4}$
$\Gamma_{505}$	$\bar{\Sigma}_c(2455)^0\rho\pi^-\pi^+$	$( 3.5 \pm 1.0 ) \times 10^{-4}$
$\Gamma_{506}$	$\bar{\Sigma}_c(2455)^{--}\rho\pi^+\pi^+$	$( 2.34 \pm 0.20 ) \times 10^{-4}$
$\Gamma_{507}$	$\bar{\Lambda}_c(2593)^-/\bar{\Lambda}_c(2625)^-\rho\pi^+$	$< 1.9 \times 10^{-4}$ CL=90%
$\Gamma_{508}$	$\Xi_c^0\Lambda_c^+, \Xi_c^0 \rightarrow \Xi^+\pi^-$	$( 2.4 \pm 0.9 ) \times 10^{-5}$ S=1.4
$\Gamma_{509}$	$\Xi_c^0\Lambda_c^+, \Xi_c^0 \rightarrow \Lambda K^+\pi^-$	$( 2.1 \pm 0.9 ) \times 10^{-5}$ S=1.5

**Lepton Family number ( $LF$ ) or Lepton number ( $L$ ) or Baryon number ( $B$ )  
violating modes, or/and  $\Delta B = 1$  weak neutral current ( $B1$ ) modes**

$\Gamma_{510}$	$\pi^+ \ell^+ \ell^-$	$B1$	$< 4.9$	$\times 10^{-8}$	CL=90%
$\Gamma_{511}$	$\pi^+ e^+ e^-$	$B1$	$< 8.0$	$\times 10^{-8}$	CL=90%
$\Gamma_{512}$	$\pi^+ \mu^+ \mu^-$	$B1$	$( 1.79 \pm 0.23 )$	$\times 10^{-8}$	
$\Gamma_{513}$	$\pi^+ \nu \bar{\nu}$	$B1$	$< 9.8$	$\times 10^{-5}$	CL=90%
$\Gamma_{514}$	$K^+ \ell^+ \ell^-$	$B1$	[a] $( 4.51 \pm 0.23 )$	$\times 10^{-7}$	S=1.1
$\Gamma_{515}$	$K^+ e^+ e^-$	$B1$	$( 5.5 \pm 0.7 )$	$\times 10^{-7}$	
$\Gamma_{516}$	$K^+ \mu^+ \mu^-$	$B1$	$( 4.43 \pm 0.24 )$	$\times 10^{-7}$	S=1.2
$\Gamma_{517}$	$K^+ \bar{\nu} \nu$	$B1$	$< 1.6$	$\times 10^{-5}$	CL=90%
$\Gamma_{518}$	$\rho^+ \nu \bar{\nu}$	$B1$	$< 2.13$	$\times 10^{-4}$	CL=90%
$\Gamma_{519}$	$K^*(892)^+ \ell^+ \ell^-$	$B1$	[a] $( 1.01 \pm 0.11 )$	$\times 10^{-6}$	S=1.1
$\Gamma_{520}$	$K^*(892)^+ e^+ e^-$	$B1$	$( 1.55 \begin{smallmatrix} + 0.40 \\ - 0.31 \end{smallmatrix} )$	$\times 10^{-6}$	
$\Gamma_{521}$	$K^*(892)^+ \mu^+ \mu^-$	$B1$	$( 9.6 \pm 1.0 )$	$\times 10^{-7}$	
$\Gamma_{522}$	$K^*(892)^+ \nu \bar{\nu}$	$B1$	$< 4.0$	$\times 10^{-5}$	CL=90%
$\Gamma_{523}$	$K^+ \pi^+ \pi^- \mu^+ \mu^-$	$B1$	$( 4.4 \pm 0.4 )$	$\times 10^{-7}$	
$\Gamma_{524}$	$\phi K^+ \mu^+ \mu^-$	$B1$	$( 7.9 \begin{smallmatrix} + 2.1 \\ - 1.7 \end{smallmatrix} )$	$\times 10^{-8}$	
$\Gamma_{525}$	$\pi^+ e^+ \mu^-$	$LF$	$< 6.4$	$\times 10^{-3}$	CL=90%
$\Gamma_{526}$	$\pi^+ e^- \mu^+$	$LF$	$< 6.4$	$\times 10^{-3}$	CL=90%
$\Gamma_{527}$	$\pi^+ e^\pm \mu^\mp$	$LF$	$< 1.7$	$\times 10^{-7}$	CL=90%
$\Gamma_{528}$	$\pi^+ e^+ \tau^-$	$LF$	$< 7.4$	$\times 10^{-5}$	CL=90%
$\Gamma_{529}$	$\pi^+ e^- \tau^+$	$LF$	$< 2.0$	$\times 10^{-5}$	CL=90%
$\Gamma_{530}$	$\pi^+ e^\pm \tau^\mp$	$LF$	$< 7.5$	$\times 10^{-5}$	CL=90%
$\Gamma_{531}$	$\pi^+ \mu^+ \tau^-$	$LF$	$< 6.2$	$\times 10^{-5}$	CL=90%
$\Gamma_{532}$	$\pi^+ \mu^- \tau^+$	$LF$	$< 4.5$	$\times 10^{-5}$	CL=90%
$\Gamma_{533}$	$\pi^+ \mu^\pm \tau^\mp$	$LF$	$< 7.2$	$\times 10^{-5}$	CL=90%
$\Gamma_{534}$	$K^+ e^+ \mu^-$	$LF$	$< 9.1$	$\times 10^{-8}$	CL=90%
$\Gamma_{535}$	$K^+ e^- \mu^+$	$LF$	$< 1.3$	$\times 10^{-7}$	CL=90%
$\Gamma_{536}$	$K^+ e^\pm \mu^\mp$	$LF$	$< 9.1$	$\times 10^{-8}$	CL=90%
$\Gamma_{537}$	$K^+ e^+ \tau^-$	$LF$	$< 4.3$	$\times 10^{-5}$	CL=90%
$\Gamma_{538}$	$K^+ e^- \tau^+$	$LF$	$< 1.5$	$\times 10^{-5}$	CL=90%
$\Gamma_{539}$	$K^+ e^\pm \tau^\mp$	$LF$	$< 3.0$	$\times 10^{-5}$	CL=90%
$\Gamma_{540}$	$K^+ \mu^+ \tau^-$	$LF$	$< 4.5$	$\times 10^{-5}$	CL=90%
$\Gamma_{541}$	$K^+ \mu^- \tau^+$	$LF$	$< 2.8$	$\times 10^{-5}$	CL=90%
$\Gamma_{542}$	$K^+ \mu^\pm \tau^\mp$	$LF$	$< 4.8$	$\times 10^{-5}$	CL=90%
$\Gamma_{543}$	$K^*(892)^+ e^+ \mu^-$	$LF$	$< 1.3$	$\times 10^{-6}$	CL=90%
$\Gamma_{544}$	$K^*(892)^+ e^- \mu^+$	$LF$	$< 9.9$	$\times 10^{-7}$	CL=90%
$\Gamma_{545}$	$K^*(892)^+ e^\pm \mu^\mp$	$LF$	$< 1.4$	$\times 10^{-6}$	CL=90%
$\Gamma_{546}$	$\pi^- e^+ e^+$	$L$	$< 2.3$	$\times 10^{-8}$	CL=90%
$\Gamma_{547}$	$\pi^- \mu^+ \mu^+$	$L$	$< 4.0$	$\times 10^{-9}$	CL=95%
$\Gamma_{548}$	$\pi^- e^+ \mu^+$	$L$	$< 1.5$	$\times 10^{-7}$	CL=90%
$\Gamma_{549}$	$\rho^- e^+ e^+$	$L$	$< 1.7$	$\times 10^{-7}$	CL=90%
$\Gamma_{550}$	$\rho^- \mu^+ \mu^+$	$L$	$< 4.2$	$\times 10^{-7}$	CL=90%

$\Gamma_{551}$	$\rho^- e^+ \mu^+$	$L$	$< 4.7$	$\times 10^{-7}$	CL=90%
$\Gamma_{552}$	$K^- e^+ e^+$	$L$	$< 3.0$	$\times 10^{-8}$	CL=90%
$\Gamma_{553}$	$K^- \mu^+ \mu^+$	$L$	$< 4.1$	$\times 10^{-8}$	CL=90%
$\Gamma_{554}$	$K^- e^+ \mu^+$	$L$	$< 1.6$	$\times 10^{-7}$	CL=90%
$\Gamma_{555}$	$K^*(892)^- e^+ e^+$	$L$	$< 4.0$	$\times 10^{-7}$	CL=90%
$\Gamma_{556}$	$K^*(892)^- \mu^+ \mu^+$	$L$	$< 5.9$	$\times 10^{-7}$	CL=90%
$\Gamma_{557}$	$K^*(892)^- e^+ \mu^+$	$L$	$< 3.0$	$\times 10^{-7}$	CL=90%
$\Gamma_{558}$	$D^- e^+ e^+$	$L$	$< 2.6$	$\times 10^{-6}$	CL=90%
$\Gamma_{559}$	$D^- e^+ \mu^+$	$L$	$< 1.8$	$\times 10^{-6}$	CL=90%
$\Gamma_{560}$	$D^- \mu^+ \mu^+$	$L$	$< 6.9$	$\times 10^{-7}$	CL=95%
$\Gamma_{561}$	$D^{*-} \mu^+ \mu^+$	$L$	$< 2.4$	$\times 10^{-6}$	CL=95%
$\Gamma_{562}$	$D_s^- \mu^+ \mu^+$	$L$	$< 5.8$	$\times 10^{-7}$	CL=95%
$\Gamma_{563}$	$\overline{D}^0 \pi^- \mu^+ \mu^+$	$L$	$< 1.5$	$\times 10^{-6}$	CL=95%
$\Gamma_{564}$	$\Lambda^0 \mu^+$	$L, B$	$< 6$	$\times 10^{-8}$	CL=90%
$\Gamma_{565}$	$\Lambda^0 e^+$	$L, B$	$< 3.2$	$\times 10^{-8}$	CL=90%
$\Gamma_{566}$	$\overline{\Lambda}^0 \mu^+$	$L, B$	$< 6$	$\times 10^{-8}$	CL=90%
$\Gamma_{567}$	$\overline{\Lambda}^0 e^+$	$L, B$	$< 8$	$\times 10^{-8}$	CL=90%

- [a] An  $\ell$  indicates an  $e$  or a  $\mu$  mode, not a sum over these modes.  
 [b] An  $CP(\pm 1)$  indicates the  $CP=+1$  and  $CP=-1$  eigenstates of the  $D^0$ - $\overline{D}^0$  system.  
 [c]  $D$  denotes  $D^0$  or  $\overline{D}^0$ .  
 [d]  $D_{CP+}^{*0}$  decays into  $D^0 \pi^0$  with the  $D^0$  reconstructed in  $CP$ -even eigenstates  $K^+ K^-$  and  $\pi^+ \pi^-$ .  
 [e]  $\overline{D}^{**}$  represents an excited state with mass  $2.2 < M < 2.8 \text{ GeV}/c^2$ .  
 [f]  $X(3872)^+$  is a hypothetical charged partner of the  $X(3872)$ .  
 [g]  $\Theta(1710)^{++}$  is a possible narrow pentaquark state and  $G(2220)$  is a possible glueball resonance.  
 [h]  $(\overline{\Lambda}_c^- \rho)_s$  denotes a low-mass enhancement near  $3.35 \text{ GeV}/c^2$ .

### CONSTRAINED FIT INFORMATION

An overall fit to 3 branching ratios uses 6 measurements and one constraint to determine 3 parameters. The overall fit has a  $\chi^2 = 3.7$  for 4 degrees of freedom.

The following *off-diagonal* array elements are the correlation coefficients  $\langle \delta x_i \delta x_j \rangle / (\delta x_i \delta x_j)$ , in percent, from the fit to the branching fractions,  $x_i \equiv \Gamma_i / \Gamma_{\text{total}}$ . The fit constrains the  $x_i$  whose labels appear in this array to sum to one.

$$x_{365} \begin{vmatrix} & 10 \\ & x_{305} \end{vmatrix}$$

## CONSTRAINED FIT INFORMATION

An overall fit to 18 branching ratios uses 53 measurements and one constraint to determine 12 parameters. The overall fit has a  $\chi^2 = 49.2$  for 42 degrees of freedom.

The following *off-diagonal* array elements are the correlation coefficients  $\langle \delta x_i \delta x_j \rangle / (\delta x_i \delta x_j)$ , in percent, from the fit to the branching fractions,  $x_i \equiv \Gamma_i / \Gamma_{\text{total}}$ . The fit constrains the  $x_i$  whose labels appear in this array to sum to one.

$x_7$	33									
$x_{48}$	0	0								
$x_{98}$	0	0	8							
$x_{135}$	0	0	1	13						
$x_{255}$	0	0	0	0	0					
$x_{260}$	0	0	0	0	0	0				
$x_{273}$	0	0	0	0	0	28	0			
$x_{283}$	0	0	0	0	0	58	0	16		
$x_{516}$	0	0	0	0	0	14	0	4	8	
$x_{521}$	0	0	0	0	0	0	5	0	0	0
	$x_6$	$x_7$	$x_{48}$	$x_{98}$	$x_{135}$	$x_{255}$	$x_{260}$	$x_{273}$	$x_{283}$	$x_{516}$

## $B^+$ BRANCHING RATIOS

$\Gamma(\ell^+ \nu_\ell \text{ anything}) / \Gamma_{\text{total}}$   $\Gamma_1 / \Gamma$

"OUR EVALUATION" is an average using rescaled values of the data listed below.

The average and rescaling were performed by the Heavy Flavor Averaging Group (HFAG) and are described at <http://www.slac.stanford.edu/xorg/hfag/>. The averaging/rescaling procedure takes into account correlations between the measurements.

<u>VALUE (units <math>10^{-2}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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**10.99 ± 0.28 OUR EVALUATION**

**10.76 ± 0.32 OUR AVERAGE** Error includes scale factor of 1.1.

11.17 ± 0.25 ± 0.28 <sup>1</sup> URQUIJO 07 BELL  $e^+ e^- \rightarrow \gamma(4S)$

10.28 ± 0.26 ± 0.39 <sup>2</sup> AUBERT,B 06Y BABR  $e^+ e^- \rightarrow \gamma(4S)$

10.25 ± 0.57 ± 0.65 <sup>3</sup> ARTUSO 97 CLE2  $e^+ e^- \rightarrow \gamma(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

11.15 ± 0.26 ± 0.41 <sup>4</sup> OKABE 05 BELL Repl. by URQUIJO 07

10.1 ± 1.8 ± 1.5 ATHANAS 94 CLE2 Sup. by ARTUSO 97

<sup>1</sup> URQUIJO 07 report a measurement of  $(10.34 \pm 0.23 \pm 0.25)\%$  for the partial branching fraction of  $B^+ \rightarrow e^+ \nu_e X_C$  decay with electron energy above 0.6 GeV. We converted the result to  $B^+ \rightarrow e^+ \nu_e X$  branching fraction.

<sup>2</sup> The measurements are obtained for charged and neutral  $B$  mesons partial rates of semileptonic decay to electrons with momentum above 0.6 GeV/c in the  $B$  rest frame. The best precision on the ratio is achieved for a momentum threshold of 1.0 GeV:  $B(B^+ \rightarrow e^+ \nu_e X) / B(B^0 \rightarrow e^+ \nu_e X) = 1.074 \pm 0.041 \pm 0.026$ .

<sup>3</sup> ARTUSO 97 uses partial reconstruction of  $B \rightarrow D^* \ell \nu_\ell$  and inclusive semileptonic branching ratio from BARISH 96B ( $0.1049 \pm 0.0017 \pm 0.0043$ ).

<sup>4</sup> The measurements are obtained for charged and neutral  $B$  mesons partial rates of semileptonic decay to electrons with momentum above 0.6 GeV/c in the  $B$  rest frame, and their ratio of  $B(B^+ \rightarrow e^+ \nu_e X)/B(B^0 \rightarrow e^+ \nu_e X) = 1.08 \pm 0.05 \pm 0.02$ .

$\Gamma(e^+ \nu_e X_c)/\Gamma_{\text{total}}$   $\Gamma_2/\Gamma$

VALUE (units $10^{-2}$ )	DOCUMENT ID	TECN	COMMENT
<b>10.79 ± 0.25 ± 0.27</b>	<sup>1</sup> URQUIJO	07	BELL $e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Measure the independent  $B^+$  and  $B^0$  partial branching fractions with electron threshold energies of 0.4 GeV.

$\Gamma(\overline{D}^0 \ell^+ \nu_\ell)/\Gamma_{\text{total}}$   $\Gamma_4/\Gamma$

“OUR EVALUATION” is an average using rescaled values of the data listed below. The average and rescaling were performed by the Heavy Flavor Averaging Group (HFAG) and are described at <http://www.slac.stanford.edu/xorg/hfag/>. The averaging/rescaling procedure takes into account correlations between the measurements.  $\ell = e$  or  $\mu$ , not sum over  $e$  and  $\mu$  modes.

VALUE	DOCUMENT ID	TECN	COMMENT
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**0.0227 ± 0.0011 OUR EVALUATION**

**0.0229 ± 0.0008 OUR AVERAGE**

0.0229 ± 0.0008 ± 0.0009	<sup>1</sup> AUBERT	10	BABR $e^+ e^- \rightarrow \Upsilon(4S)$
0.0234 ± 0.0003 ± 0.0013	AUBERT	09A	BABR $e^+ e^- \rightarrow \Upsilon(4S)$
0.0221 ± 0.0013 ± 0.0019	<sup>2</sup> BARTELT	99	CLE2 $e^+ e^- \rightarrow \Upsilon(4S)$
0.016 ± 0.006 ± 0.003	<sup>3</sup> FULTON	91	CLEO $e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

0.0233 ± 0.0009 ± 0.0009	<sup>1</sup> AUBERT	08Q	BABR Repl. by AUBERT 09A
0.0194 ± 0.0015 ± 0.0034	<sup>4</sup> ATHANAS	97	CLE2 Repl. by BARTELT 99

<sup>1</sup> Uses a fully reconstructed  $B$  meson as a tag on the recoil side.

<sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>3</sup> FULTON 91 assumes equal production of  $B^0 \overline{B}^0$  and  $B^+ B^-$  at the  $\Upsilon(4S)$ .

<sup>4</sup> ATHANAS 97 uses missing energy and missing momentum to reconstruct neutrino.

$\Gamma(\overline{D}^0 \ell^+ \nu_\ell)/\Gamma(\ell^+ \nu_\ell \text{ anything})$   $\Gamma_4/\Gamma_1$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.255 ± 0.009 ± 0.009</b>	<sup>1</sup> AUBERT	10	BABR $e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Uses a fully reconstructed  $B$  meson on the recoil side.

$\Gamma(\overline{D}^0 \ell^+ \nu_\ell)/\Gamma(D \ell^+ \nu_\ell \text{ anything})$   $\Gamma_4/\Gamma_3$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.227 ± 0.014 ± 0.016</b>	<sup>1</sup> AUBERT	07AN	BABR $e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Uses a fully reconstructed  $B$  meson on the recoil side.

$\Gamma(\overline{D}^0 \tau^+ \nu_\tau)/\Gamma_{\text{total}}$   $\Gamma_5/\Gamma$

VALUE (units $10^{-2}$ )	DOCUMENT ID	TECN	COMMENT
<b>0.77 ± 0.22 ± 0.12</b>	<sup>1</sup> BOZEK	10	BELL $e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

0.67 ± 0.37 ± 0.13	<sup>2</sup> AUBERT	08N	BABR Repl. by AUBERT 09S
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> Uses a fully reconstructed  $B$  meson as a tag on the recoil side.

$$\Gamma(\overline{D}^0 \tau^+ \nu_\tau) / \Gamma(\overline{D}^0 \ell^+ \nu_\ell) \qquad \Gamma_5 / \Gamma_4$$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.429 ± 0.082 ± 0.052</b>	1,2 LEES	12D BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
0.314 ± 0.170 ± 0.049	<sup>1</sup> AUBERT	09S BABR	Repl. by LEES 12D

• • • We do not use the following data for averages, fits, limits, etc. • • •

<sup>1</sup> Uses a fully reconstructed  $B$  meson as a tag on the recoil side.

<sup>2</sup> Uses  $\tau^+ \rightarrow e^+ \nu_e \bar{\nu}_\tau$  and  $\tau^+ \rightarrow \mu^+ \nu_\mu \bar{\nu}_\tau$  and  $e^+$  or  $\mu^+$  as  $\ell^+$ .

$$\Gamma(\overline{D}^*(2007)^0 \ell^+ \nu_\ell) / \Gamma_{\text{total}} \qquad \Gamma_6 / \Gamma$$

"OUR EVALUATION" is an average using rescaled values of the data listed below.

The average and rescaling were performed by the Heavy Flavor Averaging Group (HFAG) and are described at <http://www.slac.stanford.edu/xorg/hfag/>. The averaging/rescaling procedure takes into account correlations between the measurements.

$\ell = e$  or  $\mu$ , not sum over  $e$  and  $\mu$  modes.

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.0569 ± 0.0019 OUR EVALUATION</b>				
<b>0.0560 ± 0.0026 OUR FIT</b>				Error includes scale factor of 1.5.
<b>0.0558 ± 0.0026 OUR AVERAGE</b>				Error includes scale factor of 1.5. See the ideogram below.

0.0540 ± 0.0002 ± 0.0021		AUBERT	09A BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
0.0556 ± 0.0008 ± 0.0041		<sup>1</sup> AUBERT	08AT BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
0.0650 ± 0.0020 ± 0.0043		<sup>2</sup> ADAM	03 CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$
0.066 ± 0.016 ± 0.015		<sup>3</sup> ALBRECHT	92C ARG	$e^+ e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.0583 ± 0.0015 ± 0.0030		<sup>4</sup> AUBERT	08Q BABR	Repl. by AUBERT 09A
0.0650 ± 0.0020 ± 0.0043		<sup>5</sup> BRIERE	02 CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$
0.0513 ± 0.0054 ± 0.0064	302	<sup>6</sup> BARISH	95 CLE2	Repl. by ADAM 03
seen	398	<sup>7</sup> SANGHERA	93 CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$
0.041 ± 0.008 <sup>+0.008</sup> / <sub>-0.009</sub>		<sup>8</sup> FULTON	91 CLEO	$e^+ e^- \rightarrow \Upsilon(4S)$
0.070 ± 0.018 ± 0.014		<sup>9</sup> ANTREASYAN	90B CBAL	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Measured using the dependence of  $B^- \rightarrow D^{*0} e^- \bar{\nu}_e$  decay differential rate and the form factor description by CAPRINI 98.

<sup>2</sup> Simultaneous measurements of both  $B^0 \rightarrow D^*(2010)^- \ell \nu$  and  $B^+ \rightarrow \overline{D}^*(2007)^0 \ell \nu$ .

<sup>3</sup> ALBRECHT 92C reports  $0.058 \pm 0.014 \pm 0.013$ . We rescale using the method described in STONE 94 but with the updated PDG 94  $B(D^0 \rightarrow K^- \pi^+)$ . Assumes equal production of  $B^0 \overline{B}^0$  and  $B^+ B^-$  at the  $\Upsilon(4S)$ .

<sup>4</sup> Uses a fully reconstructed  $B$  meson as a tag on the recoil side.

<sup>5</sup> The results are based on the same analysis and data sample reported in ADAM 03.

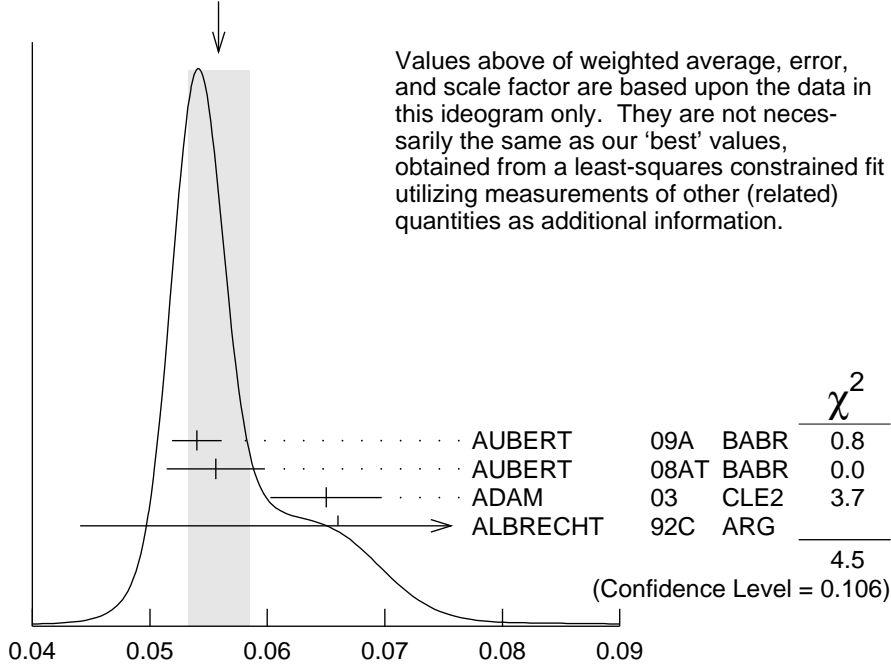
<sup>6</sup> BARISH 95 use  $B(D^0 \rightarrow K^- \pi^+) = (3.91 \pm 0.08 \pm 0.17)\%$  and  $B(D^{*0} \rightarrow D^0 \pi^0) = (63.6 \pm 2.3 \pm 3.3)\%$ .

<sup>7</sup> Combining  $\overline{D}^{*0} \ell^+ \nu_\ell$  and  $\overline{D}^{*-} \ell^+ \nu_\ell$  SANGHERA 93 test  $V-A$  structure and fit the decay angular distributions to obtain  $A_{FB} = 3/4 * (\Gamma^- - \Gamma^+) / \Gamma = 0.14 \pm 0.06 \pm 0.03$ . Assuming a value of  $V_{cb}$ , they measure  $V$ ,  $A_1$ , and  $A_2$ , the three form factors for the  $D^* \ell \nu_\ell$  decay, where results are slightly dependent on model assumptions.

<sup>8</sup> Assumes equal production of  $B^0 \overline{B}^0$  and  $B^+ B^-$  at the  $\Upsilon(4S)$ . Uncorrected for  $D$  and  $D^*$  branching ratio assumptions.

<sup>9</sup> ANTREASYAN 90B is average over  $B$  and  $\overline{D}^*(2010)$  charge states.

WEIGHTED AVERAGE  
 $0.0558 \pm 0.0026$  (Error scaled by 1.5)



Values above of weighted average, error, and scale factor are based upon the data in this ideogram only. They are not necessarily the same as our 'best' values, obtained from a least-squares constrained fit utilizing measurements of other (related) quantities as additional information.

$\Gamma(\bar{D}^*(2007)^0 \ell^+ \nu_\ell) / \Gamma_{\text{total}} \quad \Gamma_6 / \Gamma$

$\Gamma(\bar{D}^*(2007)^0 \ell^+ \nu_\ell) / \Gamma(D \ell^+ \nu_\ell \text{ anything}) \quad \Gamma_6 / \Gamma_3$

VALUE	DOCUMENT ID	TECN	COMMENT
<b><math>0.582 \pm 0.018 \pm 0.030</math></b>	<sup>1</sup> AUBERT	07AN BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Uses a fully reconstructed  $B$  meson on the recoil side.

$\Gamma(\bar{D}^*(2007)^0 \tau^+ \nu_\tau) / \Gamma_{\text{total}} \quad \Gamma_7 / \Gamma$

VALUE (units $10^{-2}$ )	DOCUMENT ID	TECN	COMMENT
<b><math>1.88 \pm 0.20</math> OUR FIT</b>			
$2.12^{+0.28}_{-0.27} \pm 0.29$	<sup>1</sup> BOZEK	10 BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$2.25 \pm 0.48 \pm 0.28$	<sup>2</sup> AUBERT	08N BABR	Repl. by AUBERT 09s
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> Uses a fully reconstructed  $B$  meson as a tag on the recoil side.

$\Gamma(\bar{D}^*(2007)^0 \tau^+ \nu_\tau) / \Gamma(\bar{D}^*(2007)^0 \ell^+ \nu_\ell) \quad \Gamma_7 / \Gamma_6$

VALUE	DOCUMENT ID	TECN	COMMENT
<b><math>0.335 \pm 0.034</math> OUR FIT</b>			
<b><math>0.322 \pm 0.032 \pm 0.022</math></b>	<sup>1,2</sup> LEES	12D BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$0.346 \pm 0.073 \pm 0.034$	<sup>1</sup> AUBERT	09s BABR	Repl. by LEES 12D
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<sup>1</sup> Uses a fully reconstructed  $B$  meson as a tag on the recoil side.

<sup>2</sup> Uses  $\tau^+ \rightarrow e^+ \nu_e \bar{\nu}_\tau$  and  $\tau^+ \rightarrow \mu^+ \nu_\mu \bar{\nu}_\tau$  and  $e^+$  or  $\mu^+$  as  $\ell^+$ .

$\Gamma(D^- \pi^+ \ell^+ \nu_\ell) / \Gamma_{\text{total}}$   $\Gamma_8 / \Gamma$

VALUE (units $10^{-3}$ )	DOCUMENT ID	TECN	COMMENT
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**4.2 ± 0.5 OUR AVERAGE**

4.2 ± 0.6 ± 0.3	<sup>1</sup> AUBERT	08Q	BABR $e^+ e^- \rightarrow \Upsilon(4S)$
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4.2 ± 0.6 ± 0.2	<sup>1,2</sup> LIVENTSEV	08	BELL $e^+ e^- \rightarrow \Upsilon(4S)$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

5.5 ± 0.9 ± 0.3	<sup>3</sup> LIVENTSEV	05	BELL Repl. by LIVENTSEV 08
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<sup>1</sup> Uses a fully reconstructed  $B$  meson as a tag on the recoil side.

<sup>2</sup> LIVENTSEV 08 reports  $(4.0 \pm 0.4 \pm 0.6) \times 10^{-3}$  from a measurement of  $[\Gamma(B^+ \rightarrow D^- \pi^+ \ell^+ \nu_\ell) / \Gamma_{\text{total}}] / [B(B^+ \rightarrow \bar{D}^0 \ell^+ \nu_\ell)]$  assuming  $B(B^+ \rightarrow \bar{D}^0 \ell^+ \nu_\ell) = (2.15 \pm 0.22) \times 10^{-2}$ , which we rescale to our best value  $B(B^+ \rightarrow \bar{D}^0 \ell^+ \nu_\ell) = (2.27 \pm 0.11) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>3</sup> LIVENTSEV 05 reports  $[\Gamma(B^+ \rightarrow D^- \pi^+ \ell^+ \nu_\ell) / \Gamma_{\text{total}}] / [B(B^0 \rightarrow D^- \ell^+ \nu_\ell)] = 0.25 \pm 0.03 \pm 0.03$  which we multiply by our best value  $B(B^0 \rightarrow D^- \ell^+ \nu_\ell) = (2.19 \pm 0.12) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\bar{D}_0^*(2420)^0 \ell^+ \nu_\ell, \bar{D}_0^{*0} \rightarrow D^- \pi^+) / \Gamma_{\text{total}}$   $\Gamma_9 / \Gamma$

VALUE (units $10^{-3}$ )	DOCUMENT ID	TECN	COMMENT
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**2.5 ± 0.5 OUR AVERAGE**

2.6 ± 0.5 ± 0.4	<sup>1</sup> AUBERT	08BL	BABR $e^+ e^- \rightarrow \Upsilon(4S)$
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2.4 ± 0.4 ± 0.6	<sup>1</sup> LIVENTSEV	08	BELL $e^+ e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Uses a fully reconstructed  $B$  meson as a tag on the recoil side.

$\Gamma(\bar{D}_2^*(2460)^0 \ell^+ \nu_\ell, \bar{D}_2^{*0} \rightarrow D^- \pi^+) / \Gamma_{\text{total}}$   $\Gamma_{10} / \Gamma$

VALUE (units $10^{-3}$ )	DOCUMENT ID	TECN	COMMENT
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**1.53 ± 0.16 OUR AVERAGE**

1.42 ± 0.15 ± 0.15	<sup>1</sup> AUBERT	09Y	BABR $e^+ e^- \rightarrow \Upsilon(4S)$
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1.5 ± 0.2 ± 0.2	<sup>2</sup> AUBERT	08BL	BABR $e^+ e^- \rightarrow \Upsilon(4S)$
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2.2 ± 0.3 ± 0.4	<sup>2</sup> LIVENTSEV	08	BELL $e^+ e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Uses a simultaneous fit of all  $B$  semileptonic decays without full reconstruction of events. AUBERT 09Y reports  $B(B^+ \rightarrow \bar{D}_2^*(2460)^0 \ell^+ \nu_\ell) \cdot B(\bar{D}_2^*(2460)^0 \rightarrow D^{(*)-} \pi^+) = (2.29 \pm 0.23 \pm 0.21) \times 10^{-3}$  and the authors have provided us the individual measurement.

<sup>2</sup> Uses a fully reconstructed  $B$  meson as a tag on the recoil side.

$\Gamma(D^{(*)} n \pi \ell^+ \nu_\ell (n \geq 1)) / \Gamma(D \ell^+ \nu_\ell \text{ anything})$   $\Gamma_{11} / \Gamma_3$

VALUE	DOCUMENT ID	TECN	COMMENT
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<b>0.191 ± 0.013 ± 0.019</b>	<sup>1</sup> AUBERT	07AN	BABR $e^+ e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Uses a fully reconstructed  $B$  meson on the recoil side.

$\Gamma(D^{*-} \pi^+ \ell^+ \nu_\ell) / \Gamma_{\text{total}}$   $\Gamma_{12} / \Gamma$

VALUE (units $10^{-3}$ )	DOCUMENT ID	TECN	COMMENT
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**6.1 ± 0.6 OUR AVERAGE**

5.9 ± 0.5 ± 0.4	<sup>1</sup> AUBERT	08Q	BABR $e^+ e^- \rightarrow \Upsilon(4S)$
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6.8 ± 1.1 ± 0.3	<sup>1,2</sup> LIVENTSEV	08	BELL $e^+ e^- \rightarrow \Upsilon(4S)$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

5.9 ± 1.4 ± 0.1	<sup>3,4</sup> LIVENTSEV	05	BELL Repl. by LIVENTSEV 08
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<sup>1</sup> Uses a fully reconstructed  $B$  meson as a tag on the recoil side.

<sup>2</sup> LIVENTSEV 08 reports  $(6.4 \pm 0.8 \pm 0.9) \times 10^{-3}$  from a measurement of  $[\Gamma(B^+ \rightarrow D^{*-} \pi^+ \ell^+ \nu_\ell) / \Gamma_{\text{total}}] / [B(B^+ \rightarrow \bar{D}^0 \ell^+ \nu_\ell)]$  assuming  $B(B^+ \rightarrow \bar{D}^0 \ell^+ \nu_\ell) = (2.15 \pm 0.22) \times 10^{-2}$ , which we rescale to our best value  $B(B^+ \rightarrow \bar{D}^0 \ell^+ \nu_\ell) = (2.27 \pm 0.11) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>3</sup> Excludes  $D^{*+}$  contribution to  $D\pi$  modes.

<sup>4</sup> LIVENTSEV 05 reports  $[\Gamma(B^+ \rightarrow D^{*-} \pi^+ \ell^+ \nu_\ell) / \Gamma_{\text{total}}] / [B(B^0 \rightarrow D^*(2010)^- \ell^+ \nu_\ell)] = 0.12 \pm 0.02 \pm 0.02$  which we multiply by our best value  $B(B^0 \rightarrow D^*(2010)^- \ell^+ \nu_\ell) = (4.93 \pm 0.11) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\bar{D}_1(2420)^0 \ell^+ \nu_\ell, \bar{D}_1^0 \rightarrow D^{*-} \pi^+) / \Gamma_{\text{total}}$   $\Gamma_{13} / \Gamma$

VALUE (units $10^{-3}$ )	DOCUMENT ID	TECN	COMMENT
<b>3.03 ± 0.20 OUR AVERAGE</b>			
2.97 ± 0.17 ± 0.17	1 AUBERT 09Y	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
2.9 ± 0.3 ± 0.3	2 AUBERT 08BL	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
4.2 ± 0.7 ± 0.7	2 LIVENTSEV 08	BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
3.73 ± 0.85 ± 0.57	3 ANASTASSOV 98	CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Uses a simultaneous measurement of all  $B$  semileptonic decays without full reconstruction of events.

<sup>2</sup> Uses a fully reconstructed  $B$  meson as a tag on the recoil side.

<sup>3</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\bar{D}'_1(2430)^0 \ell^+ \nu_\ell, \bar{D}'_1^0 \rightarrow D^{*-} \pi^+) / \Gamma_{\text{total}}$   $\Gamma_{14} / \Gamma$

VALUE (units $10^{-3}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>2.7 ± 0.4 ± 0.5</b>		1 AUBERT 08BL	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
< 0.7	90	1 LIVENTSEV 08	BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Uses a fully reconstructed  $B$  meson as a tag on the recoil side.

$\Gamma(\bar{D}_2^*(2460)^0 \ell^+ \nu_\ell, \bar{D}_2^{*0} \rightarrow D^{*-} \pi^+) / \Gamma_{\text{total}}$   $\Gamma_{15} / \Gamma$

VALUE (units $10^{-3}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>1.01 ± 0.24 OUR AVERAGE</b>		Error includes scale factor of 2.0.		
0.87 ± 0.11 ± 0.07		1 AUBERT 09Y	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
1.5 ± 0.2 ± 0.2		2 AUBERT 08BL	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
1.8 ± 0.6 ± 0.3		2 LIVENTSEV 08	BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
< 1.6	90	3 ANASTASSOV 98	CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Uses a simultaneous fit of all  $B$  semileptonic decays without full reconstruction of events. AUBERT 09Y reports  $B(B^+ \rightarrow \bar{D}_2^*(2460)^0 \ell^+ \nu_\ell) \cdot B(\bar{D}_2^*(2460)^0 \rightarrow D^{(*)-} \pi^+) = (2.29 \pm 0.23 \pm 0.21) \times 10^{-3}$  and the authors have provided us the individual measurement.

<sup>2</sup> Uses a fully reconstructed  $B$  meson as a tag on the recoil side.

<sup>3</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\bar{D}^0 \pi^+ \pi^- \ell^+ \nu_\ell) / \Gamma(\bar{D}^0 \ell^+ \nu_\ell)$   $\Gamma_{16} / \Gamma_4$

VALUE (units $10^{-2}$ )	DOCUMENT ID	TECN	COMMENT
<b>7.1 ± 1.3 ± 0.8</b>	1 LEES 16	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Measurement used electrons and muons as leptons.

$\Gamma(\bar{D}^{*0} \pi^+ \pi^- \ell^+ \nu_\ell) / \Gamma(\bar{D}^{*0} \ell^+ \nu_\ell)$   $\Gamma_{17} / \Gamma_6$

VALUE (units $10^{-2}$ )	DOCUMENT ID	TECN	COMMENT
<b>1.4 ± 0.7 ± 0.4</b>	<sup>1</sup> LEES	16	BABR $e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Measurement used electrons and muons as leptons.

$\Gamma(D_s^{(*)-} K^+ \ell^+ \nu_\ell) / \Gamma_{\text{total}}$   $\Gamma_{18} / \Gamma$

VALUE (units $10^{-4}$ )	DOCUMENT ID	TECN	COMMENT
<b>6.1 ± 1.0 OUR AVERAGE</b>			
5.9 ± 1.2 ± 1.5	<sup>1</sup> STYPULA	12	BELL $e^+ e^- \rightarrow \Upsilon(4S)$
6.13 <sup>+1.04</sup> <sub>-1.03</sub> ± 0.67	<sup>1</sup> DEL-AMO-SA..11L	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(D_s^- K^+ \ell^+ \nu_\ell) / \Gamma_{\text{total}}$   $\Gamma_{19} / \Gamma$

VALUE (units $10^{-4}$ )	DOCUMENT ID	TECN	COMMENT
<b>3.0 ± 0.9<sup>+1.1</sup><sub>-0.8</sub></b>	<sup>1</sup> STYPULA	12	BELL $e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(D_s^{*-} K^+ \ell^+ \nu_\ell) / \Gamma_{\text{total}}$   $\Gamma_{20} / \Gamma$

VALUE (units $10^{-4}$ )	DOCUMENT ID	TECN	COMMENT
<b>2.9 ± 1.6<sup>+1.1</sup><sub>-1.0</sub></b>	<sup>1,2</sup> STYPULA	12	BELL $e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> STYPULA 12 provides also an upper limit of  $0.56 \times 10^{-3}$  at 90% CL for the same data. Also measures branching fraction of the combined modes of  $D_s^- K^+ \ell^+ \nu_\ell$  and  $D_s^{*-} K^+ \ell^+ \nu_\ell$  as  $B(B^+ \rightarrow D_s^{(*)-} K^+ \ell^+ \nu_\ell) = (5.9 \pm 1.2 \pm 1.5) \times 10^{-4}$ .

$\Gamma(\pi^0 \ell^+ \nu_\ell) / \Gamma_{\text{total}}$   $\Gamma_{21} / \Gamma$

"OUR EVALUATION" is an average using rescaled values of the data listed below. The average and rescaling were performed by the Heavy Flavor Averaging Group (HFAG) and are described at <http://www.slac.stanford.edu/xorg/hfag/>. The averaging/rescaling procedure takes into account correlations between the measurements.

VALUE (units $10^{-4}$ )	DOCUMENT ID	TECN	COMMENT
<b>0.780 ± 0.027 OUR EVALUATION</b>			
<b>0.748 ± 0.029 OUR AVERAGE</b>			

0.80 ± 0.08 ± 0.04	<sup>1</sup> SIBIDANOV	13	BELL $e^+ e^- \rightarrow \Upsilon(4S)$
0.77 ± 0.04 ± 0.03	<sup>2</sup> LEES	12AA	BABR $e^+ e^- \rightarrow \Upsilon(4S)$
0.705 ± 0.025 ± 0.035	<sup>3</sup> DEL-AMO-SA..11C	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
0.82 ± 0.09 ± 0.05	<sup>3</sup> AUBERT	08AV	BABR $e^+ e^- \rightarrow \Upsilon(4S)$
0.77 ± 0.14 ± 0.08	<sup>4</sup> HOKUUE	07	BELL $e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

0.74 ± 0.05 ± 0.10	<sup>5</sup> AUBERT,B	05O	BABR Repl. by DEL-AMO-SANCHEZ 11C
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<sup>1</sup> The signal events are tagged by a second  $B$  meson reconstructed in the fully hadronic decays.

<sup>2</sup> Uses loose neutrino reconstruction technique. Assumes  $B(Y(4S) \rightarrow B^+ B^-) = (51.6 \pm 0.6)\%$  and  $B(Y(4S) \rightarrow B^0 \bar{B}^0) = (48.4 \pm 0.6)\%$ .

<sup>3</sup> Using the isospin symmetry relation,  $B^+$  and  $B^0$  branching fractions are combined.

<sup>4</sup> The signal events are tagged by a second  $B$  meson reconstructed in the semileptonic mode  $B \rightarrow D^{(*)} \ell \nu \ell$ .

<sup>5</sup>  $B^+$  and  $B^0$  decays combined assuming isospin symmetry. Systematic errors include both experimental and form-factor uncertainties.

### $\Gamma(\pi^0 e^+ \nu_e)/\Gamma_{\text{total}}$ $\Gamma_{22}/\Gamma$

<u>VALUE (units <math>10^{-4}</math>)</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
$0.9 \pm 0.2 \pm 0.2$		<sup>1</sup> ALEXANDER 96T	CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$
$< 22$	90	ANTREASYAN 90B	CBAL	$e^+ e^- \rightarrow \Upsilon(4S)$
<sup>1</sup> Derived based in the reported $B^0$ result by assuming isospin symmetry: $\Gamma(B^0 \rightarrow \pi^- \ell^+ \nu) = 2\Gamma(B^+ \rightarrow \pi^0 \ell^+ \nu)$ .				

### $\Gamma(\eta \ell^+ \nu_\ell)/\Gamma_{\text{total}}$ $\Gamma_{23}/\Gamma$

<u>VALUE (units <math>10^{-4}</math>)</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>0.38 \pm 0.06</math> OUR AVERAGE</b>				
$0.38 \pm 0.05 \pm 0.05$		<sup>1</sup> LEES	12AA BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
$0.31 \pm 0.06 \pm 0.08$		<sup>1</sup> AUBERT	09Q BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
$0.64 \pm 0.20 \pm 0.03$		<sup>2</sup> AUBERT	08AV BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
$0.36 \pm 0.05 \pm 0.04$		<sup>1</sup> DEL-AMO-SA..11F	BABR	Repl. by LEES 12AA
$< 1.01$	90	<sup>3</sup> ADAM	07 CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$
$0.84 \pm 0.31 \pm 0.18$		<sup>4</sup> ATHAR	03 CLE2	Repl. by ADAM 07
<sup>1</sup> Uses loose neutrino reconstruction technique. Assumes $B(\Upsilon(4S) \rightarrow B^+ B^-) = (51.6 \pm 0.6)\%$ and $B(\Upsilon(4S) \rightarrow B^0 \bar{B}^0) = (48.4 \pm 0.6)\%$ .				
<sup>2</sup> Assumes equal production of $B^+$ and $B^0$ at the $\Upsilon(4S)$ .				
<sup>3</sup> The $B^0$ and $B^+$ results are combined assuming the isospin, $B$ lifetimes, and relative charged/neutral $B$ production at the $\Upsilon(4S)$ .				
<sup>4</sup> ATHAR 03 reports systematic errors $0.16 \pm 0.09$ , which are experimental systematic and systematic due to model dependence. We combine these in quadrature.				

### $\Gamma(\eta' \ell^+ \nu_\ell)/\Gamma_{\text{total}}$ $\Gamma_{24}/\Gamma$

<u>VALUE (units <math>10^{-4}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>0.23 \pm 0.08</math> OUR AVERAGE</b>			
$0.24 \pm 0.08 \pm 0.03$	<sup>1</sup> LEES	12AA BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
$0.04 \pm 0.22^{+0.05}_{-0.02}$	<sup>2</sup> AUBERT	08AV BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
$2.66 \pm 0.80 \pm 0.56$	<sup>3</sup> ADAM	07 CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
$0.24 \pm 0.08 \pm 0.03$	<sup>1</sup> DEL-AMO-SA..11F	BABR	Repl. by LEES 12AA
<sup>1</sup> Uses loose neutrino reconstruction technique. Assumes $B(Y(4S) \rightarrow B^+ B^-) = (51.6 \pm 0.6)\%$ and $B(Y(4S) \rightarrow B^0 \bar{B}^0) = (48.4 \pm 0.6)\%$ .			
<sup>2</sup> Assumes equal production of $B^+$ and $B^0$ at the $\Upsilon(4S)$ .			
<sup>3</sup> The $B^0$ and $B^+$ results are combined assuming the isospin, $B$ lifetimes, and relative charged/neutral $B$ production at the $\Upsilon(4S)$ . Corresponds to 90% CL interval $(1.20-4.46) \times 10^{-4}$ .			

$\Gamma(\omega \ell^+ \nu_\ell) / \Gamma_{\text{total}}$   $\Gamma_{25} / \Gamma$   
 $\ell = e \text{ or } \mu$ , not sum over  $e$  and  $\mu$  modes.

<u>VALUE (units <math>10^{-4}</math>)</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>1.19 ± 0.09 OUR AVERAGE</b>				
1.21 ± 0.14 ± 0.08		1,2 LEES	13A BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
1.35 ± 0.21 ± 0.11		3 LEES	13T BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
1.07 ± 0.16 ± 0.07		4 SIBIDANOV	13 BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
1.19 ± 0.16 ± 0.09		2,5 LEES	12AA BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
1.3 ± 0.4 ± 0.4		6 SCHWANDA	04 BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
1.14 ± 0.16 ± 0.08		2 AUBERT	09Q BABR	Repl. by LEES 13A
<2.1	90	7 BEAN	93B CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> LEES 13A reports  $(1.21 \pm 0.14 \pm 0.08) \times 10^{-4}$  from a measurement of  $[\Gamma(B^+ \rightarrow \omega \ell^+ \nu_\ell) / \Gamma_{\text{total}}] \times [B(\omega(782) \rightarrow \pi^+ \pi^- \pi^0)]$  assuming  $B(\omega(782) \rightarrow \pi^+ \pi^- \pi^0) = (89.2 \pm 0.7) \times 10^{-2}$ .

<sup>2</sup> Uses  $B(\Upsilon(4S) \rightarrow B^+ B^-) = (51.6 \pm 0.6)\%$  and  $B(\Upsilon(4S) \rightarrow B^0 \bar{B}^0) = (48.4 \pm 0.6)\%$ .

<sup>3</sup> Uses semileptonic tagging. Assumes  $B(\omega \rightarrow \pi^+ \pi^- \pi^0) = (89.2 \pm 0.7)\%$  and that the production ratio of  $B^+ B^-$  to  $B^0 \bar{B}^0$  from  $\Upsilon(4S)$  is  $1.056 \pm 0.028$ . The partial branching fractions in three bins of  $q^2$  are also reported.

<sup>4</sup> The signal events are tagged by a second  $B$  meson reconstructed in the fully hadronic decays.

<sup>5</sup> Uses loose neutrino reconstruction technique.

<sup>6</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>7</sup> BEAN 93B limit set using ISGW Model. Using isospin and the quark model to combine  $\Gamma(\rho^0 \ell^+ \nu_\ell)$  and  $\Gamma(\rho^- \ell^+ \nu_\ell)$  with this result, they obtain a limit  $<(1.6-2.7) \times 10^{-4}$  at 90% CL for  $B^+ \rightarrow \omega \ell^+ \nu_\ell$ . The range corresponds to the ISGW, WSB, and KS models. An upper limit on  $|V_{ub}/V_{cb}| < 0.8-0.13$  at 90% CL is derived as well.

$\Gamma(\omega \mu^+ \nu_\mu) / \Gamma_{\text{total}}$   $\Gamma_{26} / \Gamma$

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●		
seen	1 ALBRECHT	91C ARG

<sup>1</sup> In ALBRECHT 91C, one event is fully reconstructed providing evidence for the  $b \rightarrow u$  transition.

$\Gamma(\rho^0 \ell^+ \nu_\ell) / \Gamma_{\text{total}}$   $\Gamma_{27} / \Gamma$   
 $\ell = e \text{ or } \mu$ , not sum over  $e$  and  $\mu$  modes.

“OUR EVALUATION” is an average using rescaled values of the data listed below. The average and rescaling were performed by the Heavy Flavor Averaging Group (HFAG) and are described at <http://www.slac.stanford.edu/xorg/hfag/>. The averaging/rescaling procedure takes into account correlations between the measurements and asymmetric lifetime errors.

<u>VALUE (units <math>10^{-4}</math>)</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>1.58 ± 0.11 OUR EVALUATION</b>				
<b>1.42 ± 0.23 OUR AVERAGE</b> Error includes scale factor of 2.4. See the ideogram below.				
1.83 ± 0.10 ± 0.10		1 SIBIDANOV	13 BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
0.94 ± 0.08 ± 0.14		2 DEL-AMO-SA..11C	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
1.33 ± 0.23 ± 0.18		3 HOKUUE	07 BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
1.34 ± 0.15 <sup>+0.28</sup> <sub>-0.32</sub>		4 BEHRENS	00 CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$1.16 \pm 0.11 \pm 0.30$	<sup>2</sup> AUBERT,B	050	BABR	Repl. by DEL-AMO-SANCHEZ 11C
$1.40 \pm 0.21^{+0.32}_{-0.33}$	<sup>4</sup> BEHRENS	00	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
$1.2 \pm 0.2^{+0.3}_{-0.4}$	<sup>4</sup> ALEXANDER	96T	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
$<2.1$	<sup>5</sup> BEAN	93B	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

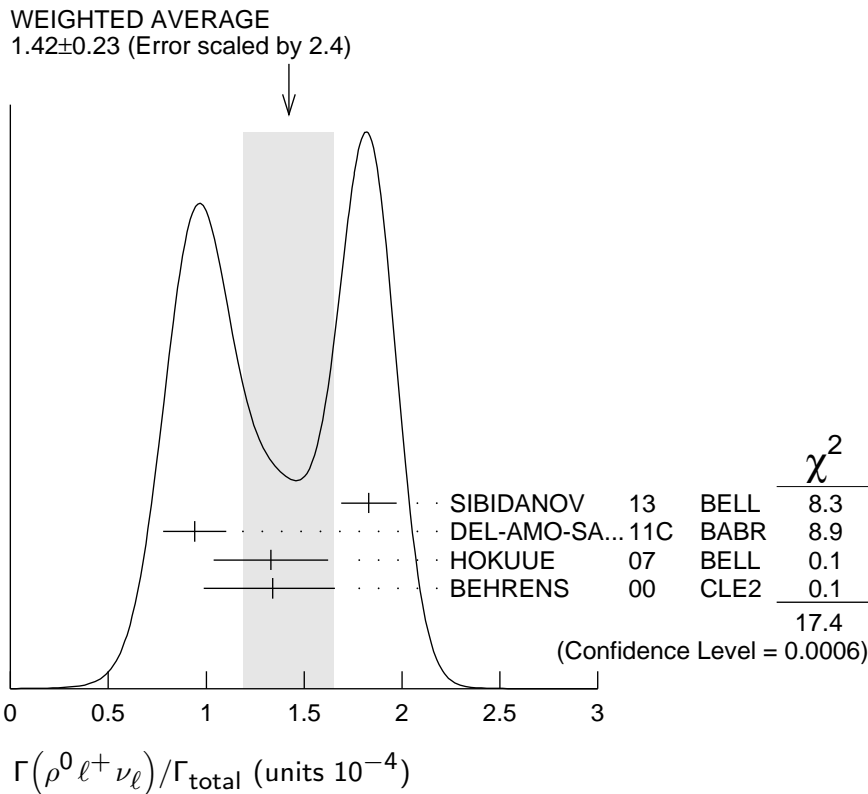
<sup>1</sup> The signal events are tagged by a second  $B$  meson reconstructed in the fully hadronic decays.

<sup>2</sup>  $B^+$  and  $B^0$  decays combined assuming isospin symmetry. Systematic errors include both experimental and form-factor uncertainties.

<sup>3</sup> The signal events are tagged by a second  $B$  meson reconstructed in the semileptonic mode  $B \rightarrow D^{(*)} \ell \nu_\ell$ .

<sup>4</sup> Derived based in the reported  $B^0$  result by assuming isospin symmetry:  $\Gamma(B^0 \rightarrow \rho^- \ell^+ \nu) = 2\Gamma(B^+ \rightarrow \rho^0 \ell^+ \nu) \approx 2\Gamma(B^+ \rightarrow \omega \ell^+ \nu)$ .

<sup>5</sup> BEAN 93B limit set using ISGW Model. Using isospin and the quark model to combine  $\Gamma(\omega^0 \ell^+ \nu_\ell)$  and  $\Gamma(\rho^- \ell^+ \nu_\ell)$  with this result, they obtain a limit  $<(1.6-2.7) \times 10^{-4}$  at 90% CL for  $B^+ \rightarrow \rho^0 \ell^+ \nu_\ell$ . The range corresponds to the ISGW, WSB, and KS models. An upper limit on  $|V_{ub}/V_{cb}| < 0.8-0.13$  at 90% CL is derived as well.



$\Gamma(\rho^0 \ell^+ \nu_\ell) / \Gamma_{\text{total}}$	$\Gamma_{28} / \Gamma$
<u>VALUE (units <math>10^{-6}</math>)</u>	<u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>
<b><math>5.8^{+2.4}_{-2.1} \pm 0.9</math></b>	<sup>1</sup> TIEN    14    BELL $e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(p\bar{p}\mu^+\nu_\mu)/\Gamma_{\text{total}}$   $\Gamma_{29}/\Gamma$ 

<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$<8.5 \times 10^{-6}$	90	<sup>1</sup> TIEN	14	BELL $e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

 $\Gamma(p\bar{p}e^+\nu_e)/\Gamma_{\text{total}}$   $\Gamma_{30}/\Gamma$ 

<u>VALUE (units <math>10^{-6}</math>)</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$8.2^{+3.7}_{-3.2} \pm 0.6$		<sup>1</sup> TIEN	14	BELL $e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$<5200$	90	<sup>2</sup> ADAM	03B	CLE2 $e^+e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> Based on phase-space model; if  $V-A$  model is used, the 90% CL upper limit becomes  $< 1.2 \times 10^{-3}$ .

 $\Gamma(e^+\nu_e)/\Gamma_{\text{total}}$   $\Gamma_{31}/\Gamma$ 

<u>VALUE (units <math>10^{-6}</math>)</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$< 0.98$	90	<sup>1</sup> SATOYAMA	07	BELL $e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$< 3.5$	90	<sup>2</sup> YOOK	15	BELL $e^+e^- \rightarrow \Upsilon(4S)$
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$< 8$	90	<sup>1</sup> AUBERT	10E	BABR $e^+e^- \rightarrow \Upsilon(4S)$
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$< 1.9$	90	<sup>1</sup> AUBERT	09V	BABR $e^+e^- \rightarrow \Upsilon(4S)$
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$< 5.2$	90	<sup>1</sup> AUBERT	08AD	BABR $e^+e^- \rightarrow \Upsilon(4S)$
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$<15$	90	ARTUSO	95	CLE2 $e^+e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> Assumes  $B(\Upsilon(4S) \rightarrow B^+B^-) = 0.513 \pm 0.006$ .

 $\Gamma(\mu^+\nu_\mu)/\Gamma_{\text{total}}$   $\Gamma_{32}/\Gamma$ 

<u>VALUE (units <math>10^{-6}</math>)</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$< 1.0$	90	<sup>1</sup> AUBERT	09V	BABR $e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$< 2.7$	90	<sup>2</sup> YOOK	15	BELL $e^+e^- \rightarrow \Upsilon(4S)$
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$<11$	90	<sup>1</sup> AUBERT	10E	BABR $e^+e^- \rightarrow \Upsilon(4S)$
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$< 5.6$	90	<sup>1</sup> AUBERT	08AD	BABR $e^+e^- \rightarrow \Upsilon(4S)$
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$< 1.7$	90	<sup>1</sup> SATOYAMA	07	BELL $e^+e^- \rightarrow \Upsilon(4S)$
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$< 6.6$	90	AUBERT	04O	BABR Repl. by AUBERT 09V
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$<21$	90	ARTUSO	95	CLE2 $e^+e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> Assumes  $B(\Upsilon(4S) \rightarrow B^+B^-) = 0.513 \pm 0.006$ .

 $\Gamma(\tau^+\nu_\tau)/\Gamma_{\text{total}}$   $\Gamma_{33}/\Gamma$ 

See the note on "Decay Constants of Charged Pseudoscalar Mesons" in the  $D_s^+$  Listings.

<u>VALUE (units <math>10^{-4}</math>)</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>1.09 \pm 0.24</math> OUR AVERAGE</b>		Error includes scale factor of 1.2.		
$1.25 \pm 0.28 \pm 0.27$		<sup>1,2</sup> KRONENBIT...15	BELL	$e^+e^- \rightarrow \Upsilon(4S)$
$0.72^{+0.27}_{-0.25} \pm 0.11$		<sup>3</sup> HARA	13	BELL $e^+e^- \rightarrow \Upsilon(4S)$

$1.83^{+0.53}_{-0.49} \pm 0.24$		2,4 LEES	13K BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$1.7 \pm 0.8 \pm 0.2$		2,5 AUBERT	10E BABR	$e^+e^- \rightarrow \Upsilon(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
$1.54^{+0.38+0.29}_{-0.37-0.31}$		2,6 HARA	10 BELL	Repl. by KRONENBITTER 15
$1.8^{+0.9}_{-0.8} \pm 0.45$		2,7 AUBERT	08D BABR	Repl. by LEES 13K
$0.9 \pm 0.6 \pm 0.1$		2,5 AUBERT	07AL BABR	Repl. by AUBERT 10E
< 2.6	90	<sup>2</sup> AUBERT	06K BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$1.79^{+0.56+0.46}_{-0.49-0.51}$		2,7 IKADO	06 BELL	Repl. by HARA 13
< 4.2	90	<sup>2</sup> AUBERT,B	05B BABR	Repl. by AUBERT 06K
< 8.3	90	<sup>8</sup> BARATE	01E ALEP	$e^+e^- \rightarrow Z$
< 8.4	90	<sup>2</sup> BROWDER	01 CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
< 5.7	90	<sup>9</sup> ACCIARRI	97F L3	$e^+e^- \rightarrow Z$
<104	90	<sup>10</sup> ALBRECHT	95D ARG	$e^+e^- \rightarrow \Upsilon(4S)$
< 22	90	ARTUSO	95 CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
< 18	90	<sup>11</sup> BUSKULIC	95 ALEP	$e^+e^- \rightarrow Z$

<sup>1</sup> Requires one reconstructed semileptonic  $B$  decay  $B^- \rightarrow D^{(*)0} \ell^- \bar{\nu}_\ell$  in the recoil.

<sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>3</sup> The authors combine their result with that from HARA 10 obtaining  $B(B^- \rightarrow \tau^- \bar{\nu}_\tau) = (0.96 \pm 0.26) \times 10^{-4}$  and deriving  $f_B |V_{ub}| = (7.4 \pm 0.8 \pm 0.5) \times 10^{-4}$  GeV.

<sup>4</sup> Requires a fully reconstructed hadronic  $B$ -decay in the recoil. Reports that this result combined with AUBERT 10E value gives  $B(B^- \rightarrow \tau^- \bar{\nu}_\tau) = (1.79 \pm 0.48) \times 10^{-4}$ .

<sup>5</sup> Requires one reconstructed semileptonic  $B$  decay  $B^- \rightarrow D^0 \ell^- \bar{\nu}_\ell X$  in the recoil.

<sup>6</sup> Requires one reconstructed semileptonic  $B$  decay  $B^- \rightarrow D^{(*)0} \ell^- \bar{\nu}_\ell X$  in the recoil.

<sup>7</sup> The analysis is based on a sample of events with one fully reconstructed tag  $B$  in a hadronic decay mode  $B^- \rightarrow D^{(*)0} X^-$ .

<sup>8</sup> The energy-flow and  $b$ -tagging algorithms were used.

<sup>9</sup> ACCIARRI 97F uses missing-energy technique and  $f(b \rightarrow B^-) = (38.2 \pm 2.5)\%$ .

<sup>10</sup> ALBRECHT 95D uses full reconstruction of one  $B$  decay as tag.

<sup>11</sup> BUSKULIC 95 uses same missing-energy technique as in  $\bar{b} \rightarrow \tau^+ \nu_\tau X$ , but analysis is restricted to endpoint region of missing-energy distribution.

### $\Gamma(\ell^+ \nu_\ell \gamma) / \Gamma_{\text{total}}$

$\Gamma_{34} / \Gamma$

<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
< $3.5 \times 10^{-6}$	90	<sup>1</sup> HELLER	15 BELL	$e^+e^- \rightarrow \Upsilon(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
< $15.6 \times 10^{-6}$	90	<sup>1</sup> AUBERT	09AT BABR	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

### $\Gamma(e^+ \nu_e \gamma) / \Gamma_{\text{total}}$

$\Gamma_{35} / \Gamma$

<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
< $6.1 \times 10^{-6}$	90	<sup>1</sup> HELLER	15 BELL	$e^+e^- \rightarrow \Upsilon(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
< $17 \times 10^{-6}$	90	<sup>1</sup> AUBERT	09AT BABR	$e^+e^- \rightarrow \Upsilon(4S)$
< $200 \times 10^{-6}$	90	<sup>2</sup> BROWDER	97 CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> BROWDER 97 uses the hermiticity of the CLEO II detector to reconstruct the neutrino energy and momentum.

$\Gamma(\mu^+ \nu_\mu \gamma)/\Gamma_{\text{total}}$   $\Gamma_{36}/\Gamma$

<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$< 3.4 \times 10^{-6}$	90	<sup>1</sup> HELLER	15 BELL	$e^+ e^- \rightarrow \gamma(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
$< 24 \times 10^{-6}$	90	<sup>1,2</sup> AUBERT	09AT BABR	$e^+ e^- \rightarrow \gamma(4S)$
$< 52 \times 10^{-6}$	90	<sup>3</sup> BROWDER	97 CLE2	$e^+ e^- \rightarrow \gamma(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\gamma(4S)$ .

<sup>2</sup> Note that the value given by Aubert 2009 is 24 E-6 in the paper abstract, and 26 E-6 in the paper itself (Table I).

<sup>3</sup> BROWDER 97 uses the hermiticity of the CLEO II detector to reconstruct the neutrino energy and momentum.

$\Gamma(D^0 X)/\Gamma_{\text{total}}$   $\Gamma_{37}/\Gamma$

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$0.086 \pm 0.006 \pm 0.004$	<sup>1</sup> AUBERT	07N BABR	$e^+ e^- \rightarrow \gamma(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
$0.098 \pm 0.009 \pm 0.006$	<sup>1</sup> AUBERT, BE	04B BABR	Repl. by AUBERT 07N

<sup>1</sup> Events are selected by completely reconstructing one  $B$  and searching for a reconstructed charmed particle in the rest of the event. The last error includes systematic and charm branching ratio uncertainties.

$\Gamma(\overline{D}^0 X)/\Gamma_{\text{total}}$   $\Gamma_{38}/\Gamma$

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$0.786 \pm 0.016^{+0.034}_{-0.033}$	<sup>1</sup> AUBERT	07N BABR	$e^+ e^- \rightarrow \gamma(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
$0.793 \pm 0.025^{+0.045}_{-0.044}$	<sup>1</sup> AUBERT, BE	04B BABR	Repl. by AUBERT 07N

<sup>1</sup> Events are selected by completely reconstructing one  $B$  and searching for a reconstructed charmed particle in the rest of the event. The last error includes systematic and charm branching ratio uncertainties.

$\Gamma(D^0 X)/[\Gamma(D^0 X) + \Gamma(\overline{D}^0 X)]$   $\Gamma_{37}/(\Gamma_{37} + \Gamma_{38})$

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$0.098 \pm 0.007 \pm 0.001$	AUBERT	07N BABR	$e^+ e^- \rightarrow \gamma(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
$0.110 \pm 0.010 \pm 0.003$	AUBERT, BE	04B BABR	Repl. by AUBERT 07N

$\Gamma(D^+ X)/\Gamma_{\text{total}}$   $\Gamma_{39}/\Gamma$

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$0.025 \pm 0.005 \pm 0.002$	<sup>1</sup> AUBERT	07N BABR	$e^+ e^- \rightarrow \gamma(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
$0.038 \pm 0.009 \pm 0.005$	<sup>1</sup> AUBERT, BE	04B BABR	Repl. by AUBERT 07N

<sup>1</sup> Events are selected by completely reconstructing one  $B$  and searching for a reconstructed charmed particle in the rest of the event. The last error includes systematic and charm branching ratio uncertainties.



$\Gamma(D^- X)/\Gamma_{\text{total}}$   $\Gamma_{40}/\Gamma$

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.099±0.008±0.009</b>	<sup>1</sup> AUBERT	07N	BABR $e^+e^- \rightarrow \gamma(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.098±0.012±0.014	<sup>1</sup> AUBERT,BE	04B	BABR Repl. by AUBERT 07N

<sup>1</sup> Events are selected by completely reconstructing one *B* and searching for a reconstructed charmed particle in the rest of the event. The last error includes systematic and charm branching ratio uncertainties.

$\Gamma(D^+ X)/[\Gamma(D^+ X) + \Gamma(D^- X)]$   $\Gamma_{39}/(\Gamma_{39}+\Gamma_{40})$

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.204±0.035±0.001</b>	AUBERT	07N	BABR $e^+e^- \rightarrow \gamma(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.278±0.052±0.009	AUBERT,BE	04B	BABR Repl. by AUBERT 07N

$\Gamma(D_s^+ X)/\Gamma_{\text{total}}$   $\Gamma_{41}/\Gamma$

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.079±0.006<sup>+0.013</sup><sub>-0.011</sub></b>	<sup>1</sup> AUBERT	07N	BABR $e^+e^- \rightarrow \gamma(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.143±0.016 <sup>+0.051</sup> <sub>-0.034</sub>	<sup>1</sup> AUBERT,BE	04B	BABR Repl. by AUBERT 07N

<sup>1</sup> Events are selected by completely reconstructing one *B* and searching for a reconstructed charmed particle in the rest of the event. The last error includes systematic and charm branching ratio uncertainties.

$\Gamma(D_s^- X)/\Gamma_{\text{total}}$   $\Gamma_{42}/\Gamma$

<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.011<sup>+0.004+0.002</sup><sub>-0.003-0.001</sub></b>		<sup>1</sup> AUBERT	07N	BABR $e^+e^- \rightarrow \gamma(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<0.022	90	<sup>1</sup> AUBERT,BE	04B	BABR Repl. by AUBERT 07N

<sup>1</sup> Events are selected by completely reconstructing one *B* and searching for a reconstructed charmed particle in the rest of the event. The last error includes systematic and charm branching ratio uncertainties.

$\Gamma(D_s^+ X)/[\Gamma(D_s^+ X) + \Gamma(D_s^- X)]$   $\Gamma_{41}/(\Gamma_{41}+\Gamma_{42})$

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.884±0.038±0.002</b>	AUBERT	07N	BABR $e^+e^- \rightarrow \gamma(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.966±0.039±0.012	AUBERT,BE	04B	BABR Repl. by AUBERT 07N

$\Gamma(D_s^- X)/[\Gamma(D_s^+ X) + \Gamma(D_s^- X)]$   $\Gamma_{42}/(\Gamma_{41}+\Gamma_{42})$

<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>&lt;0.126</b>	90	AUBERT,BE	04B	BABR $e^+e^- \rightarrow \gamma(4S)$

$\Gamma(\Lambda_c^+ X)/\Gamma_{\text{total}}$				$\Gamma_{43}/\Gamma$
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
$0.021 \pm 0.005^{+0.008}_{-0.004}$	<sup>1</sup> AUBERT	07N	BABR $e^+e^- \rightarrow \gamma(4S)$	

• • • We do not use the following data for averages, fits, limits, etc. • • •

$0.029 \pm 0.008^{+0.011}_{-0.007}$	<sup>1</sup> AUBERT, BE	04B	BABR Repl. by AUBERT 07N	
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<sup>1</sup> Events are selected by completely reconstructing one  $B$  and searching for a reconstructed charmed particle in the rest of the event. The last error includes systematic and charm branching ratio uncertainties.

$\Gamma(\bar{\Lambda}_c^- X)/\Gamma_{\text{total}}$				$\Gamma_{44}/\Gamma$
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
$0.028 \pm 0.005^{+0.010}_{-0.007}$	<sup>1</sup> AUBERT	07N	BABR $e^+e^- \rightarrow \gamma(4S)$	

• • • We do not use the following data for averages, fits, limits, etc. • • •

$0.035 \pm 0.008^{+0.013}_{-0.009}$	<sup>1</sup> AUBERT, BE	04B	BABR Repl. by AUBERT 07N	
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<sup>1</sup> Events are selected by completely reconstructing one  $B$  and searching for a reconstructed charmed particle in the rest of the event. The last error includes systematic and charm branching ratio uncertainties.

$\Gamma(\Lambda_c^+ X)/[\Gamma(\Lambda_c^+ X) + \Gamma(\bar{\Lambda}_c^- X)]$				$\Gamma_{43}/(\Gamma_{43} + \Gamma_{44})$
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
$0.427 \pm 0.071 \pm 0.001$	AUBERT	07N	BABR $e^+e^- \rightarrow \gamma(4S)$	

• • • We do not use the following data for averages, fits, limits, etc. • • •

$0.452 \pm 0.090 \pm 0.003$	AUBERT, BE	04B	BABR Repl. by AUBERT 07N	
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$\Gamma(\bar{c} X)/\Gamma_{\text{total}}$				$\Gamma_{45}/\Gamma$
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
$0.968 \pm 0.019^{+0.041}_{-0.039}$	<sup>1</sup> AUBERT	07N	BABR $e^+e^- \rightarrow \gamma(4S)$	

• • • We do not use the following data for averages, fits, limits, etc. • • •

$0.983 \pm 0.030^{+0.054}_{-0.051}$	<sup>1</sup> AUBERT, BE	04B	BABR Repl. by AUBERT 07N	
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<sup>1</sup> Events are selected by completely reconstructing one  $B$  and searching for a reconstructed charmed particle in the rest of the event. The last error includes systematic and charm branching ratio uncertainties.

$\Gamma(c X)/\Gamma_{\text{total}}$				$\Gamma_{46}/\Gamma$
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
$0.234 \pm 0.012^{+0.018}_{-0.014}$	<sup>1</sup> AUBERT	07N	BABR $e^+e^- \rightarrow \gamma(4S)$	

• • • We do not use the following data for averages, fits, limits, etc. • • •

$0.330 \pm 0.022^{+0.055}_{-0.037}$	<sup>1</sup> AUBERT, BE	04B	BABR Repl. by AUBERT 07N	
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<sup>1</sup> Events are selected by completely reconstructing one  $B$  and searching for a reconstructed charmed particle in the rest of the event. The last error includes systematic and charm branching ratio uncertainties.

$\Gamma(c/\bar{c}X)/\Gamma_{\text{total}}$	$\Gamma_{47}/\Gamma$			
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
$1.202 \pm 0.023^{+0.053}_{-0.049}$	<sup>1</sup> AUBERT	07N	BABR	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$1.313 \pm 0.037^{+0.088}_{-0.075}$	<sup>1</sup> AUBERT, BE	04B	BABR	Repl. by AUBERT 07N
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<sup>1</sup> Events are selected by completely reconstructing one  $B$  and searching for a reconstructed charmed particle in the rest of the event. The last error includes systematic and charm branching ratio uncertainties.

$\Gamma(\bar{D}^0\pi^+)/\Gamma_{\text{total}}$	$\Gamma_{48}/\Gamma$			
<u>VALUE (units <math>10^{-3}</math>)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>4.80 \pm 0.15</math> OUR FIT</b>				
<b><math>4.83 \pm 0.15</math> OUR AVERAGE</b>				

$4.90 \pm 0.07 \pm 0.22$		<sup>1</sup> AUBERT	07H	BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$5.0 \pm 0.6 \pm 0.3$		<sup>2</sup> ABULENCIA	06J	CDF	$p\bar{p}$ at 1.96 TeV
$4.49 \pm 0.21 \pm 0.23$		<sup>3</sup> AUBERT, BE	06J	BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$4.97 \pm 0.12 \pm 0.29$		<sup>1,4</sup> AHMED	02B	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
$5.0 \pm 0.7 \pm 0.6$	54	<sup>5</sup> BORTOLETTO92		CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
$5.4^{+1.8}_{-1.5}^{+1.2}_{-0.9}$	14	<sup>6</sup> BEBEK	87	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$4.70 \pm 0.26 \pm 0.05$		<sup>7</sup> AUBERT, B	04P	BABR	Repl. by AUBERT 07H
$5.5 \pm 0.4 \pm 0.5$	304	<sup>8</sup> ALAM	94	CLE2	Repl. by AHMED 02B
$2.0 \pm 0.8 \pm 0.6$	12	<sup>5</sup> ALBRECHT	90J	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
$1.9 \pm 1.0 \pm 0.6$	7	<sup>9</sup> ALBRECHT	88K	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> ABULENCIA 06J reports  $[\Gamma(B^+ \rightarrow \bar{D}^0\pi^+)/\Gamma_{\text{total}}] / [B(B^0 \rightarrow D^-\pi^+)] = 1.97 \pm 0.10 \pm 0.21$  which we multiply by our best value  $B(B^0 \rightarrow D^-\pi^+) = (2.52 \pm 0.13) \times 10^{-3}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>3</sup> Uses a missing-mass method. Does not depend on  $D$  branching fractions or  $B^+/B^0$  production rates.

<sup>4</sup> AHMED 02B reports an additional uncertainty on the branching ratios to account for 4.5% uncertainty on relative production of  $B^0$  and  $B^+$ , which is not included here.

<sup>5</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$  and uses the Mark III branching fractions for the  $D$ .

<sup>6</sup> BEBEK 87 value has been updated in BERKELMAN 91 to use same assumptions as noted for BORTOLETTO 92.

<sup>7</sup> AUBERT, B 04P reports  $[\Gamma(B^+ \rightarrow \bar{D}^0\pi^+)/\Gamma_{\text{total}}] \times [B(D^0 \rightarrow K^-\pi^+)] = (1.846 \pm 0.032 \pm 0.097) \times 10^{-4}$  which we divide by our best value  $B(D^0 \rightarrow K^-\pi^+) = (3.93 \pm 0.04) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>8</sup> ALAM 94 assume equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$  and use the CLEO II absolute  $B(D^0 \rightarrow K^-\pi^+)$  and the PDG 1992  $B(D^0 \rightarrow K^-\pi^+\pi^0)/B(D^0 \rightarrow K^-\pi^+)$  and  $B(D^0 \rightarrow K^-\pi^+\pi^-)/B(D^0 \rightarrow K^-\pi^+)$ .

<sup>9</sup> ALBRECHT 88K assumes  $B^0\bar{B}^0:B^+B^-$  ratio is 45:55. Superseded by ALBRECHT 90J.

$\Gamma(\bar{D}^0 \rho^+)/\Gamma_{\text{total}}$

$\Gamma_{51}/\Gamma$

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.0134 ± 0.0018 OUR AVERAGE</b>				
0.0135 ± 0.0012 ± 0.0015	212	<sup>1</sup> ALAM	94 CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
0.013 ± 0.004 ± 0.004	19	<sup>2</sup> ALBRECHT	90J ARG	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.021 ± 0.008 ± 0.009	10	<sup>3</sup> ALBRECHT	88K ARG	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> ALAM 94 assume equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$  and use the CLEO II absolute  $B(D^0 \rightarrow K^- \pi^+)$  and the PDG 1992  $B(D^0 \rightarrow K^- \pi^+ \pi^0)/B(D^0 \rightarrow K^- \pi^+)$  and  $B(D^0 \rightarrow K^- 2\pi^+ \pi^-)/B(D^0 \rightarrow K^- \pi^+)$ .  
<sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$  and uses the Mark III branching fractions for the  $D$ .  
<sup>3</sup> ALBRECHT 88K assumes  $B^0 \bar{B}^0 : B^+ B^-$  ratio is 45:55.

$\Gamma(\bar{D}^0 K^+)/\Gamma(\bar{D}^0 \pi^+)$

$\Gamma_{52}/\Gamma_{48}$

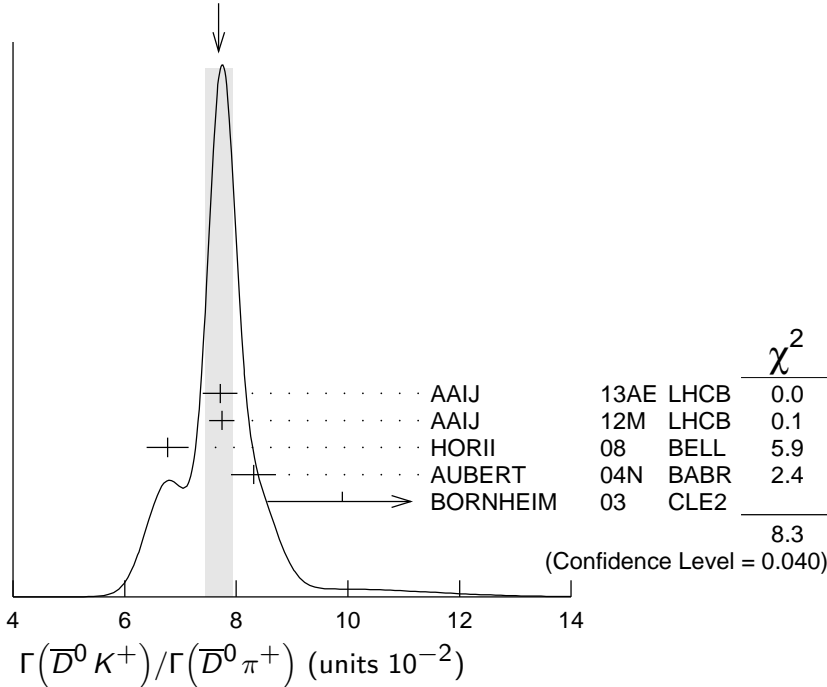
VALUE (units $10^{-2}$ )	DOCUMENT ID	TECN	COMMENT
<b>7.69 ± 0.25 OUR AVERAGE</b> Error includes scale factor of 1.7. See the ideogram below.			
7.71 ± 0.17 ± 0.26	<sup>1</sup> AAIJ	13AE LHCb	$pp$ at 7 TeV
7.74 ± 0.12 ± 0.19	AAIJ	12M LHCb	$pp$ at 7 TeV
6.77 ± 0.23 ± 0.30	HORII	08 BELL	$e^+e^- \rightarrow \Upsilon(4S)$
8.31 ± 0.35 ± 0.20	AUBERT	04N BABR	$e^+e^- \rightarrow \Upsilon(4S)$
9.9 <sup>+1.4 +0.7</sup> <sub>-1.2 -0.6</sub>	BORNHEIM	03 CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

9.4 ± 0.9 ± 0.7	ABE	03D BELL	Repl. by SWAIN 03
7.7 ± 0.5 ± 0.6	SWAIN	03 BELL	Repl. by HORII 08
7.9 ± 0.9 ± 0.6	ABE	01I BELL	Repl. by ABE 03D
5.5 ± 1.4 ± 0.5	ATHANAS	98 CLE2	Repl. by BORNHEIM 03

<sup>1</sup> Uses  $B^\pm \rightarrow [K^\pm \pi^\mp \pi^+ \pi^-]_D h^\pm$  mode.

WEIGHTED AVERAGE  
 7.69 ± 0.25 (Error scaled by 1.7)



$$\Gamma(D_{CP(+1)}K^+)/\Gamma(D_{CP(+1)}\pi^+) \quad \Gamma_{53}/\Gamma_{49}$$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.087±0.007 OUR AVERAGE</b>			
0.087±0.008±0.003	<sup>1,2</sup> ABE	06	BELL $e^+e^- \rightarrow \gamma(4S)$
0.088±0.016±0.005	<sup>3</sup> AUBERT	04N	BABR $e^+e^- \rightarrow \gamma(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.125±0.036±0.010	<sup>3</sup> ABE	03D	BELL Repl. by SWAIN 03
0.093±0.018±0.008	<sup>3</sup> SWAIN	03	BELL Repl. by ABE 06

<sup>1</sup> Reports a double ratio of  $B(B^+ \rightarrow D_{CP(+1)}K^+)/B(B^+ \rightarrow D_{CP(+1)}\pi^+)$  and  $B(B^+ \rightarrow \bar{D}^0K^+)/B(B^+ \rightarrow \bar{D}^0\pi^+)$ ,  $1.13 \pm 0.16 \pm 0.08$ . We multiply by our best value of  $B(B^+ \rightarrow \bar{D}^0K^+)/B(B^+ \rightarrow \bar{D}^0\pi^+) = 0.083 \pm 0.006$ . Our first error is their experiment's error and the second error is systematic error from using our best value.

<sup>2</sup> ABE 06 reports  $[\Gamma(B^+ \rightarrow D_{CP(+1)}K^+)/\Gamma(B^+ \rightarrow D_{CP(+1)}\pi^+)] / [\Gamma(B^+ \rightarrow \bar{D}^0K^+)/\Gamma(B^+ \rightarrow \bar{D}^0\pi^+)] = 1.13 \pm 0.06 \pm 0.08$  which we multiply by our best value  $\Gamma(B^+ \rightarrow \bar{D}^0K^+)/\Gamma(B^+ \rightarrow \bar{D}^0\pi^+) = 0.0769 \pm 0.0025$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>3</sup>  $CP=+1$  eigenstate of  $D^0\bar{D}^0$  system is reconstructed via  $K^+K^-$  and  $\pi^+\pi^-$ .

$$\Gamma(D_{CP(+1)}K^+)/\Gamma(\bar{D}^0K^+) \quad \Gamma_{53}/\Gamma_{52}$$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.518±0.029 OUR AVERAGE</b>			Error includes scale factor of 1.6.
0.504±0.019±0.006	<sup>1</sup> AAIJ	12M	LHCB $pp$ at 7 TeV
0.65 ±0.12 ±0.06	<sup>2</sup> AALTONEN	10A	CDF $p\bar{p}$ at 1.96 TeV
0.590±0.045±0.025	<sup>3</sup> DEL-AMO-SA..10G	BABR	$e^+e^- \rightarrow \gamma(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

0.53 ±0.05 ±0.025	AUBERT	08AA	BABR Repl. by DEL-AMO-SANCHEZ 10G
0.45 ±0.06 ±0.02	AUBERT	06J	BABR Repl. by AUBERT 08AA

<sup>1</sup> AAIJ 12M reports  $R_{CP+} = 1.007 \pm 0.038 \pm 0.012$  which we have divided by 2.

<sup>2</sup> Reports  $R_{CP+} = 2 (B(B^- \rightarrow D_{CP(+1)}K^-) + B(B^+ \rightarrow D_{CP(+1)}K^+)) / (B(B^- \rightarrow D^0K^-) + B(B^+ \rightarrow \bar{D}^0K^+)) = 1.30 \pm 0.24 \pm 0.12$  that we have divided by 2.

<sup>3</sup> Reports  $R_{CP+} = 1.18 \pm 0.09 \pm 0.05$  that we have divided by 2.

$$\Gamma(D_{CP(-1)}K^+)/\Gamma(D_{CP(-1)}\pi^+) \quad \Gamma_{54}/\Gamma_{50}$$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.097±0.016±0.007</b>	<sup>1</sup> ABE	06	BELL $e^+e^- \rightarrow \gamma(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.119±0.028±0.006	<sup>2</sup> ABE	03D	BELL Repl. by SWAIN 03
0.108±0.019±0.007	<sup>2</sup> SWAIN	03	BELL Repl. by ABE 06

<sup>1</sup> Reports a double ratio of  $B(B^+ \rightarrow D_{CP(-1)}K^+)/B(B^+ \rightarrow D_{CP(-1)}\pi^+)$  and  $B(B^+ \rightarrow \bar{D}^0K^+)/B(B^+ \rightarrow \bar{D}^0\pi^+)$ ,  $1.17 \pm 0.14 \pm 0.14$ . We multiply by our best value of  $B(B^+ \rightarrow \bar{D}^0K^+)/B(B^+ \rightarrow \bar{D}^0\pi^+) = 0.083 \pm 0.006$ . Our first error is their experiment's error and the second error is systematic error from using our best value.

<sup>2</sup>  $CP=-1$  eigenstate of  $D^0\bar{D}^0$  system is reconstructed via  $K_S^0\pi^0$ ,  $K_S^0\omega$ ,  $K_S^0\phi$ ,  $K_S^0\eta$ , and  $K_S^0\eta'$ .

$\Gamma(D_{CP(-1)}K^+)/\Gamma(\overline{D}^0K^+)$   $\Gamma_{54}/\Gamma_{52}$

VALUE	DOCUMENT ID	TECN	COMMENT
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**0.54 ± 0.04 ± 0.02** <sup>1</sup> DEL-AMO-SA..10G BABR  $e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

0.515 ± 0.05 ± 0.025 AUBERT 08AA BABR Repl. by DEL-AMO-SANCHEZ 10G

0.43 ± 0.05 ± 0.02 AUBERT 06J BABR Repl. by AUBERT 08AA

<sup>1</sup> Reports  $R_{CP+} = 1.07 \pm 0.08 \pm 0.04$  that we have divided by 2.

$\Gamma([K^-\pi^+]_D K^+)/\Gamma_{total}$   $\Gamma_{55}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
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**< 2.8 × 10<sup>-7</sup>** 90 HORII 08 BELL  $e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

< 6.3 × 10<sup>-7</sup> 90 SAIGO 05 BELL  $e^+e^- \rightarrow \Upsilon(4S)$

$\Gamma([K^-\pi^+]_D K^+)/\Gamma([K^+\pi^-]_D K^+)$   $\Gamma_{55}/\Gamma_{56}$

VALUE (units 10 <sup>-3</sup> )	CL%	DOCUMENT ID	TECN	COMMENT
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**15.3 ± 1.7 OUR AVERAGE**

15.2 ± 2.0 ± 0.4 AAIJ 12M LHCB  $pp$  at 7 TeV

22.0 ± 8.6 ± 2.6 <sup>1</sup> AALTONEN 11AJ CDF  $p\bar{p}$  at 1.96 TeV

16.3 <sup>+4.4 +0.7</sup><sub>-4.1 -1.3</sub> HORII 11 BELL  $e^+e^- \rightarrow \Upsilon(4S)$

11 ± 6 ± 2 DEL-AMO-SA..10H BABR  $e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

7.8 <sup>+6.2 +2.0</sup><sub>-5.7 -2.8</sub> HORII 08 BELL Repl. by HORII 11

< 29 90 <sup>2</sup> AUBERT 05G BABR Repl. by DEL-AMO-SANCHEZ 10H

< 44 90 <sup>3</sup> SAIGO 05 BELL  $e^+e^- \rightarrow \Upsilon(4S)$

< 26 90 <sup>4</sup> AUBERT,B 04L BABR Repl. by AUBERT 05G

<sup>1</sup> AALTONEN 11AJ also measures the ratio separately for  $B^+$  ( $R^+(K)$ ) and  $B^-$  ( $R^-(K)$ ) and obtains:  $R^+(K) = (42.6 \pm 13.7 \pm 2.8) \times 10^{-3}$ ,  $R^-(K) = (3.8 \pm 10.3 \pm 2.7) \times 10^{-3}$ .

<sup>2</sup> AUBERT 05G extract a constraint on the magnitude of the ratio of amplitudes  $|A(B^+ \rightarrow D^0 K^+) / A(B^+ \rightarrow \overline{D}^0 K^+)| < 0.23$  at 90% CL (Bayesian). Similar measurements from  $B^+ \rightarrow D^{*0} K^+$  are also reported.

<sup>3</sup> SAIGO 05 extract a constraint on the magnitude of the ratio of amplitudes  $|A(B^+ \rightarrow D^0 K^+) / A(B^+ \rightarrow \overline{D}^0 K^+)| < 0.27$  at 90% CL.

<sup>4</sup> AUBERT,B 04L extract a constraint on the magnitude of the ratio of amplitudes  $|A(B^+ \rightarrow D^0 K^+) / A(B^+ \rightarrow \overline{D}^0 K^+)| < 0.22$  at 90% CL.

$\Gamma([K^-\pi^+\pi^0]_D K^+)/\Gamma([K^+\pi^-\pi^0]_D K^+)$   $\Gamma_{57}/\Gamma_{58}$

VALUE (units 10 <sup>-3</sup> )	CL%	DOCUMENT ID	TECN	COMMENT
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**16 ± 4 OUR AVERAGE**

14.0 ± 4.7 ± 2.1 <sup>1</sup> AAIJ 15W LHCB  $pp$  at 7, 8 TeV

19.8 ± 6.2 ± 2.4 NAYAK 13 BELL  $e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

< 21 90 <sup>2</sup> LEES 11D BABR  $e^+e^- \rightarrow \Upsilon(4S)$

< 39 95 <sup>3</sup> AUBERT 07BN BABR Repl. by LEES 11D

<sup>1</sup> Uses  $D^0 \rightarrow K^- \pi^+ \pi^0$  for the favored mode, and  $D^0 \rightarrow K^+ \pi^- \pi^0$  for the suppressed mode.

<sup>2</sup> Extracts a constraint on the magnitude of the ratio of amplitudes  $|A(B^+ \rightarrow D^0 K^+)/A(B^+ \rightarrow \bar{D}^0 K^+)| < 0.13$  at 95% CL.

<sup>3</sup> Extracts a constraint on the magnitude of the ratio of amplitudes  $|A(B^+ \rightarrow D^0 K^+)/A(B^+ \rightarrow \bar{D}^0 K^+)| < 0.19$  at 95% CL.

$\Gamma([K^- \pi^+ \pi^+ \pi^-]_D K^+)/\Gamma([K^+ \pi^- \pi^+ \pi^-]_D K^+)$   $\Gamma_{59}/\Gamma_{60}$

<u>VALUE (units <math>10^{-2}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>1.24 ± 0.27</b>	AAIJ	13AE LHCB	$pp$ at 7 TeV

$\Gamma([K^- \pi^+]_D K^*(892)^+)/\Gamma([K^+ \pi^-]_D K^*(892)^+)$   $\Gamma_{61}/\Gamma_{62}$

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.066 ± 0.031 ± 0.010</b>	AUBERT	09AJ BABR	$e^+ e^- \rightarrow \gamma(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

0.046 ± 0.031 ± 0.008	AUBERT,B	05V BABR	Repl. by AUBERT 09AJ
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$\Gamma([K^- \pi^+]_D \pi^+)/\Gamma_{\text{total}}$   $\Gamma_{63}/\Gamma$

<u>VALUE (units <math>10^{-7}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>6.29<sup>+1.02+0.37</sup><sub>-0.98-0.48</sub></b>	HORII	08 BELL	$e^+ e^- \rightarrow \gamma(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

6.6 <sup>+1.9</sup> <sub>-1.7</sub> ± 0.5	SAIGO	05 BELL	Repl. by HORII 08
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$\Gamma([K^- \pi^+]_D \pi^+)/\Gamma([K^+ \pi^-]_D \pi^+)$   $\Gamma_{63}/\Gamma_{64}$

<u>VALUE (units <math>10^{-3}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>3.75 ± 0.26 OUR AVERAGE</b>	Error includes scale factor of 1.3. See the ideogram below.		

4.10 ± 0.25 ± 0.05	AAIJ	12M LHCB	$pp$ at 7 TeV
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2.8 ± 0.7 ± 0.4	<sup>1</sup> AALTONEN	11AJ CDF	$p\bar{p}$ at 1.96 TeV
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3.28 <sup>+0.38+0.12</sup> <sub>-0.36-0.18</sub>	HORII	11 BELL	$e^+ e^- \rightarrow \gamma(4S)$
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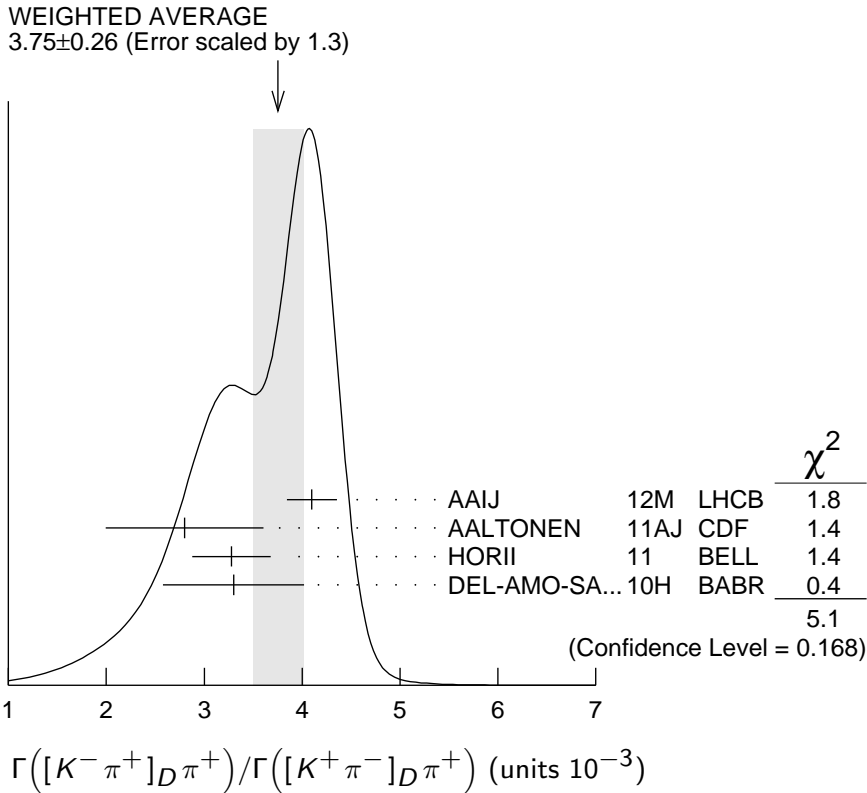
3.3 ± 0.6 ± 0.4	DEL-AMO-SA..10H	BABR	$e^+ e^- \rightarrow \gamma(4S)$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

3.40 <sup>+0.55+0.15</sup> <sub>-0.53-0.22</sub>	HORII	08 BELL	Repl. by HORII 11
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3.5 <sup>+1.0</sup> <sub>-0.9</sub> ± 0.2	SAIGO	05 BELL	Repl. by HORII 08
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<sup>1</sup> AALTONEN 11AJ also measures the ratio separately for  $B^+$  ( $R^+(\pi)$ ) and  $B^-$  ( $R^-(\pi)$ ) and obtains:  $R^+(\pi) = (2.4 \pm 1.0 \pm 0.4) \times 10^{-3}$ ,  $R^-(\pi) = (3.1 \pm 1.1 \pm 0.4) \times 10^{-3}$ .



**$\Gamma([K^-\pi^+\pi^0]_D\pi^+)/\Gamma([K^+\pi^-\pi^0]_D\pi^+)$   $\Gamma_{65}/\Gamma_{66}$**

VALUE (units $10^{-3}$ )	DOCUMENT ID	TECN	COMMENT
<b>2.2 ± 0.4 OUR AVERAGE</b>			
2.35 ± 0.49 ± 0.06	<sup>1</sup> AAIJ	15W	LHCB $pp$ at 7, 8 TeV
1.89 ± 0.54 <sup>+0.22</sup> <sub>-0.25</sub>	NAYAK	13	BELL $e^+e^- \rightarrow \gamma(4S)$

<sup>1</sup> Uses  $D^0 \rightarrow K^-\pi^+\pi^0$  for the favored mode, and  $D^0 \rightarrow K^+\pi^-\pi^0$  for the suppressed mode.

**$\Gamma([K^-\pi^+\pi^+\pi^-]_D\pi^+)/\Gamma([K^+\pi^-\pi^+\pi^-]_D\pi^+)$   $\Gamma_{67}/\Gamma_{68}$**

VALUE (units $10^{-3}$ )	DOCUMENT ID	TECN	COMMENT
<b>3.7 ± 0.4</b>	AAIJ	13AE	LHCB $pp$ at 7 TeV

**$\Gamma([K^-\pi^+]_{(D\pi)}\pi^+)/\Gamma([K^+\pi^-]_{(D\pi)}\pi^+)$   $\Gamma_{69}/\Gamma_{70}$**

VALUE (units $10^{-3}$ )	DOCUMENT ID	TECN	COMMENT
<b>3.2 ± 0.9 ± 0.8</b>	DEL-AMO-SA...10H	BABR	$e^+e^- \rightarrow \gamma(4S)$

**$\Gamma([K^-\pi^+]_{(D\gamma)}\pi^+)/\Gamma([K^+\pi^-]_{(D\gamma)}\pi^+)$   $\Gamma_{71}/\Gamma_{72}$**

VALUE (units $10^{-3}$ )	DOCUMENT ID	TECN	COMMENT
<b>2.7 ± 1.4 ± 2.2</b>	DEL-AMO-SA...10H	BABR	$e^+e^- \rightarrow \gamma(4S)$



$$\Gamma([K^-\pi^+]_{(D\pi)}K^+)/\Gamma([K^+\pi^-]_{(D\pi)}K^+) \quad \Gamma_{73}/\Gamma_{74}$$

VALUE (units $10^{-3}$ )	DOCUMENT ID	TECN	COMMENT
<b>1.8±0.9±0.4</b>	DEL-AMO-SA..10H	BABR	$e^+e^- \rightarrow \Upsilon(4S)$

$$\Gamma([K^-\pi^+]_{(D\gamma)}K^+)/\Gamma([K^+\pi^-]_{(D\gamma)}K^+) \quad \Gamma_{75}/\Gamma_{76}$$

VALUE (units $10^{-3}$ )	DOCUMENT ID	TECN	COMMENT
<b>1.3±1.4±0.8</b>	DEL-AMO-SA..10H	BABR	$e^+e^- \rightarrow \Upsilon(4S)$

$$\Gamma([\pi^+\pi^-\pi^0]_D K^-)/\Gamma_{\text{total}} \quad \Gamma_{77}/\Gamma$$

VALUE (units $10^{-6}$ )	DOCUMENT ID	TECN	COMMENT
<b>4.6±0.8±0.4</b>	<sup>1</sup> AUBERT	07BJ	BABR $e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

5.5±1.0±0.7	<sup>1</sup> AUBERT,B	05T	BABR Repl. by AUBERT 07BJ
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$$\Gamma([K_S^0 K^+\pi^-]_D K^+)/\Gamma([K_S^0 K^+\pi^-]_D \pi^+) \quad \Gamma_{78}/\Gamma_{83}$$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.092±0.009±0.004</b>	<sup>1</sup> AAIJ	14V	LHCB $pp$ at 7, 8 TeV

<sup>1</sup> The analysis uses all of  $D \rightarrow K_S^0 K \pi$  Dalitz decays.

$$\Gamma([K_S^0 K^-\pi^+]_D K^+)/\Gamma([K_S^0 K^-\pi^+]_D \pi^+) \quad \Gamma_{79}/\Gamma_{81}$$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.066±0.009±0.002</b>	<sup>1</sup> AAIJ	14V	LHCB $pp$ at 7, 8 TeV

<sup>1</sup> The analysis uses all of  $D \rightarrow K_S^0 K \pi$  Dalitz decays.

$$\Gamma([K_S^0 K^-\pi^+]_D K^+)/\Gamma([K_S^0 K^+\pi^-]_D \pi^+) \quad \Gamma_{79}/\Gamma_{83}$$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.084±0.011±0.003</b>	<sup>1</sup> AAIJ	14V	LHCB $pp$ at 7, 8 TeV

<sup>1</sup> The Analysis uses  $D \rightarrow K^*(892)K \rightarrow K_S^0 K \pi$  decays.

$$\Gamma([K^*(892)^+ K^-]_D K^+)/\Gamma([K^*(892)^- K^+]_D \pi^+) \quad \Gamma_{80}/\Gamma_{84}$$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.056±0.013±0.002</b>	<sup>1</sup> AAIJ	14V	LHCB $pp$ at 7, 8 TeV

<sup>1</sup> The Analysis uses  $D \rightarrow K^*(892)K \rightarrow K_S^0 K \pi$  decays.

$$\Gamma([K^+ K^-\pi^0]_D K^+)/\Gamma([K^+ K^-\pi^0]_D \pi^+) \quad \Gamma_{85}/\Gamma_{86}$$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.95±0.22±0.05</b>	<sup>1</sup> AAIJ	15W	LHCB $pp$ at 7, 8 TeV

<sup>1</sup> Uses  $D \rightarrow K^+ K^-\pi^0$  mode.

$$\Gamma([\pi^+\pi^-\pi^0]_D K^+)/\Gamma([\pi^+\pi^-\pi^0]_D \pi^+) \quad \Gamma_{87}/\Gamma_{88}$$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.98±0.11±0.05</b>	<sup>1</sup> AAIJ	15W	LHCB $pp$ at 7, 8 TeV

<sup>1</sup> Uses  $D \rightarrow \pi^+\pi^-\pi^0$  mode.

$\Gamma([K_S^0 K^+ \pi^-]_D \pi^+) / \Gamma([K_S^0 K^- \pi^+]_D \pi^+)$   $\Gamma_{83} / \Gamma_{81}$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>1.528 ± 0.058 ± 0.025</b>	<sup>1</sup> AAIJ	14V LHCB	<i>pp</i> at 7, 8 TeV

<sup>1</sup> The analysis uses all of  $D \rightarrow K_S^0 K \pi$  Dalitz decays.

$\Gamma([K^*(892)^- K^+]_D \pi^+) / \Gamma([K^*(892)^+ K^-]_D \pi^+)$   $\Gamma_{84} / \Gamma_{82}$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>2.57 ± 0.13 ± 0.06</b>	<sup>1</sup> AAIJ	14V LHCB	<i>pp</i> at 7, 8 TeV

<sup>1</sup> The Analysis uses  $D \rightarrow K^*(892) K \rightarrow K_S^0 K \pi$  decays.

$\Gamma(\bar{D}^0 K^*(892)^+) / \Gamma_{\text{total}}$   $\Gamma_{89} / \Gamma$

VALUE (units 10 <sup>-4</sup> )	DOCUMENT ID	TECN	COMMENT
<b>5.3 ± 0.4 OUR AVERAGE</b>			
5.29 ± 0.30 ± 0.34	<sup>1</sup> AUBERT	06Z BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
6.1 ± 1.6 ± 1.7	<sup>1</sup> MAHAPATRA	02 CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
6.3 ± 0.7 ± 0.5	<sup>1</sup> AUBERT	04Q BABR	Repl. by AUBERT 06Z

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(D_{CP(-)} K^*(892)^+) / \Gamma(\bar{D}^0 K^*(892)^+)$   $\Gamma_{90} / \Gamma_{89}$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.515 ± 0.135 ± 0.065</b>	<sup>1</sup> AUBERT	09AJ BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.325 ± 0.13 ± 0.04	<sup>2</sup> AUBERT,B	05U BABR	Repl. by AUBERT 09AJ

<sup>1</sup> The authors report  $R_{CP-} = 1.03 \pm 0.27 \pm 0.13$  which is, assuming  $CP$  conservation, twice the value of the quoted above branching ratio,

<sup>2</sup> The authors report  $R_{CP-} = 0.65 \pm 0.26 \pm 0.08$  which is, assuming  $CP$  conservation, twice the value of the quoted above branching ratio.

$\Gamma(D_{CP(+)} K^*(892)^+) / \Gamma(\bar{D}^0 K^*(892)^+)$   $\Gamma_{91} / \Gamma_{89}$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>1.085 ± 0.175 ± 0.045</b>	<sup>1</sup> AUBERT	09AJ BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.98 ± 0.20 ± 0.055	<sup>2</sup> AUBERT,B	05U BABR	Repl. by AUBERT 09AJ

<sup>1</sup> The authors report  $R_{CP+} = 2.17 \pm 0.35 \pm 0.09$  which is, assuming  $CP$  conservation, twice the value of the quoted above branching ratio,

<sup>2</sup> The authors report  $R_{CP+} = 1.96 \pm 0.40 \pm 0.11$  which is, assuming  $CP$  conservation, twice the value of the quoted above branching ratio.

$\Gamma(\bar{D}^0 K^+ \pi^+ \pi^-) / \Gamma(\bar{D}^0 \pi^+ \pi^+ \pi^-)$   $\Gamma_{92} / \Gamma_{98}$

VALUE (units 10 <sup>-2</sup> )	DOCUMENT ID	TECN	COMMENT
<b>9.4 ± 1.3 ± 0.9</b>	AAIJ	12T LHCB	<i>pp</i> at 7 TeV

$\Gamma(D_{CP(+)} K^+ \pi^- \pi^+) / \Gamma([K^+ \pi^-]_D K^+ \pi^- \pi^+)$   $\Gamma_{95} / \Gamma_{93}$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>1.040 ± 0.064</b>	AAIJ	15BC LHCB	<i>pp</i> at 7, 8 TeV

$$\Gamma([K^-\pi^+]_D K^+\pi^-\pi^+)/\Gamma([K^+\pi^-]_D K^+\pi^-\pi^+) \quad \Gamma_{94}/\Gamma_{93}$$

VALUE (units $10^{-4}$ )	DOCUMENT ID	TECN	COMMENT
$85^{+36}_{-33}$	AAIJ	15BC	LHCB $pp$ at 7, 8 TeV

$$\Gamma(\overline{D}^0 K^+ \overline{K}^0)/\Gamma_{\text{total}} \quad \Gamma_{96}/\Gamma$$

VALUE (units $10^{-4}$ )	DOCUMENT ID	TECN	COMMENT
$5.5 \pm 1.4 \pm 0.8$	<sup>1</sup> DRUTSKOY 02	BELL	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$$\Gamma(\overline{D}^0 K^+ \overline{K}^*(892)^0)/\Gamma_{\text{total}} \quad \Gamma_{97}/\Gamma$$

VALUE (units $10^{-4}$ )	DOCUMENT ID	TECN	COMMENT
$7.5 \pm 1.3 \pm 1.1$	<sup>1</sup> DRUTSKOY 02	BELL	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$$\Gamma(\overline{D}^0 \pi^+ \pi^+ \pi^-)/\Gamma_{\text{total}} \quad \Gamma_{98}/\Gamma$$

VALUE	DOCUMENT ID	TECN	COMMENT
$0.0057 \pm 0.0022$ <b>OUR FIT</b>	Error includes scale factor of 3.6.		
$0.0115 \pm 0.0029 \pm 0.0021$	<sup>1</sup> BORTOLETTO92	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> BORTOLETTO 92 assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$  and uses Mark III branching fractions for the  $D$ .

$$\Gamma(\overline{D}^0 \pi^+ \pi^+ \pi^-)/\Gamma(\overline{D}^0 \pi^+) \quad \Gamma_{98}/\Gamma_{48}$$

VALUE	DOCUMENT ID	TECN	COMMENT
$1.2 \pm 0.4$ <b>OUR FIT</b>	Error includes scale factor of 3.8.		
$1.27 \pm 0.06 \pm 0.11$	AAIJ	11E	LHCB $pp$ at 7 TeV

$$\Gamma([K^-\pi^+]_D \pi^+ \pi^-\pi^+)/\Gamma([K^+\pi^-]_D K^+\pi^-\pi^+) \quad \Gamma_{99}/\Gamma_{93}$$

VALUE (units $10^{-4}$ )	DOCUMENT ID	TECN	COMMENT
$42.7 \pm 5.6$	AAIJ	15BC	LHCB $pp$ at 7, 8 TeV

$$\Gamma(\overline{D}^0 \pi^+ \pi^+ \pi^- \text{ nonresonant})/\Gamma_{\text{total}} \quad \Gamma_{100}/\Gamma$$

VALUE	DOCUMENT ID	TECN	COMMENT
$0.0051 \pm 0.0034 \pm 0.0023$	<sup>1</sup> BORTOLETTO92	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> BORTOLETTO 92 assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$  and uses Mark III branching fractions for the  $D$ .

$$\Gamma(\overline{D}^0 \pi^+ \rho^0)/\Gamma_{\text{total}} \quad \Gamma_{101}/\Gamma$$

VALUE	DOCUMENT ID	TECN	COMMENT
$0.0042 \pm 0.0023 \pm 0.0020$	<sup>1</sup> BORTOLETTO92	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> BORTOLETTO 92 assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$  and uses Mark III branching fractions for the  $D$ .

$$\Gamma(\overline{D}^0 a_1(1260)^+)/\Gamma_{\text{total}} \quad \Gamma_{102}/\Gamma$$

VALUE	DOCUMENT ID	TECN	COMMENT
$0.0045 \pm 0.0019 \pm 0.0031$	<sup>1</sup> BORTOLETTO92	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> BORTOLETTO 92 assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$  and uses Mark III branching fractions for the  $D$ .

$\Gamma(\overline{D}^0 \omega \pi^+)/\Gamma_{\text{total}}$   $\Gamma_{103}/\Gamma$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.0041 ± 0.0007 ± 0.0006</b>	<sup>1</sup> ALEXANDER 01B	CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ . The signal is consistent with all observed  $\omega \pi^+$  having proceeded through the  $\rho'^+$  resonance at mass  $1349 \pm 25^{+10}_{-5}$  MeV and width  $547 \pm 86^{+46}_{-45}$  MeV.

$\Gamma(D^{*(2010)-} \pi^+ \pi^+)/\Gamma_{\text{total}}$   $\Gamma_{104}/\Gamma$

VALUE (units $10^{-3}$ )	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
<b>1.35 ± 0.22 OUR AVERAGE</b>					
1.25 ± 0.08 ± 0.22			<sup>1</sup> ABE	04D	BELL $e^+ e^- \rightarrow \Upsilon(4S)$
1.9 ± 0.7 ± 0.3	14		<sup>2</sup> ALAM	94	CLE2 $e^+ e^- \rightarrow \Upsilon(4S)$
2.6 ± 1.4 ± 0.7	11		<sup>3</sup> ALBRECHT	90J	ARG $e^+ e^- \rightarrow \Upsilon(4S)$
2.4 $^{+1.7}_{-1.6}$ $^{+1.0}_{-0.6}$		3	<sup>4</sup> BEBEK	87	CLEO $e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

<4.	90		<sup>5</sup> BORTOLETTO92	CLEO	$e^+ e^- \rightarrow \Upsilon(4S)$
5. ± 2. ± 3.		7	<sup>6</sup> ALBRECHT	87C	ARG $e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> ALAM 94 assume equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$  and use the CLEO II  $B(D^{*(2010)+} \rightarrow D^0 \pi^+)$  and absolute  $B(D^0 \rightarrow K^- \pi^+)$  and the PDG 1992  $B(D^0 \rightarrow K^- \pi^+ \pi^0)/B(D^0 \rightarrow K^- \pi^+)$  and  $B(D^0 \rightarrow K^- 2\pi^+ \pi^-)/B(D^0 \rightarrow K^- \pi^+)$ .

<sup>3</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$  and uses the Mark III branching fractions for the  $D$ .

<sup>4</sup> BEBEK 87 value has been updated in BERKELMAN 91 to use same assumptions as noted for BORTOLETTO 92.

<sup>5</sup> BORTOLETTO 92 assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$  and uses Mark III branching fractions for the  $D$  and  $D^*(2010)$ . The authors also find the product branching fraction into  $D^{**} \pi$  followed by  $D^{**} \rightarrow D^*(2010) \pi$  to be  $0.0014^{+0.0008}_{-0.0006} \pm 0.0003$  where  $D^{**}$  represents all orbitally excited  $D$  mesons.

<sup>6</sup> ALBRECHT 87C use PDG 86 branching ratios for  $D$  and  $D^*(2010)$  and assume  $B(\Upsilon(4S) \rightarrow B^+ B^-) = 55\%$  and  $B(\Upsilon(4S) \rightarrow B^0 \overline{B}^0) = 45\%$ . Superseded by ALBRECHT 90J.

$\Gamma(\overline{D}_1(2420)^0 \pi^+, \overline{D}_1^0 \rightarrow D^{*(2010)-} \pi^+)/\Gamma(\overline{D}^0 \pi^+ \pi^+ \pi^-)$   $\Gamma_{105}/\Gamma_{98}$

VALUE (units $10^{-2}$ )	DOCUMENT ID	TECN	COMMENT
<b>9.3 ± 1.6 ± 0.9</b>	<sup>1</sup> AAIJ	11E	LHCB $pp$ at 7 TeV

<sup>1</sup> AAIJ 11E reports  $(9.3 \pm 1.6 \pm 0.9) \times 10^{-2}$  from a measurement of  $[\Gamma(B^+ \rightarrow \overline{D}_1(2420)^0 \pi^+, \overline{D}_1^0 \rightarrow D^{*(2010)-} \pi^+)/\Gamma(B^+ \rightarrow \overline{D}^0 \pi^+ \pi^+ \pi^-)] \times [B(D^{*(2010)+} \rightarrow D^0 \pi^+)]$  assuming  $B(D^{*(2010)+} \rightarrow D^0 \pi^+) = (67.7 \pm 0.5) \times 10^{-2}$ .

$\Gamma(D^- \pi^+ \pi^+)/\Gamma_{\text{total}}$   $\Gamma_{106}/\Gamma$

VALUE (units $10^{-3}$ )	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
<b>1.07 ± 0.05 OUR AVERAGE</b>					
1.08 ± 0.03 ± 0.05			<sup>1</sup> AUBERT	09AB	BABR $e^+ e^- \rightarrow \Upsilon(4S)$
1.02 ± 0.04 ± 0.15			<sup>1</sup> ABE	04D	BELL $e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

<1.4	90	<sup>2</sup> ALAM	94	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
<7	90	<sup>3</sup> BORTOLETTO	92	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
2.5 $\begin{smallmatrix} +4.1 \\ -2.3 \end{smallmatrix}$ $\begin{smallmatrix} +2.4 \\ -0.8 \end{smallmatrix}$		<sup>4</sup> BEBEK	87	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> ALAM 94 assume equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$  and use the Mark III  $B(D^+ \rightarrow K^- 2\pi^+)$ .

<sup>3</sup> BORTOLETTO 92 assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$  and uses Mark III branching fractions for the  $D$ . The product branching fraction into  $D_0^*(2340)\pi$  followed by  $D_0^*(2340) \rightarrow D\pi$  is  $< 0.005$  at 90%CL and into  $D_2^*(2460)$  followed by  $D_2^*(2460) \rightarrow D\pi$  is  $< 0.004$  at 90%CL.

<sup>4</sup> BEBEK 87 assume the  $\Upsilon(4S)$  decays 43% to  $B^0\bar{B}^0$ .  $B(D^- \rightarrow K^+\pi^-\pi^-) = (9.1 \pm 1.3 \pm 0.4)\%$  is assumed.

$\Gamma(D^- K^+ \pi^+)/\Gamma(D^- \pi^+ \pi^+)$   $\Gamma_{107}/\Gamma_{106}$

VALUE (units $10^{-2}$ )	DOCUMENT ID	TECN	COMMENT
<b>7.20±0.19±0.21</b>	AAIJ	15V	LHCB $pp$ at 7, 8 TeV

$\Gamma(D_0^*(2400)^0 K^+, D_0^{*0} \rightarrow D^- \pi^+)/\Gamma_{total}$   $\Gamma_{108}/\Gamma$

VALUE (units $10^{-4}$ )	DOCUMENT ID	TECN	COMMENT
<b>6.1±1.9±1.5</b>	<sup>1</sup> AAIJ	15V	LHCB $pp$ at 7, 8 TeV

<sup>1</sup> Performs the amplitude analysis by fitting the square-Dalitz-plot distribution.

$\Gamma(D_1^*(2760)^0 K^+, D_1^{*0} \rightarrow D^- \pi^+)/\Gamma_{total}$   $\Gamma_{109}/\Gamma$

VALUE (units $10^{-4}$ )	DOCUMENT ID	TECN	COMMENT
<b>3.6±0.9±0.8</b>	<sup>1</sup> AAIJ	15V	LHCB $pp$ at 7, 8 TeV

<sup>1</sup> Performs the amplitude analysis by fitting the square-Dalitz-plot distribution.

$\Gamma(D_2^*(2460)^0 K^+, D_2^{*0} \rightarrow D^- \pi^+)/\Gamma_{total}$   $\Gamma_{110}/\Gamma$

VALUE (units $10^{-4}$ )	DOCUMENT ID	TECN	COMMENT
<b>23.2±1.1±2.0</b>	<sup>1</sup> AAIJ	15V	LHCB $pp$ at 7, 8 TeV

<sup>1</sup> Performs the amplitude analysis by fitting the square-Dalitz-plot distribution.

$\Gamma(D^+ K^0)/\Gamma_{total}$   $\Gamma_{111}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;2.9</b>	90	<sup>1</sup> DEL-AMO-SA..10K	BABR	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

<5.0	90	<sup>1</sup> AUBERT,B	05E	BABR	Repl. by DEL-AMO-SANCHEZ 10K
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(D^+ K^{*0})/\Gamma_{\text{total}}$   $\Gamma_{112}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;1.8</b>	90	AAIJ	13R	LHCB $pp$ at 7 TeV

• • • We do not use the following data for averages, fits, limits, etc. • • •

<3.0	90	<sup>1</sup> DEL-AMO-SA..10K	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(D^+ \bar{K}^{*0})/\Gamma_{\text{total}}$   $\Gamma_{113}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;1.4</b>	90	AAIJ	13R	LHCB $pp$ at 7 TeV

$\Gamma(\bar{D}^*(2007)^0 \pi^+)/\Gamma_{\text{total}}$   $\Gamma_{114}/\Gamma$

VALUE (units $10^{-3}$ )	EVTS	DOCUMENT ID	TECN	COMMENT
<b>5.18±0.26 OUR AVERAGE</b>				

5.52±0.17±0.42		<sup>1</sup> AUBERT	07H	BABR $e^+ e^- \rightarrow \Upsilon(4S)$
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5.5 ±0.4 ±0.2		<sup>2,3</sup> AUBERT,BE	06J	BABR $e^+ e^- \rightarrow \Upsilon(4S)$
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4.34±0.47±0.18		<sup>4</sup> BRANDENB...	98	CLE2 $e^+ e^- \rightarrow \Upsilon(4S)$
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5.2 ±0.7 ±0.7	71	<sup>5</sup> ALAM	94	CLE2 $e^+ e^- \rightarrow \Upsilon(4S)$
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7.2 ±1.8 ±1.6		<sup>6</sup> BORTOLETTO92	CLEO	$e^+ e^- \rightarrow \Upsilon(4S)$
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4.0 ±1.4 ±1.2	9	<sup>6</sup> ALBRECHT	90J	ARG $e^+ e^- \rightarrow \Upsilon(4S)$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

2.7 ±4.4		<sup>7</sup> BEBEK	87	CLEO $e^+ e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> AUBERT,BE 06J reports  $[\Gamma(B^+ \rightarrow \bar{D}^*(2007)^0 \pi^+)/\Gamma_{\text{total}}] / [B(B^+ \rightarrow \bar{D}^0 \pi^+)] = 1.14 \pm 0.07 \pm 0.04$  which we multiply by our best value  $B(B^+ \rightarrow \bar{D}^0 \pi^+) = (4.80 \pm 0.15) \times 10^{-3}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>3</sup> Uses a missing-mass method. Does not depend on  $D$  branching fractions or  $B^+/B^0$  production rates.

<sup>4</sup> BRANDENBURG 98 assume equal production of  $B^+$  and  $B^0$  at  $\Upsilon(4S)$  and use the  $D^*$  reconstruction technique. The first error is their experiment's error and the second error is the systematic error from the PDG 96 value of  $B(D^* \rightarrow D\pi)$ .

<sup>5</sup> ALAM 94 assume equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$  and use the CLEO II  $B(D^*(2007)^0 \rightarrow D^0 \pi^0)$  and absolute  $B(D^0 \rightarrow K^- \pi^+)$  and the PDG 1992  $B(D^0 \rightarrow K^- \pi^+ \pi^0)/B(D^0 \rightarrow K^- \pi^+)$  and  $B(D^0 \rightarrow K^- 2\pi^+ \pi^-)/B(D^0 \rightarrow K^- \pi^+)$ .

<sup>6</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$  and uses Mark III branching fractions for the  $D$  and  $D^*(2010)$ .

<sup>7</sup> This is a derived branching ratio, using the inclusive pion spectrum and other two-body  $B$  decays. BEBEK 87 assume the  $\Upsilon(4S)$  decays 43% to  $B^0 \bar{B}^0$ .

$\Gamma(\bar{D}^*(2007)^0 \omega \pi^+)/\Gamma_{\text{total}}$   $\Gamma_{117}/\Gamma$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.0045±0.0010±0.0007</b>	<sup>1</sup> ALEXANDER	01B	CLE2 $e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ . The signal is consistent with all observed  $\omega \pi^+$  having proceeded through the  $\rho'^+$  resonance at mass  $1349 \pm 25^{+10}_{-5}$  MeV and width  $547 \pm 86^{+46}_{-45}$  MeV.

$$\Gamma(\bar{D}^*(2007)^0 \rho^+)/\Gamma_{\text{total}} \qquad \Gamma_{118}/\Gamma$$

<u>VALUE</u>	<u>EVT</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.0098 ± 0.0017 OUR AVERAGE</b>				
0.0098 ± 0.0006 ± 0.0017		<sup>1</sup> CSORNA	03 CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$
0.010 ± 0.006 ± 0.004	7	<sup>2</sup> ALBRECHT	90J ARG	$e^+ e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.0168 ± 0.0021 ± 0.0028	86	<sup>3</sup> ALAM	94 CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^0$  and  $B^+$  at the  $\Upsilon(4S)$  resonance. The second error combines the systematic and theoretical uncertainties in quadrature. CSORNA 03 includes data used in ALAM 94. A full angular fit to three complex helicity amplitudes is performed.

<sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$  and uses Mark III branching fractions for the  $D$  and  $D^*(2010)$ .

<sup>3</sup> ALAM 94 assume equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$  and use the CLEO II  $B(D^*(2007)^0 \rightarrow D^0 \pi^0)$  and absolute  $B(D^0 \rightarrow K^- \pi^+)$  and the PDG 1992  $B(D^0 \rightarrow K^- \pi^+ \pi^0)/B(D^0 \rightarrow K^- \pi^+)$  and  $B(D^0 \rightarrow K^- 2\pi^+ \pi^-)/B(D^0 \rightarrow K^- \pi^+)$ . The nonresonant  $\pi^+ \pi^0$  contribution under the  $\rho^+$  is negligible.

$$\Gamma(\bar{D}^*(2007)^0 K^+)/\Gamma_{\text{total}} \qquad \Gamma_{119}/\Gamma$$

<u>VALUE (units <math>10^{-4}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>4.20 ± 0.34 OUR AVERAGE</b>			
4.21 <sup>+0.30</sup> <sub>-0.26</sub> ± 0.21	<sup>1</sup> AUBERT	05N BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
4.0 ± 1.1 ± 0.2	<sup>2</sup> ABE	01I BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> AUBERT 05N reports  $[\Gamma(B^+ \rightarrow \bar{D}^*(2007)^0 K^+)/\Gamma_{\text{total}}] / [B(B^+ \rightarrow \bar{D}^*(2007)^0 \pi^+)] = 0.0813 \pm 0.0040^{+0.0042}_{-0.0031}$  which we multiply by our best value  $B(B^+ \rightarrow \bar{D}^*(2007)^0 \pi^+) = (5.18 \pm 0.26) \times 10^{-3}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>2</sup> ABE 01I reports  $[\Gamma(B^+ \rightarrow \bar{D}^*(2007)^0 K^+)/\Gamma_{\text{total}}] / [B(B^+ \rightarrow \bar{D}^*(2007)^0 \pi^+)] = 0.078 \pm 0.019 \pm 0.009$  which we multiply by our best value  $B(B^+ \rightarrow \bar{D}^*(2007)^0 \pi^+) = (5.18 \pm 0.26) \times 10^{-3}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

$$\Gamma(\bar{D}_{CP(+1)}^{*0} K^+)/\Gamma_{\text{total}} \qquad \Gamma_{120}/\Gamma$$

<u>VALUE (units <math>10^{-4}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>2.75 ± 0.29<sup>+0.23</sup><sub>-0.22</sub></b>			
	<sup>1</sup> AUBERT	08BF BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> AUBERT 08BF reports  $[\Gamma(B^+ \rightarrow \bar{D}_{CP(+1)}^{*0} K^+)/\Gamma_{\text{total}}] / [B(B^+ \rightarrow \bar{D}^*(2007)^0 K^+)] = 0.655 \pm 0.065 \pm 0.020$  which we multiply by our best value  $B(B^+ \rightarrow \bar{D}^*(2007)^0 K^+) = (4.20 \pm 0.34) \times 10^{-4}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

$$\Gamma(\bar{D}_{CP(+1)}^{*0} K^+)/\Gamma(\bar{D}_{CP(+1)}^{*0} \pi^+) \qquad \Gamma_{120}/\Gamma_{115}$$

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.095 ± 0.017 OUR AVERAGE</b>			
0.11 ± 0.02 ± 0.02	<sup>1</sup> ABE	06 BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
0.086 ± 0.021 ± 0.007	<sup>2</sup> AUBERT	05N BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Reports a double ratio of  $B(B^+ \rightarrow D_{CP(+1)}^{*0} K^+)/B(B^+ \rightarrow D_{CP(+1)}^{*0} \pi^+)$  and  $B(B^+ \rightarrow \bar{D}^{*0} K^+)/B(B^+ \rightarrow \bar{D}^{*0} \pi^+)$ ,  $1.41 \pm 0.25 \pm 0.06$ . We multiply by our best value of  $B(B^+ \rightarrow \bar{D}^{*0} K^+)/B(B^+ \rightarrow \bar{D}^{*0} \pi^+) = 0.080 \pm 0.011$ . Our first error is their experiment's error and the second error is systematic error from using our best value.

<sup>2</sup> Uses  $D^{*0} \rightarrow D^0 \pi^0$  with  $D^0$  reconstructed in the  $CP$ -even eigenstates  $K^+ K^-$  and  $\pi^+ \pi^-$ .

### $\Gamma(\bar{D}_{CP(-1)}^{*0} K^+)/\Gamma_{\text{total}}$ $\Gamma_{121}/\Gamma$

<u>VALUE (units <math>10^{-4}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>2.31 \pm 0.27^{+0.20}_{-0.18}</math></b>	<sup>1</sup> AUBERT	08BF BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> AUBERT 08BF reports  $[\Gamma(B^+ \rightarrow \bar{D}_{CP(-1)}^{*0} K^+)/\Gamma_{\text{total}}] / [B(B^+ \rightarrow \bar{D}^*(2007)^0 K^+)] = 0.55 \pm 0.06 \pm 0.02$  which we multiply by our best value  $B(B^+ \rightarrow \bar{D}^*(2007)^0 K^+) = (4.20 \pm 0.34) \times 10^{-4}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

### $\Gamma(\bar{D}_{CP(-1)}^{*0} K^+)/\Gamma(D_{CP(-1)}^{*0} \pi^+)$ $\Gamma_{121}/\Gamma_{116}$

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>0.09 \pm 0.03 \pm 0.01</math></b>	<sup>1</sup> ABE	06 BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Reports a double ratio of  $B(B^+ \rightarrow (D_{CP(-1)}^*)^0 K^+)/B(B^+ \rightarrow (D_{CP(-1)}^*)^0 \pi^+)$  and  $B(B^+ \rightarrow \bar{D}^{*0} K^+)/B(B^+ \rightarrow \bar{D}^{*0} \pi^+)$ ,  $1.15 \pm 0.31 \pm 0.12$ . We multiply by our best value of  $B(B^+ \rightarrow \bar{D}^{*0} K^+)/B(B^+ \rightarrow \bar{D}^{*0} \pi^+) = 0.080 \pm 0.011$ . Our first error is their experiment's error and the second error is systematic error from using our best value.

### $\Gamma(\bar{D}^*(2007)^0 K^*(892)^+)/\Gamma_{\text{total}}$ $\Gamma_{122}/\Gamma$

<u>VALUE (units <math>10^{-4}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>8.1 \pm 1.4</math> OUR AVERAGE</b>			
$8.3 \pm 1.1 \pm 1.0$	<sup>1</sup> AUBERT	04k BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
$7.2 \pm 2.2 \pm 2.6$	<sup>2</sup> MAHAPATRA	02 CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$  and an unpolarized final state.

### $\Gamma(\bar{D}^*(2007)^0 K^+ \bar{K}^0)/\Gamma_{\text{total}}$ $\Gamma_{123}/\Gamma$

<u>VALUE (units <math>10^{-4}</math>)</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>&lt;10.6</math></b>	90	<sup>1</sup> DRUTSKOY	02 BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

### $\Gamma(\bar{D}^*(2007)^0 K^+ K^*(892)^0)/\Gamma_{\text{total}}$ $\Gamma_{124}/\Gamma$

<u>VALUE (units <math>10^{-4}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>15.3 \pm 3.1 \pm 2.9</math></b>	<sup>1</sup> DRUTSKOY	02 BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .



$\Gamma(\bar{D}^*(2007)^0 \pi^+ \pi^+ \pi^-) / \Gamma_{\text{total}}$   $\Gamma_{125} / \Gamma$

VALUE (units $10^{-2}$ )	EVTS	DOCUMENT ID	TECN	COMMENT
<b>1.03 ± 0.12 OUR AVERAGE</b>				
1.055 ± 0.047 ± 0.129		<sup>1</sup> MAJUMDER 04	BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
0.94 ± 0.20 ± 0.17	48	<sup>2,3</sup> ALAM 94	CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> ALAM 94 assume equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$  and use the CLEO II  $B(D^*(2007)^0 \rightarrow D^0 \pi^0)$  and absolute  $B(D^0 \rightarrow K^- \pi^+)$  and the PDG 1992  $B(D^0 \rightarrow K^- \pi^+ \pi^0) / B(D^0 \rightarrow K^- \pi^+)$  and  $B(D^0 \rightarrow K^- 2\pi^+ \pi^-) / B(D^0 \rightarrow K^- \pi^+)$ .

<sup>3</sup> The three pion mass is required to be between 1.0 and 1.6 GeV consistent with an  $a_1$  meson. (If this channel is dominated by  $a_1^+$ , the branching ratio for  $\bar{D}^{*0} a_1^+$  is twice that for  $\bar{D}^{*0} \pi^+ \pi^+ \pi^-$ .)

$\Gamma(\bar{D}^*(2007)^0 a_1(1260)^+) / \Gamma_{\text{total}}$   $\Gamma_{126} / \Gamma$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.0188 ± 0.0040 ± 0.0034</b>	<sup>1,2</sup> ALAM 94	CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> ALAM 94 value is twice their  $\Gamma(\bar{D}^*(2007)^0 \pi^+ \pi^+ \pi^-) / \Gamma_{\text{total}}$  value based on their observation that the three pions are dominantly in the  $a_1(1260)$  mass range 1.0 to 1.6 GeV.

<sup>2</sup> ALAM 94 assume equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$  and use the CLEO II  $B(D^*(2007)^0 \rightarrow D^0 \pi^0)$  and absolute  $B(D^0 \rightarrow K^- \pi^+)$  and the PDG 1992  $B(D^0 \rightarrow K^- \pi^+ \pi^0) / B(D^0 \rightarrow K^- \pi^+)$  and  $B(D^0 \rightarrow K^- 2\pi^+ \pi^-) / B(D^0 \rightarrow K^- \pi^+)$ .

$\Gamma(\bar{D}^*(2007)^0 \pi^- \pi^+ \pi^+ \pi^0) / \Gamma_{\text{total}}$   $\Gamma_{127} / \Gamma$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.0180 ± 0.0024 ± 0.0027</b>	<sup>1</sup> ALEXANDER 01B	CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ . The signal is consistent with all observed  $\omega \pi^+$  having proceeded through the  $\rho'^+$  resonance at mass  $1349 \pm 25^{+10}_{-5}$  MeV and width  $547 \pm 86^{+46}_{-45}$  MeV.

$\Gamma(\bar{D}^{*0} 3\pi^+ 2\pi^-) / \Gamma_{\text{total}}$   $\Gamma_{128} / \Gamma$

VALUE (units $10^{-3}$ )	DOCUMENT ID	TECN	COMMENT
<b>5.67 ± 0.91 ± 0.85</b>	<sup>1</sup> MAJUMDER 04	BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(D^*(2010)^+ \pi^0) / \Gamma_{\text{total}}$   $\Gamma_{129} / \Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt; 3.6 × 10<sup>-6</sup></b>		<sup>1</sup> IWABUCHI 08	BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

< 1.7 × 10 <sup>-4</sup>	90	<sup>2</sup> BRANDENB... 98	CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> BRANDENBURG 98 assume equal production of  $B^+$  and  $B^0$  at  $\Upsilon(4S)$  and use the  $D^*$  partial reconstruction technique. The first error is their experiment's error and the second error is the systematic error from the PDG 96 value of  $B(D^* \rightarrow D\pi)$ .

$$\Gamma(D^*(2010)^+ K^0)/\Gamma_{\text{total}} \qquad \Gamma_{130}/\Gamma$$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
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$<9.0 \times 10^{-6}$	90	<sup>1</sup> AUBERT,B 05E	BABR	$e^+e^- \rightarrow \Upsilon(4S)$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

$<9.5 \times 10^{-5}$	90	<sup>1</sup> GRITSAN 01	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$$\Gamma(D^*(2010)^- \pi^+ \pi^+ \pi^0)/\Gamma_{\text{total}} \qquad \Gamma_{131}/\Gamma$$

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
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$0.0152 \pm 0.0071 \pm 0.0001$	26	<sup>1</sup> ALBRECHT 90J	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

$0.043 \pm 0.013 \pm 0.026$	24	<sup>2</sup> ALBRECHT 87C	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> ALBRECHT 90J reports  $0.018 \pm 0.007 \pm 0.005$  from a measurement of  $[\Gamma(B^+ \rightarrow D^*(2010)^- \pi^+ \pi^+ \pi^0)/\Gamma_{\text{total}}] \times [B(D^*(2010)^+ \rightarrow D^0 \pi^+)]$  assuming  $B(D^*(2010)^+ \rightarrow D^0 \pi^+) = 0.57 \pm 0.06$ , which we rescale to our best value  $B(D^*(2010)^+ \rightarrow D^0 \pi^+) = (67.7 \pm 0.5) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$  and uses Mark III branching fractions for the  $D$ .

<sup>2</sup> ALBRECHT 87C use PDG 86 branching ratios for  $D$  and  $D^*(2010)$  and assume  $B(\Upsilon(4S) \rightarrow B^+ B^-) = 55\%$  and  $B(\Upsilon(4S) \rightarrow B^0 \bar{B}^0) = 45\%$ . Superseded by ALBRECHT 90J.

$$\Gamma(D^*(2010)^- \pi^+ \pi^+ \pi^+ \pi^-)/\Gamma_{\text{total}} \qquad \Gamma_{132}/\Gamma$$

VALUE (units $10^{-3}$ )	CL%	DOCUMENT ID	TECN	COMMENT
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$2.56 \pm 0.26 \pm 0.33$		<sup>1</sup> MAJUMDER 04	BELL	$e^+e^- \rightarrow \Upsilon(4S)$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

$<10$	90	<sup>2</sup> ALBRECHT 90J	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$  and uses Mark III branching fractions for the  $D$  and  $D^*(2010)$ .

$$\Gamma(\bar{D}^{*0} \pi^+)/\Gamma_{\text{total}} \qquad \Gamma_{133}/\Gamma$$

$\bar{D}^{*0}$  represents an excited state with mass  $2.2 < M < 2.8 \text{ GeV}/c^2$ .

VALUE (units $10^{-3}$ )	DOCUMENT ID	TECN	COMMENT
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$5.9 \pm 1.3 \pm 0.2$	<sup>1,2</sup> AUBERT,BE 06J	BABR	$e^+e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> AUBERT,BE 06J reports  $[\Gamma(B^+ \rightarrow \bar{D}^{*0} \pi^+)/\Gamma_{\text{total}}] / [B(B^+ \rightarrow \bar{D}^0 \pi^+)] = 1.22 \pm 0.13 \pm 0.23$  which we multiply by our best value  $B(B^+ \rightarrow \bar{D}^0 \pi^+) = (4.80 \pm 0.15) \times 10^{-3}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>2</sup> Uses a missing-mass method. Does not depend on  $D$  branching fractions or  $B^+/B^0$  production rates.

$\Gamma(\overline{D}_1^*(2420)^0 \pi^+)/\Gamma_{\text{total}}$   $\Gamma_{134}/\Gamma$

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.0015 ± 0.0006 OUR AVERAGE</b>				Error includes scale factor of 1.3.
0.0011 ± 0.0005 ± 0.0002	8	<sup>1</sup> ALAM	94 CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
0.0025 ± 0.0007 ± 0.0006		<sup>2</sup> ALBRECHT	94D ARG	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> ALAM 94 assume equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$  and use the CLEO II  $B(D^*(2010)^+ \rightarrow D^0 \pi^+)$  and absolute  $B(D^0 \rightarrow K^- \pi^+)$  and the PDG 1992  $B(D^0 \rightarrow K^- \pi^+ \pi^0)/B(D^0 \rightarrow K^- \pi^+)$  and assuming  $B(D_1(2420)^0 \rightarrow D^*(2010)^+ \pi^-) = 67\%$ .

<sup>2</sup> ALBRECHT 94D assume equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$  and use the CLEO II  $B(D^*(2010)^+ \rightarrow D^0 \pi^+)$  assuming  $B(D_1(2420)^0 \rightarrow D^*(2010)^+ \pi^-) = 67\%$ .

$\Gamma(\overline{D}_1(2420)^0 \pi^+ \times B(\overline{D}_1^0 \rightarrow \overline{D}^0 \pi^+ \pi^-))/\Gamma_{\text{total}}$   $\Gamma_{135}/\Gamma$

VALUE (units $10^{-4}$ )	DOCUMENT ID	TECN	COMMENT
<b>2.5 <sup>+1.6</sup>/<sub>-1.4</sub> OUR FIT</b>			Error includes scale factor of 4.0.

<b>1.85 ± 0.29 <sup>+0.35</sup>/<sub>-0.55</sub></b>	<sup>1</sup> ABE	05A BELL	$e^+e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\overline{D}_1(2420)^0 \pi^+ \times B(\overline{D}_1^0 \rightarrow \overline{D}^0 \pi^+ \pi^+ \pi^-))/\Gamma(\overline{D}^0 \pi^+ \pi^+ \pi^-)$   $\Gamma_{135}/\Gamma_{98}$

VALUE (units $10^{-2}$ )	DOCUMENT ID	TECN	COMMENT
<b>4.4 <sup>+3.3</sup>/<sub>-2.6</sub> OUR FIT</b>			Error includes scale factor of 4.0.

<b>10.3 ± 1.5 ± 0.9</b>	AAIJ	11E LHCB	$pp$ at 7 TeV
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$\Gamma(\overline{D}_1(2420)^0 \pi^+ \times B(\overline{D}_1^0 \rightarrow \overline{D}^0 \pi^+ \pi^- (\text{nonresonant}))) / \Gamma(\overline{D}^0 \pi^+ \pi^+ \pi^-)$   $\Gamma_{136}/\Gamma_{98}$

VALUE (units $10^{-2}$ )	DOCUMENT ID	TECN	COMMENT
<b>4.0 ± 0.7 ± 0.5</b>	<sup>1</sup> AAIJ	11E LHCB	$pp$ at 7 TeV

<sup>1</sup> Excludes decays where  $\overline{D}_1(2420)^0 \rightarrow D^*(2010)^- \pi^+$ .

$\Gamma(\overline{D}_2^*(2462)^0 \pi^+ \times B(\overline{D}_2^*(2462)^0 \rightarrow D^- \pi^+))/\Gamma_{\text{total}}$   $\Gamma_{137}/\Gamma$

VALUE (units $10^{-4}$ )	DOCUMENT ID	TECN	COMMENT
<b>3.5 ± 0.4 OUR AVERAGE</b>			
3.5 ± 0.2 ± 0.4	<sup>1</sup> AUBERT	09AB BABR	$e^+e^- \rightarrow \Upsilon(4S)$
3.4 ± 0.3 ± 0.72	<sup>1</sup> ABE	04D BELL	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\overline{D}_2^*(2462)^0 \pi^+ \times B(\overline{D}_2^0 \rightarrow \overline{D}^0 \pi^- \pi^+))/\Gamma(\overline{D}^0 \pi^+ \pi^+ \pi^-)$   $\Gamma_{138}/\Gamma_{98}$

VALUE (units $10^{-2}$ )	DOCUMENT ID	TECN	COMMENT
<b>4.0 ± 1.0 ± 0.4</b>	AAIJ	11E LHCB	$pp$ at 7 TeV

$\Gamma(\overline{D}_2^*(2462)^0 \pi^+ \times B(\overline{D}_2^0 \rightarrow \overline{D}^0 \pi^- \pi^+ (\text{nonresonant}))) / \Gamma(\overline{D}^0 \pi^+ \pi^+ \pi^-)$   $\Gamma_{139}/\Gamma_{98}$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt; 3.0 × 10<sup>-2</sup></b>	90	<sup>1</sup> AAIJ	11E LHCB	$pp$ at 7 TeV

<sup>1</sup> Excludes decays where  $\overline{D}_2^*(2462)^0 \rightarrow D^*(2010)^- \pi^+$ .

$$\Gamma(\overline{D}_2^*(2462)^0 \pi^+ \times B(\overline{D}_2^{*0} \rightarrow D^*(2010)^- \pi^+)) / \Gamma(\overline{D}^0 \pi^+ \pi^+ \pi^-) \quad \Gamma_{140}/\Gamma_{98}$$

VALUE (units $10^{-2}$ )	DOCUMENT ID	TECN	COMMENT
<b>3.9±1.2±0.4</b>	<sup>1</sup> AAIJ	11E LHCB	$p p$ at 7 TeV

<sup>1</sup> Uses  $B(D^*(2010)^+ \rightarrow D^0 \pi^+) = (67.7 \pm 0.5)\%$ .

$$\Gamma(\overline{D}_0^*(2400)^0 \pi^+ \times B(\overline{D}_0^{*0}(2400)^0 \rightarrow D^- \pi^+)) / \Gamma_{\text{total}} \quad \Gamma_{141}/\Gamma$$

VALUE (units $10^{-4}$ )	DOCUMENT ID	TECN	COMMENT
<b>6.4±1.4 OUR AVERAGE</b>			
6.8±0.3±2.0	<sup>1</sup> AUBERT	09AB BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
6.1±0.6±1.8	<sup>1</sup> ABE	04D BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$$\Gamma(\overline{D}_1(2421)^0 \pi^+ \times B(\overline{D}_1(2421)^0 \rightarrow D^{*-} \pi^+)) / \Gamma_{\text{total}} \quad \Gamma_{142}/\Gamma$$

VALUE (units $10^{-4}$ )	DOCUMENT ID	TECN	COMMENT
<b>6.8±0.7±1.3</b>	<sup>1</sup> ABE	04D BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$$\Gamma(\overline{D}_2^*(2462)^0 \pi^+ \times B(\overline{D}_2^{*0}(2462)^0 \rightarrow D^{*-} \pi^+)) / \Gamma_{\text{total}} \quad \Gamma_{143}/\Gamma$$

VALUE (units $10^{-4}$ )	DOCUMENT ID	TECN	COMMENT
<b>1.8±0.3±0.4</b>	<sup>1</sup> ABE	04D BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$$\Gamma(\overline{D}'_1(2427)^0 \pi^+ \times B(\overline{D}'_1(2427)^0 \rightarrow D^{*-} \pi^+)) / \Gamma_{\text{total}} \quad \Gamma_{144}/\Gamma$$

VALUE (units $10^{-4}$ )	DOCUMENT ID	TECN	COMMENT
<b>5.0±0.4±1.1</b>	<sup>1</sup> ABE	04D BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$$\Gamma(\overline{D}_1(2420)^0 \pi^+ \times B(\overline{D}_1^0 \rightarrow \overline{D}^{*0} \pi^+ \pi^-)) / \Gamma_{\text{total}} \quad \Gamma_{145}/\Gamma$$

VALUE (units $10^{-4}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;0.06</b>	90	<sup>1</sup> ABE	05A BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$$\Gamma(\overline{D}_1^*(2420)^0 \rho^+) / \Gamma_{\text{total}} \quad \Gamma_{146}/\Gamma$$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;0.0014</b>	90	<sup>1</sup> ALAM	94 CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> ALAM 94 assume equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$  and use the CLEO II  $B(D^*(2010)^+ \rightarrow D^0 \pi^+)$  assuming  $B(D_1(2420)^0 \rightarrow D^*(2010)^+ \pi^-) = 67\%$ .

$$\Gamma(\overline{D}_2^*(2460)^0 \pi^+) / \Gamma_{\text{total}} \quad \Gamma_{147}/\Gamma$$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;0.0013</b>	90	<sup>1</sup> ALAM	94 CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

<0.0028	90	<sup>2</sup> ALAM	94 CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$
<0.0023	90	<sup>3</sup> ALBRECHT	94D ARG	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> ALAM 94 assume equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$  and use the Mark III  $B(D^+ \rightarrow K^- 2\pi^+)$  and  $B(D_2^*(2460)^0 \rightarrow D^+ \pi^-) = 30\%$ .

<sup>2</sup> ALAM 94 assume equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$  and use the Mark III  $B(D^+ \rightarrow K^- 2\pi^+)$ , the CLEO II  $B(D^*(2010)^+ \rightarrow D^0 \pi^+)$  and  $B(D_2^*(2460)^0 \rightarrow D^*(2010)^+ \pi^-) = 20\%$ .

<sup>3</sup> ALBRECHT 94D assume equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$  and use the CLEO II  $B(D^*(2010)^+ \rightarrow D^0 \pi^+)$  and  $B(D_2^*(2460)^0 \rightarrow D^*(2010)^+ \pi^-) = 30\%$ .

$\Gamma(\overline{D}_2^*(2460)^0 \pi^+ \times B(\overline{D}_2^{*0} \rightarrow \overline{D}^{*0} \pi^+ \pi^-))/\Gamma_{\text{total}}$   $\Gamma_{148}/\Gamma$

VALUE (units $10^{-4}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;0.22</b>	90	<sup>1</sup> ABE	05A BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\overline{D}_2^*(2460)^0 \rho^+)/\Gamma_{\text{total}}$   $\Gamma_{149}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;0.0047</b>	90	<sup>1</sup> ALAM	94 CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$
<0.005	90	<sup>2</sup> ALAM	94 CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> ALAM 94 assume equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$  and use the Mark III  $B(D^+ \rightarrow K^- 2\pi^+)$  and  $B(D_2^*(2460)^0 \rightarrow D^+ \pi^-) = 30\%$ .

<sup>2</sup> ALAM 94 assume equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$  and use the Mark III  $B(D^+ \rightarrow K^- 2\pi^+)$ , the CLEO II  $B(D^*(2010)^+ \rightarrow D^0 \pi^+)$  and  $B(D_2^*(2460)^0 \rightarrow D^*(2010)^+ \pi^-) = 20\%$ .

$\Gamma(\overline{D}^0 D_s^+)/\Gamma_{\text{total}}$   $\Gamma_{150}/\Gamma$

VALUE (units $10^{-3}$ )	DOCUMENT ID	TECN	COMMENT
<b>9.0±0.9 OUR AVERAGE</b>			
8.6±0.2±1.1	<sup>1</sup> AAIJ	13AP LHCb	$pp$ at 7 TeV
9.5±2.0±0.8	<sup>2</sup> AUBERT	06N BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
9.8±2.6±0.9	<sup>3</sup> GIBAUT	96 CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$
14 ±8 ±1	<sup>4</sup> ALBRECHT	92G ARG	$e^+ e^- \rightarrow \Upsilon(4S)$
13 ±6 ±1	<sup>5</sup> BORTOLETTO90	CLEO	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Uses  $B(B^0 \rightarrow D^- D_s^+) = (7.2 \pm 0.8) \times 10^{-3}$ .

<sup>2</sup> AUBERT 06N reports  $(0.92 \pm 0.14 \pm 0.18) \times 10^{-2}$  from a measurement of  $[\Gamma(B^+ \rightarrow \overline{D}^0 D_s^+)/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi \pi^+)]$  assuming  $B(D_s^+ \rightarrow \phi \pi^+) = 0.0462 \pm 0.0062$ , which we rescale to our best value  $B(D_s^+ \rightarrow \phi \pi^+) = (4.5 \pm 0.4) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>3</sup> GIBAUT 96 reports  $0.0126 \pm 0.0022 \pm 0.0025$  from a measurement of  $[\Gamma(B^+ \rightarrow \overline{D}^0 D_s^+)/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi \pi^+)]$  assuming  $B(D_s^+ \rightarrow \phi \pi^+) = 0.035$ , which we rescale to our best value  $B(D_s^+ \rightarrow \phi \pi^+) = (4.5 \pm 0.4) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>4</sup> ALBRECHT 92G reports  $0.024 \pm 0.012 \pm 0.004$  from a measurement of  $[\Gamma(B^+ \rightarrow \overline{D}^0 D_s^+)/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi \pi^+)]$  assuming  $B(D_s^+ \rightarrow \phi \pi^+) = 0.027$ , which we rescale to our best value  $B(D_s^+ \rightarrow \phi \pi^+) = (4.5 \pm 0.4) \times 10^{-2}$ . Our first error is their

experiment's error and our second error is the systematic error from using our best value.

Assumes PDG 1990  $D^0$  branching ratios, e.g.,  $B(D^0 \rightarrow K^- \pi^+) = 3.71 \pm 0.25\%$ .

<sup>5</sup> BORTOLETTO 90 reports  $0.029 \pm 0.013$  from a measurement of  $[\Gamma(B^+ \rightarrow \bar{D}^0 D_s^+)/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi \pi^+)]$  assuming  $B(D_s^+ \rightarrow \phi \pi^+) = 0.02$ , which we rescale to our best value  $B(D_s^+ \rightarrow \phi \pi^+) = (4.5 \pm 0.4) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(D_{s0}^*(2317)^+ \bar{D}^0, D_{s0}^{*+} \rightarrow D_s^+ \pi^0)/\Gamma_{\text{total}}$   $\Gamma_{151}/\Gamma$

<u>VALUE (units <math>10^{-3}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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**$0.79^{+0.15}_{-0.13}$  OUR AVERAGE**

$0.79^{+0.17}_{-0.16} \pm 0.02$  1,2 CHOI 15A BELL  $e^+ e^- \rightarrow \Upsilon(4S)$

$0.80^{+0.35}_{-0.21} \pm 0.07$  2,3 AUBERT,B 04S BABR  $e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$0.65^{+0.26}_{-0.24} \pm 0.06$  2,4 KROKOVNY 03B BELL Repl. by CHOI 15A

<sup>1</sup> CHOI 15A reports  $(8.0^{+1.3}_{-1.2} \pm 1.1 \pm 0.4) \times 10^{-4}$  from a measurement of  $[\Gamma(B^+ \rightarrow D_{s0}^*(2317)^+ \bar{D}^0, D_{s0}^{*+} \rightarrow D_s^+ \pi^0)/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow K^+ K^- \pi^+)]$  assuming  $B(D_s^+ \rightarrow K^+ K^- \pi^+) = (5.39 \pm 0.21) \times 10^{-2}$ , which we rescale to our best value  $B(D_s^+ \rightarrow K^+ K^- \pi^+) = (5.45 \pm 0.17) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>3</sup> AUBERT,B 04S reports  $(1.0 \pm 0.3^{+0.4}_{-0.2}) \times 10^{-3}$  from a measurement of  $[\Gamma(B^+ \rightarrow D_{s0}^*(2317)^+ \bar{D}^0, D_{s0}^{*+} \rightarrow D_s^+ \pi^0)/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi \pi^+)]$  assuming  $B(D_s^+ \rightarrow \phi \pi^+) = 0.036 \pm 0.009$ , which we rescale to our best value  $B(D_s^+ \rightarrow \phi \pi^+) = (4.5 \pm 0.4) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>4</sup> KROKOVNY 03B reports  $(0.81^{+0.30}_{-0.27} \pm 0.24) \times 10^{-3}$  from a measurement of  $[\Gamma(B^+ \rightarrow D_{s0}^*(2317)^+ \bar{D}^0, D_{s0}^{*+} \rightarrow D_s^+ \pi^0)/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi \pi^+)]$  assuming  $B(D_s^+ \rightarrow \phi \pi^+) = 0.036 \pm 0.009$ , which we rescale to our best value  $B(D_s^+ \rightarrow \phi \pi^+) = (4.5 \pm 0.4) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(D_{s0}(2317)^+ \bar{D}^0 \times B(D_{s0}(2317)^+ \rightarrow D_s^{*+} \gamma))/\Gamma_{\text{total}}$   $\Gamma_{152}/\Gamma$

<u>VALUE (units <math>10^{-3}</math>)</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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**<0.76** 90 <sup>1</sup> KROKOVNY 03B BELL  $e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(D_{s0}(2317)^+ \bar{D}^*(2007)^0 \times B(D_{s0}(2317)^+ \rightarrow D_s^+ \pi^0))/\Gamma_{\text{total}}$   $\Gamma_{153}/\Gamma$

<u>VALUE (units <math>10^{-3}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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**$0.9 \pm 0.6^{+0.4}_{-0.3}$**  <sup>1</sup> AUBERT,B 04S BABR  $e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$$\Gamma(D_{sJ}(2457)^+\bar{D}^0)/\Gamma_{\text{total}} \qquad \Gamma_{154}/\Gamma$$

VALUE (units $10^{-3}$ )	DOCUMENT ID	TECN	COMMENT
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**3.1<sup>+1.0</sup><sub>-0.9</sub> OUR AVERAGE**

$4.3 \pm 1.6 \pm 1.3$	<sup>1</sup> AUBERT	06N	BABR $e^+e^- \rightarrow \Upsilon(4S)$
$4.6^{+1.8}_{-1.6} \pm 1.0$	<sup>2,3</sup> AUBERT,B	04S	BABR $e^+e^- \rightarrow \Upsilon(4S)$
$2.1^{+1.1}_{-0.9} \pm 0.5$	<sup>2,4</sup> KROKOVNY	03B	BELL $e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Uses a missing-mass method in the events that one of the  $B$  mesons is fully reconstructed.

<sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>3</sup> AUBERT,B 04S reports  $[\Gamma(B^+ \rightarrow D_{sJ}(2457)^+\bar{D}^0)/\Gamma_{\text{total}}] \times [B(D_{s1}(2460)^+ \rightarrow D_s^{*+}\pi^0)] = (2.2^{+0.8}_{-0.7} \pm 0.3) \times 10^{-3}$  which we divide by our best value  $B(D_{s1}(2460)^+ \rightarrow D_s^{*+}\pi^0) = (48 \pm 11) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>4</sup> KROKOVNY 03B reports  $[\Gamma(B^+ \rightarrow D_{sJ}(2457)^+\bar{D}^0)/\Gamma_{\text{total}}] \times [B(D_{s1}(2460)^+ \rightarrow D_s^{*+}\pi^0)] = (1.0^{+0.5}_{-0.4} \pm 0.1) \times 10^{-3}$  which we divide by our best value  $B(D_{s1}(2460)^+ \rightarrow D_s^{*+}\pi^0) = (48 \pm 11) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

$$\Gamma(D_{sJ}(2457)^+\bar{D}^0 \times B(D_{sJ}(2457)^+ \rightarrow D_s^+\gamma))/\Gamma_{\text{total}} \qquad \Gamma_{155}/\Gamma$$

VALUE (units $10^{-3}$ )	DOCUMENT ID	TECN	COMMENT
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**0.46<sup>+0.13</sup><sub>-0.11</sub> OUR AVERAGE**

$0.48^{+0.19}_{-0.13} \pm 0.04$	<sup>1,2</sup> AUBERT,B	04S	BABR $e^+e^- \rightarrow \Upsilon(4S)$
$0.45^{+0.15}_{-0.14} \pm 0.04$	<sup>1,3</sup> KROKOVNY	03B	BELL $e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> AUBERT,B 04S reports  $(0.6 \pm 0.2^{+0.2}_{-0.1}) \times 10^{-3}$  from a measurement of  $[\Gamma(B^+ \rightarrow D_{sJ}(2457)^+\bar{D}^0 \times B(D_{sJ}(2457)^+ \rightarrow D_s^+\gamma))/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi\pi^+)]$  assuming  $B(D_s^+ \rightarrow \phi\pi^+) = 0.036 \pm 0.009$ , which we rescale to our best value  $B(D_s^+ \rightarrow \phi\pi^+) = (4.5 \pm 0.4) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>3</sup> KROKOVNY 03B reports  $(0.56^{+0.16}_{-0.15} \pm 0.17) \times 10^{-3}$  from a measurement of  $[\Gamma(B^+ \rightarrow D_{sJ}(2457)^+\bar{D}^0 \times B(D_{sJ}(2457)^+ \rightarrow D_s^+\gamma))/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi\pi^+)]$  assuming  $B(D_s^+ \rightarrow \phi\pi^+) = 0.036 \pm 0.009$ , which we rescale to our best value  $B(D_s^+ \rightarrow \phi\pi^+) = (4.5 \pm 0.4) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

$$\Gamma(D_{sJ}(2457)^+\bar{D}^0 \times B(D_{sJ}(2457)^+ \rightarrow D_s^+\pi^+\pi^-))/\Gamma_{\text{total}} \qquad \Gamma_{156}/\Gamma$$

VALUE (units $10^{-3}$ )	CL%	DOCUMENT ID	TECN	COMMENT
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<b>&lt;0.22</b>	90	<sup>1</sup> KROKOVNY	03B	BELL $e^+e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(D_{sJ}(2457)^+ \bar{D}^0 \times B(D_{sJ}(2457)^+ \rightarrow D_s^+ \pi^0))/\Gamma_{\text{total}}$   $\Gamma_{157}/\Gamma$

VALUE (units $10^{-3}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;0.27</b>	90	<sup>1</sup> KROKOVNY	03B	BELL $e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(D_{sJ}(2457)^+ \bar{D}^0 \times B(D_{sJ}(2457)^+ \rightarrow D_s^{*+} \gamma))/\Gamma_{\text{total}}$   $\Gamma_{158}/\Gamma$

VALUE (units $10^{-3}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;0.98</b>	90	<sup>1</sup> KROKOVNY	03B	BELL $e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(D_{sJ}(2457)^+ \bar{D}^*(2007)^0)/\Gamma_{\text{total}}$   $\Gamma_{159}/\Gamma$

VALUE (units $10^{-3}$ )	DOCUMENT ID	TECN	COMMENT
<b>12.0 ± 3.0 OUR AVERAGE</b>			
11.2 ± 2.6 ± 2.0	<sup>1</sup> AUBERT	06N	BABR $e^+ e^- \rightarrow \Upsilon(4S)$
16 $^{+8}_{-6}$ ± 4	<sup>2,3</sup> AUBERT,B	04s	BABR $e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Uses a missing-mass method in the events that one of the  $B$  mesons is fully reconstructed.

<sup>2</sup> AUBERT,B 04s reports  $[\Gamma(B^+ \rightarrow D_{sJ}(2457)^+ \bar{D}^*(2007)^0)/\Gamma_{\text{total}}] \times [B(D_{s1}(2460)^+ \rightarrow D_s^{*+} \pi^0)] = (7.6 \pm 1.7^{+3.2}_{-2.4}) \times 10^{-3}$  which we divide by our best value  $B(D_{s1}(2460)^+ \rightarrow D_s^{*+} \pi^0) = (48 \pm 11) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>3</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(D_{sJ}(2457)^+ \bar{D}^*(2007)^0 \times B(D_{sJ}(2457)^+ \rightarrow D_s^+ \gamma))/\Gamma_{\text{total}}$   $\Gamma_{160}/\Gamma$

VALUE (units $10^{-3}$ )	DOCUMENT ID	TECN	COMMENT
<b>1.4 ± 0.4 <math>^{+0.6}_{-0.4}</math></b>	<sup>1</sup> AUBERT,B	04s	BABR $e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\bar{D}^0 D_{s1}(2536)^+ \times B(D_{s1}(2536)^+ \rightarrow D^*(2007)^0 K^+))/\Gamma_{\text{total}}$   $\Gamma_{162}/\Gamma$

VALUE (units $10^{-4}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>2.16 ± 0.52 ± 0.45</b>		<sup>1</sup> AUBERT	08B	BABR $e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

<2	90	AUBERT	03X	BABR Repl. by AUBERT 08B
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\bar{D}^0 D_{s1}(2536)^+ \times B(D_{s1}(2536)^+ \rightarrow D^*(2007)^0 K^+ + D^*(2010)^+ K^0))/\Gamma_{\text{total}}$   $\Gamma_{161}/\Gamma$

VALUE (units $10^{-4}$ )	DOCUMENT ID	TECN	COMMENT
<b>3.97 ± 0.85 ± 0.56</b>	<sup>1,2</sup> AUSHEV	11	BELL $e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Uses  $\Gamma(D^*(2007)^0 \rightarrow D^0 \pi^0) / \Gamma(D^*(2007)^0 \rightarrow D^0 \gamma) = 1.74 \pm 0.13$  and  $\Gamma(D_{s1}(2536)^+ \rightarrow D^*(2007)^0 K^+) / \Gamma(D_{s1}(2536)^+ \rightarrow D^*(2010)^+ K^0) = 1.36 \pm 0.2$ .

<sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .



$\Gamma(\bar{D}^*(2007)^0 D_{s1}(2536)^+ \times B(D_{s1}(2536)^+ \rightarrow D^*(2007)^0 K^+))/\Gamma_{\text{total}}$   $\Gamma_{163}/\Gamma$

VALUE (units $10^{-4}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>5.46 ± 1.17 ± 1.04</b>		<sup>1</sup> AUBERT	08B	BABR $e^+ e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<7	90	AUBERT	03X	BABR Repl. by AUBERT 08B
<sup>1</sup> Assumes equal production of $B^+$ and $B^0$ at the $\Upsilon(4S)$ .				

$\Gamma(\bar{D}^0 D_{s1}(2536)^+ \times B(D_{s1}(2536)^+ \rightarrow D^{*+} K^0))/\Gamma_{\text{total}}$   $\Gamma_{164}/\Gamma$

VALUE (units $10^{-4}$ )	DOCUMENT ID	TECN	COMMENT
<b>2.30 ± 0.98 ± 0.43</b>	<sup>1</sup> AUBERT	08B	BABR $e^+ e^- \rightarrow \Upsilon(4S)$
<sup>1</sup> Assumes equal production of $B^+$ and $B^0$ at the $\Upsilon(4S)$ .			

$\Gamma(\bar{D}^0 D_{sJ}(2700)^+ \times B(D_{sJ}(2700)^+ \rightarrow D^0 K^+))/\Gamma_{\text{total}}$   $\Gamma_{165}/\Gamma$

VALUE (units $10^{-4}$ )	DOCUMENT ID	TECN	COMMENT
<b>5.6 ± 1.8 OUR AVERAGE</b>	Error includes scale factor of 1.7.		
5.02 ± 0.71 ± 0.93	<sup>1</sup> LEES	15C	BABR $e^+ e^- \rightarrow \Upsilon(4S)$
11.3 ± 2.2 <sup>+1.4</sup> <sub>-2.8</sub>	<sup>1</sup> BRODZICKA	08	BELL $e^+ e^- \rightarrow \Upsilon(4S)$
<sup>1</sup> Assumes equal production of $B^+$ and $B^0$ at the $\Upsilon(4S)$ .			

$\Gamma(\bar{D}^{*0} D_{s1}(2536)^+, D_{s1}^+ \rightarrow D^{*+} K^0)/\Gamma_{\text{total}}$   $\Gamma_{166}/\Gamma$

VALUE (units $10^{-4}$ )	DOCUMENT ID	TECN	COMMENT
<b>3.92 ± 2.46 ± 0.83</b>	<sup>1</sup> AUBERT	08B	BABR $e^+ e^- \rightarrow \Upsilon(4S)$
<sup>1</sup> Assumes equal production of $B^+$ and $B^0$ at the $\Upsilon(4S)$ .			

$\Gamma(\bar{D}^0 D_{sJ}(2573)^+, D_{sJ}^+ \rightarrow D^0 K^+)/\Gamma_{\text{total}}$   $\Gamma_{167}/\Gamma$

VALUE (units $10^{-4}$ )	DOCUMENT ID	TECN	COMMENT
<b>0.08 ± 0.14 ± 0.05</b>	<sup>1</sup> LEES	15C	BABR $e^+ e^- \rightarrow \Upsilon(4S)$
<sup>1</sup> Assumes equal production of $B^+$ and $B^0$ at the $\Upsilon(4S)$ .			

$\Gamma(\bar{D}^{*0} D_{sJ}(2573), D_{sJ}^+ \rightarrow D^0 K^+)/\Gamma_{\text{total}}$   $\Gamma_{168}/\Gamma$

VALUE (units $10^{-4}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<2	90	AUBERT	03X	BABR $e^+ e^- \rightarrow \Upsilon(4S)$

$\Gamma(\bar{D}^*(2007)^0 D_{sJ}(2573), D_{sJ}^+ \rightarrow D^0 K^+)/\Gamma_{\text{total}}$   $\Gamma_{169}/\Gamma$

VALUE (units $10^{-4}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<5	90	AUBERT	03X	BABR $e^+ e^- \rightarrow \Upsilon(4S)$

$\Gamma(\bar{D}^0 D_s^{*+})/\Gamma_{\text{total}}$   $\Gamma_{170}/\Gamma$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.0076 ± 0.0016 OUR AVERAGE</b>			
0.0079 ± 0.0017 ± 0.0007	<sup>1</sup> AUBERT	06N	BABR $e^+ e^- \rightarrow \Upsilon(4S)$
0.0068 ± 0.0025 ± 0.0006	<sup>2</sup> GIBAUT	96	CLE2 $e^+ e^- \rightarrow \Upsilon(4S)$
0.010 ± 0.007 ± 0.001	<sup>3</sup> ALBRECHT	92G	ARG $e^+ e^- \rightarrow \Upsilon(4S)$

- <sup>1</sup> AUBERT 06N reports  $(0.77 \pm 0.15 \pm 0.13) \times 10^{-2}$  from a measurement of  $[\Gamma(B^+ \rightarrow \bar{D}^0 D_s^{*+})/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi\pi^+)]$  assuming  $B(D_s^+ \rightarrow \phi\pi^+) = 0.0462 \pm 0.0062$ , which we rescale to our best value  $B(D_s^+ \rightarrow \phi\pi^+) = (4.5 \pm 0.4) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.
- <sup>2</sup> GIBAUT 96 reports  $0.0087 \pm 0.0027 \pm 0.0017$  from a measurement of  $[\Gamma(B^+ \rightarrow \bar{D}^0 D_s^{*+})/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi\pi^+)]$  assuming  $B(D_s^+ \rightarrow \phi\pi^+) = 0.035$ , which we rescale to our best value  $B(D_s^+ \rightarrow \phi\pi^+) = (4.5 \pm 0.4) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.
- <sup>3</sup> ALBRECHT 92G reports  $0.016 \pm 0.012 \pm 0.003$  from a measurement of  $[\Gamma(B^+ \rightarrow \bar{D}^0 D_s^{*+})/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi\pi^+)]$  assuming  $B(D_s^+ \rightarrow \phi\pi^+) = 0.027$ , which we rescale to our best value  $B(D_s^+ \rightarrow \phi\pi^+) = (4.5 \pm 0.4) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes PDG 1990  $D^0$  branching ratios, e.g.,  $B(D^0 \rightarrow K^- \pi^+) = 3.71 \pm 0.25\%$ .

$\Gamma(\bar{D}^*(2007)^0 D_s^+)/\Gamma_{\text{total}}$   $\Gamma_{171}/\Gamma$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.0082 ± 0.0017 OUR AVERAGE</b>			
0.0078 ± 0.0018 ± 0.0007	1 AUBERT	06N BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
0.011 ± 0.004 ± 0.001	2 GIBAUT	96 CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$
0.008 ± 0.006 ± 0.001	3 ALBRECHT	92G ARG	$e^+ e^- \rightarrow \Upsilon(4S)$

- <sup>1</sup> AUBERT 06N reports  $(0.76 \pm 0.15 \pm 0.13) \times 10^{-2}$  from a measurement of  $[\Gamma(B^+ \rightarrow \bar{D}^*(2007)^0 D_s^+)/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi\pi^+)]$  assuming  $B(D_s^+ \rightarrow \phi\pi^+) = 0.0462 \pm 0.0062$ , which we rescale to our best value  $B(D_s^+ \rightarrow \phi\pi^+) = (4.5 \pm 0.4) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.
- <sup>2</sup> GIBAUT 96 reports  $0.0140 \pm 0.0043 \pm 0.0035$  from a measurement of  $[\Gamma(B^+ \rightarrow \bar{D}^*(2007)^0 D_s^+)/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi\pi^+)]$  assuming  $B(D_s^+ \rightarrow \phi\pi^+) = 0.035$ , which we rescale to our best value  $B(D_s^+ \rightarrow \phi\pi^+) = (4.5 \pm 0.4) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.
- <sup>3</sup> ALBRECHT 92G reports  $0.013 \pm 0.009 \pm 0.002$  from a measurement of  $[\Gamma(B^+ \rightarrow \bar{D}^*(2007)^0 D_s^+)/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi\pi^+)]$  assuming  $B(D_s^+ \rightarrow \phi\pi^+) = 0.027$ , which we rescale to our best value  $B(D_s^+ \rightarrow \phi\pi^+) = (4.5 \pm 0.4) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes PDG 1990  $D^0$  and  $D^*(2007)^0$  branching ratios, e.g.,  $B(D^0 \rightarrow K^- \pi^+) = 3.71 \pm 0.25\%$  and  $B(D^*(2007)^0 \rightarrow D^0 \pi^0) = 55 \pm 6\%$ .

$\Gamma(\bar{D}^*(2007)^0 D_s^{*+})/\Gamma_{\text{total}}$   $\Gamma_{172}/\Gamma$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.0171 ± 0.0024 OUR AVERAGE</b>			
0.0167 ± 0.0019 ± 0.0015	1 AUBERT	06N BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
0.024 ± 0.009 ± 0.002	2 GIBAUT	96 CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$
0.019 ± 0.010 ± 0.002	3 ALBRECHT	92G ARG	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> AUBERT 06N reports  $(1.62 \pm 0.22 \pm 0.18) \times 10^{-2}$  from a measurement of  $[\Gamma(B^+ \rightarrow \bar{D}^*(2007)^0 D_s^{*+})/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi\pi^+)]$  assuming  $B(D_s^+ \rightarrow \phi\pi^+) = 0.0462 \pm 0.0062$ , which we rescale to our best value  $B(D_s^+ \rightarrow \phi\pi^+) = (4.5 \pm 0.4) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>2</sup> GIBAUT 96 reports  $0.0310 \pm 0.0088 \pm 0.0065$  from a measurement of  $[\Gamma(B^+ \rightarrow \bar{D}^*(2007)^0 D_s^{*+})/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi\pi^+)]$  assuming  $B(D_s^+ \rightarrow \phi\pi^+) = 0.035$ , which we rescale to our best value  $B(D_s^+ \rightarrow \phi\pi^+) = (4.5 \pm 0.4) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>3</sup> ALBRECHT 92G reports  $0.031 \pm 0.016 \pm 0.005$  from a measurement of  $[\Gamma(B^+ \rightarrow \bar{D}^*(2007)^0 D_s^{*+})/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi\pi^+)]$  assuming  $B(D_s^+ \rightarrow \phi\pi^+) = 0.027$ , which we rescale to our best value  $B(D_s^+ \rightarrow \phi\pi^+) = (4.5 \pm 0.4) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes PDG 1990  $D^0$  and  $D^*(2007)^0$  branching ratios, e.g.,  $B(D^0 \rightarrow K^- \pi^+) = 3.71 \pm 0.25\%$  and  $B(D^*(2007)^0 \rightarrow D^0 \pi^0) = 55 \pm 6\%$ .

$\Gamma(D_s^{(*)+} \bar{D}^{**0})/\Gamma_{\text{total}} \qquad \Gamma_{173}/\Gamma$

VALUE	DOCUMENT ID	TECN	COMMENT
$(2.73 \pm 0.93 \pm 0.68) \times 10^{-2}$	<sup>1</sup> AHMED	00B CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> AHMED 00B reports their experiment's uncertainties  $(\pm 0.78 \pm 0.48 \pm 0.68)\%$ , where the first error is statistical, the second is systematic, and the third is the uncertainty in the  $D_s \rightarrow \phi\pi$  branching fraction. We combine the first two in quadrature.

$\Gamma(\bar{D}^*(2007)^0 D^*(2010)^+)/\Gamma_{\text{total}} \qquad \Gamma_{174}/\Gamma$

VALUE (units $10^{-4}$ )	CL%	DOCUMENT ID	TECN	COMMENT
$8.1 \pm 1.2 \pm 1.2$		<sup>1</sup> AUBERT,B	06A BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

<110	90	BARATE	98Q ALEP	$e^+ e^- \rightarrow Z$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$[\Gamma(\bar{D}^0 D^*(2010)^+) + \Gamma(\bar{D}^*(2007)^0 D^+)]/\Gamma_{\text{total}} \qquad \Gamma_{175}/\Gamma$

VALUE (units $10^{-4}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<130	90	BARATE	98Q ALEP	$e^+ e^- \rightarrow Z$

$\Gamma(\bar{D}^0 D^*(2010)^+)/\Gamma_{\text{total}} \qquad \Gamma_{176}/\Gamma$

VALUE (units $10^{-4}$ )	DOCUMENT ID	TECN	COMMENT
<b>3.9 ± 0.5 OUR AVERAGE</b>			
3.6 ± 0.5 ± 0.4	<sup>1</sup> AUBERT,B	06A BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
4.57 ± 0.71 ± 0.56	<sup>1</sup> MAJUMDER	05 BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\bar{D}^0 D^+)/\Gamma_{\text{total}} \qquad \Gamma_{177}/\Gamma$

VALUE (units $10^{-4}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>3.8 ± 0.4 OUR AVERAGE</b>				
3.85 ± 0.31 ± 0.38		<sup>1</sup> ADACHI	08 BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
3.8 ± 0.6 ± 0.5		<sup>1</sup> AUBERT,B	06A BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

4.83±0.78±0.58                    <sup>1</sup> MAJUMDER 05 BELL Repl. by ADACHI 08  
 <67                    90                    BARATE 98Q ALEP e<sup>+</sup>e<sup>-</sup> → Z  
<sup>1</sup> Assumes equal production of B<sup>+</sup> and B<sup>0</sup> at the  $\Upsilon(4S)$ .

$\Gamma(\bar{D}^0 D^+ K^0)/\Gamma_{\text{total}}$   $\Gamma_{178}/\Gamma$

VALUE (units 10 <sup>-3</sup> )	CL%	DOCUMENT ID	TECN	COMMENT
<b>1.55±0.17±0.13</b>		<sup>1</sup> DEL-AMO-SA..11B	BABR	e <sup>+</sup> e <sup>-</sup> → $\Upsilon(4S)$
• • •		We do not use the following data for averages, fits, limits, etc. • • •		
<2.8	90	<sup>1</sup> AUBERT 03X	BABR	Repl. by DEL-AMO-SANCHEZ 11B
<sup>1</sup> Assumes equal production of B <sup>+</sup> and B <sup>0</sup> at the $\Upsilon(4S)$ .				

$\Gamma(D^+ \bar{D}^*(2007)^0)/\Gamma_{\text{total}}$   $\Gamma_{179}/\Gamma$

VALUE (units 10 <sup>-4</sup> )	DOCUMENT ID	TECN	COMMENT
<b>6.3±1.4±1.0</b>	<sup>1</sup> AUBERT,B 06A	BABR	e <sup>+</sup> e <sup>-</sup> → $\Upsilon(4S)$
<sup>1</sup> Assumes equal production of B <sup>+</sup> and B <sup>0</sup> at the $\Upsilon(4S)$ .			

$\Gamma(\bar{D}^*(2007)^0 D^+ K^0)/\Gamma_{\text{total}}$   $\Gamma_{180}/\Gamma$

VALUE (units 10 <sup>-3</sup> )	CL%	DOCUMENT ID	TECN	COMMENT
<b>2.06±0.38±0.30</b>		<sup>1</sup> DEL-AMO-SA..11B	BABR	e <sup>+</sup> e <sup>-</sup> → $\Upsilon(4S)$
• • •		We do not use the following data for averages, fits, limits, etc. • • •		
<6.1	90	<sup>1</sup> AUBERT 03X	BABR	Repl. by DEL-AMO-SANCHEZ 11B
<sup>1</sup> Assumes equal production of B <sup>+</sup> and B <sup>0</sup> at the $\Upsilon(4S)$ .				

$\Gamma(\bar{D}^0 D^*(2010)^+ K^0)/\Gamma_{\text{total}}$   $\Gamma_{181}/\Gamma$

VALUE (units 10 <sup>-3</sup> )	DOCUMENT ID	TECN	COMMENT
<b>3.81±0.31±0.23</b>	<sup>1</sup> DEL-AMO-SA..11B	BABR	e <sup>+</sup> e <sup>-</sup> → $\Upsilon(4S)$
• • •	We do not use the following data for averages, fits, limits, etc. • • •		
5.2 <sup>+1.0</sup> / <sub>-0.9</sub> ±0.7	<sup>1</sup> AUBERT 03X	BABR	Repl. by DEL-AMO-SANCHEZ 11B
<sup>1</sup> Assumes equal production of B <sup>+</sup> and B <sup>0</sup> at the $\Upsilon(4S)$ .			

$\Gamma(\bar{D}^*(2007)^0 D^*(2010)^+ K^0)/\Gamma_{\text{total}}$   $\Gamma_{182}/\Gamma$

VALUE (units 10 <sup>-3</sup> )	DOCUMENT ID	TECN	COMMENT
<b>9.17±0.83±0.90</b>	<sup>1</sup> DEL-AMO-SA..11B	BABR	e <sup>+</sup> e <sup>-</sup> → $\Upsilon(4S)$
• • •	We do not use the following data for averages, fits, limits, etc. • • •		
7.8 <sup>+2.3</sup> / <sub>-2.1</sub> ±1.4	<sup>1</sup> AUBERT 03X	BABR	Repl. by DEL-AMO-SANCHEZ 11B
<sup>1</sup> Assumes equal production of B <sup>+</sup> and B <sup>0</sup> at the $\Upsilon(4S)$ .			

$\Gamma(\bar{D}^0 D^0 K^+)/\Gamma_{\text{total}}$   $\Gamma_{183}/\Gamma$

VALUE (units 10 <sup>-3</sup> )	DOCUMENT ID	TECN	COMMENT
<b>1.45±0.33 OUR AVERAGE</b>	Error includes scale factor of 2.6.		
1.31±0.07±0.12	<sup>1</sup> DEL-AMO-SA..11B	BABR	e <sup>+</sup> e <sup>-</sup> → $\Upsilon(4S)$
2.22±0.22 <sup>+0.26</sup> / <sub>-0.24</sub>	<sup>1</sup> BRODZICKA 08	BELL	e <sup>+</sup> e <sup>-</sup> → $\Upsilon(4S)$
• • •	We do not use the following data for averages, fits, limits, etc. • • •		

1.17±0.21±0.15      <sup>1</sup> CHISTOV      04      BELL      Repl. by BRODZICKA 08  
 1.9 ±0.3 ±0.3      <sup>1</sup> AUBERT      03X      BABR      Repl. by DEL-AMO-SANCHEZ 11B

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\bar{D}^*(2007)^0 D^0 K^+)/\Gamma_{\text{total}}$   $\Gamma_{184}/\Gamma$

VALUE (units $10^{-3}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>2.26±0.16±0.17</b>		<sup>1</sup> DEL-AMO-SA..11B	BABR	$e^+e^- \rightarrow \Upsilon(4S)$

••• We do not use the following data for averages, fits, limits, etc. •••

<3.8	90	<sup>1</sup> AUBERT	03X      BABR	Repl. by DEL-AMO-SANCHEZ 11B
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\bar{D}^0 D^*(2007)^0 K^+)/\Gamma_{\text{total}}$   $\Gamma_{185}/\Gamma$

VALUE (units $10^{-3}$ )	DOCUMENT ID	TECN	COMMENT
<b>6.32±0.19±0.45</b>	<sup>1</sup> DEL-AMO-SA..11B	BABR	$e^+e^- \rightarrow \Upsilon(4S)$

••• We do not use the following data for averages, fits, limits, etc. •••

4.7 ±0.7 ±0.7	<sup>1</sup> AUBERT	03X      BABR	Repl. by DEL-AMO-SANCHEZ 11B
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\bar{D}^*(2007)^0 D^*(2007)^0 K^+)/\Gamma_{\text{total}}$   $\Gamma_{186}/\Gamma$

VALUE (units $10^{-3}$ )	DOCUMENT ID	TECN	COMMENT
<b>11.23±0.36±1.26</b>	<sup>1</sup> DEL-AMO-SA..11B	BABR	$e^+e^- \rightarrow \Upsilon(4S)$

••• We do not use the following data for averages, fits, limits, etc. •••

5.3 <sup>+1.1</sup> <sub>-1.0</sub> ±1.2	<sup>1</sup> AUBERT	03X      BABR	Repl. by DEL-AMO-SANCHEZ 11B
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(D^- D^+ K^+)/\Gamma_{\text{total}}$   $\Gamma_{187}/\Gamma$

VALUE (units $10^{-3}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>0.22±0.05±0.05</b>		<sup>1</sup> DEL-AMO-SA..11B	BABR	$e^+e^- \rightarrow \Upsilon(4S)$

••• We do not use the following data for averages, fits, limits, etc. •••

<0.90	90	<sup>1</sup> CHISTOV	04      BELL	$e^+e^- \rightarrow \Upsilon(4S)$
<0.4	90	<sup>1</sup> AUBERT	03X      BABR	Repl. by DEL-AMO-SANCHEZ 11B

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(D^- D^*(2010)^+ K^+)/\Gamma_{\text{total}}$   $\Gamma_{188}/\Gamma$

VALUE (units $10^{-3}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>0.63±0.09±0.06</b>		<sup>1</sup> DEL-AMO-SA..11B	BABR	$e^+e^- \rightarrow \Upsilon(4S)$

••• We do not use the following data for averages, fits, limits, etc. •••

<0.7	90	<sup>1</sup> AUBERT	03X      BABR	Repl. by DEL-AMO-SANCHEZ 11B
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(D^*(2010)^- D^+ K^+)/\Gamma_{\text{total}}$   $\Gamma_{189}/\Gamma$

VALUE (units $10^{-3}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>0.60 ± 0.10 ± 0.08</b>		<sup>1</sup> DEL-AMO-SA...11B	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1.5 ± 0.3 ± 0.2		<sup>1</sup> AUBERT	03X BABR	Repl. by DEL-AMO-SANCHEZ 11B

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(D^*(2010)^- D^*(2010)^+ K^+)/\Gamma_{\text{total}}$   $\Gamma_{190}/\Gamma$

VALUE (units $10^{-3}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>1.32 ± 0.13 ± 0.12</b>		<sup>1</sup> DEL-AMO-SA...11B	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<1.8	90	<sup>1</sup> AUBERT	03X BABR	Repl. by DEL-AMO-SANCHEZ 11B

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma((\bar{D} + \bar{D}^*)(D + D^*)K)/\Gamma_{\text{total}}$   $\Gamma_{191}/\Gamma$

VALUE (units $10^{-2}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>4.05 ± 0.11 ± 0.28</b>		<sup>1</sup> DEL-AMO-SA...11B	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
3.5 ± 0.3 ± 0.5		<sup>1</sup> AUBERT	03X BABR	Repl. by DEL-AMO-SANCHEZ 11B

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(D_s^+ \pi^0)/\Gamma_{\text{total}}$   $\Gamma_{192}/\Gamma$

VALUE (units $10^{-5}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>1.6<sup>+0.6</sup><sub>-0.5</sub> ± 0.1</b>		<sup>1</sup> AUBERT	07M BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

<16                      90                      <sup>2</sup> ALEXANDER 93B CLE2  $e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> AUBERT 07M reports  $[\Gamma(B^+ \rightarrow D_s^+ \pi^0)/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi \pi^+)] = (7.0^{+2.4+0.6}_{-2.1-0.8}) \times 10^{-7}$  which we divide by our best value  $B(D_s^+ \rightarrow \phi \pi^+) = (4.5 \pm 0.4) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>2</sup> ALEXANDER 93B reports  $< 2.0 \times 10^{-4}$  from a measurement of  $[\Gamma(B^+ \rightarrow D_s^+ \pi^0)/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi \pi^+)]$  assuming  $B(D_s^+ \rightarrow \phi \pi^+) = 0.037$ , which we rescale to our best value  $B(D_s^+ \rightarrow \phi \pi^+) = 4.5 \times 10^{-2}$ .

$[\Gamma(D_s^+ \pi^0) + \Gamma(D_s^{*+} \pi^0)]/\Gamma_{\text{total}}$   $(\Gamma_{192} + \Gamma_{193})/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt; 5 × 10<sup>-4</sup></b>	90	<sup>1</sup> ALBRECHT 93E	ARG	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> ALBRECHT 93E reports  $< 0.9 \times 10^{-3}$  from a measurement of  $[[\Gamma(B^+ \rightarrow D_s^+ \pi^0) + \Gamma(B^+ \rightarrow D_s^{*+} \pi^0)]/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi \pi^+)]$  assuming  $B(D_s^+ \rightarrow \phi \pi^+) = 0.027$ , which we rescale to our best value  $B(D_s^+ \rightarrow \phi \pi^+) = 4.5 \times 10^{-2}$ .

$\Gamma(D_s^{*+} \pi^0)/\Gamma_{\text{total}}$					$\Gamma_{193}/\Gamma$
VALUE	CL%	DOCUMENT ID	TECN	COMMENT	
$<2.6 \times 10^{-4}$	90	<sup>1</sup> ALEXANDER 93B	CLE2	$e^+e^- \rightarrow \gamma(4S)$	

<sup>1</sup> ALEXANDER 93B reports  $< 3.2 \times 10^{-4}$  from a measurement of  $[\Gamma(B^+ \rightarrow D_s^{*+} \pi^0)/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi\pi^+)]$  assuming  $B(D_s^+ \rightarrow \phi\pi^+) = 0.037$ , which we rescale to our best value  $B(D_s^+ \rightarrow \phi\pi^+) = 4.5 \times 10^{-2}$ .

$\Gamma(D_s^+ \eta)/\Gamma_{\text{total}}$					$\Gamma_{194}/\Gamma$
VALUE	CL%	DOCUMENT ID	TECN	COMMENT	
$<4 \times 10^{-4}$	90	<sup>1</sup> ALEXANDER 93B	CLE2	$e^+e^- \rightarrow \gamma(4S)$	

<sup>1</sup> ALEXANDER 93B reports  $< 4.6 \times 10^{-4}$  from a measurement of  $[\Gamma(B^+ \rightarrow D_s^+ \eta)/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi\pi^+)]$  assuming  $B(D_s^+ \rightarrow \phi\pi^+) = 0.037$ , which we rescale to our best value  $B(D_s^+ \rightarrow \phi\pi^+) = 4.5 \times 10^{-2}$ .

$\Gamma(D_s^{*+} \eta)/\Gamma_{\text{total}}$					$\Gamma_{195}/\Gamma$
VALUE	CL%	DOCUMENT ID	TECN	COMMENT	
$<6 \times 10^{-4}$	90	<sup>1</sup> ALEXANDER 93B	CLE2	$e^+e^- \rightarrow \gamma(4S)$	

<sup>1</sup> ALEXANDER 93B reports  $< 7.5 \times 10^{-4}$  from a measurement of  $[\Gamma(B^+ \rightarrow D_s^{*+} \eta)/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi\pi^+)]$  assuming  $B(D_s^+ \rightarrow \phi\pi^+) = 0.037$ , which we rescale to our best value  $B(D_s^+ \rightarrow \phi\pi^+) = 4.5 \times 10^{-2}$ .

$\Gamma(D_s^+ \rho^0)/\Gamma_{\text{total}}$					$\Gamma_{196}/\Gamma$
VALUE	CL%	DOCUMENT ID	TECN	COMMENT	
$<3.0 \times 10^{-4}$	90	<sup>1</sup> ALEXANDER 93B	CLE2	$e^+e^- \rightarrow \gamma(4S)$	

<sup>1</sup> ALEXANDER 93B reports  $< 3.7 \times 10^{-4}$  from a measurement of  $[\Gamma(B^+ \rightarrow D_s^+ \rho^0)/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi\pi^+)]$  assuming  $B(D_s^+ \rightarrow \phi\pi^+) = 0.037$ , which we rescale to our best value  $B(D_s^+ \rightarrow \phi\pi^+) = 4.5 \times 10^{-2}$ .

$[\Gamma(D_s^+ \rho^0) + \Gamma(D_s^+ \bar{K}^*(892)^0)]/\Gamma_{\text{total}}$					$(\Gamma_{196} + \Gamma_{206})/\Gamma$
VALUE	CL%	DOCUMENT ID	TECN	COMMENT	
$<2.0 \times 10^{-3}$	90	<sup>1</sup> ALBRECHT 93E	ARG	$e^+e^- \rightarrow \gamma(4S)$	

<sup>1</sup> ALBRECHT 93E reports  $< 3.4 \times 10^{-3}$  from a measurement of  $[[\Gamma(B^+ \rightarrow D_s^+ \rho^0) + \Gamma(B^+ \rightarrow D_s^+ \bar{K}^*(892)^0)]/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi\pi^+)]$  assuming  $B(D_s^+ \rightarrow \phi\pi^+) = 0.027$ , which we rescale to our best value  $B(D_s^+ \rightarrow \phi\pi^+) = 4.5 \times 10^{-2}$ .

$\Gamma(D_s^{*+} \rho^0)/\Gamma_{\text{total}}$					$\Gamma_{197}/\Gamma$
VALUE	CL%	DOCUMENT ID	TECN	COMMENT	
$<4 \times 10^{-4}$	90	<sup>1</sup> ALEXANDER 93B	CLE2	$e^+e^- \rightarrow \gamma(4S)$	

<sup>1</sup> ALEXANDER 93B reports  $< 4.8 \times 10^{-4}$  from a measurement of  $[\Gamma(B^+ \rightarrow D_s^{*+} \rho^0)/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi\pi^+)]$  assuming  $B(D_s^+ \rightarrow \phi\pi^+) = 0.037$ , which we rescale to our best value  $B(D_s^+ \rightarrow \phi\pi^+) = 4.5 \times 10^{-2}$ .

$$\frac{[\Gamma(D_s^{*+} \rho^0) + \Gamma(D_s^{*+} \bar{K}^*(892)^0)]/\Gamma_{\text{total}}}{\Gamma_{197} + \Gamma_{208}}/\Gamma$$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<1.2 \times 10^{-3}$	90	<sup>1</sup> ALBRECHT 93E	ARG	$e^+ e^- \rightarrow \gamma(4S)$

<sup>1</sup> ALBRECHT 93E reports  $< 2.0 \times 10^{-3}$  from a measurement of  $[\Gamma(B^+ \rightarrow D_s^{*+} \rho^0) + \Gamma(B^+ \rightarrow D_s^{*+} \bar{K}^*(892)^0)]/\Gamma_{\text{total}} \times [B(D_s^+ \rightarrow \phi\pi^+)]$  assuming  $B(D_s^+ \rightarrow \phi\pi^+) = 0.027$ , which we rescale to our best value  $B(D_s^+ \rightarrow \phi\pi^+) = 4.5 \times 10^{-2}$ .

$$\frac{\Gamma(D_s^+ \omega)/\Gamma_{\text{total}}}{\Gamma_{198}}/\Gamma$$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<4 \times 10^{-4}$	90	<sup>1</sup> ALEXANDER 93B	CLE2	$e^+ e^- \rightarrow \gamma(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$<2.0 \times 10^{-3}$	90	<sup>2</sup> ALBRECHT 93E	ARG	$e^+ e^- \rightarrow \gamma(4S)$
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<sup>1</sup> ALEXANDER 93B reports  $< 4.8 \times 10^{-4}$  from a measurement of  $[\Gamma(B^+ \rightarrow D_s^+ \omega)/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi\pi^+)]$  assuming  $B(D_s^+ \rightarrow \phi\pi^+) = 0.037$ , which we rescale to our best value  $B(D_s^+ \rightarrow \phi\pi^+) = 4.5 \times 10^{-2}$ .

<sup>2</sup> ALBRECHT 93E reports  $< 3.4 \times 10^{-3}$  from a measurement of  $[\Gamma(B^+ \rightarrow D_s^+ \omega)/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi\pi^+)]$  assuming  $B(D_s^+ \rightarrow \phi\pi^+) = 0.027$ , which we rescale to our best value  $B(D_s^+ \rightarrow \phi\pi^+) = 4.5 \times 10^{-2}$ .

$$\frac{\Gamma(D_s^{*+} \omega)/\Gamma_{\text{total}}}{\Gamma_{199}}/\Gamma$$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<6 \times 10^{-4}$	90	<sup>1</sup> ALEXANDER 93B	CLE2	$e^+ e^- \rightarrow \gamma(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$<1.1 \times 10^{-3}$	90	<sup>2</sup> ALBRECHT 93E	ARG	$e^+ e^- \rightarrow \gamma(4S)$
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<sup>1</sup> ALEXANDER 93B reports  $< 6.8 \times 10^{-4}$  from a measurement of  $[\Gamma(B^+ \rightarrow D_s^{*+} \omega)/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi\pi^+)]$  assuming  $B(D_s^+ \rightarrow \phi\pi^+) = 0.037$ , which we rescale to our best value  $B(D_s^+ \rightarrow \phi\pi^+) = 4.5 \times 10^{-2}$ .

<sup>2</sup> ALBRECHT 93E reports  $< 1.9 \times 10^{-3}$  from a measurement of  $[\Gamma(B^+ \rightarrow D_s^{*+} \omega)/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi\pi^+)]$  assuming  $B(D_s^+ \rightarrow \phi\pi^+) = 0.027$ , which we rescale to our best value  $B(D_s^+ \rightarrow \phi\pi^+) = 4.5 \times 10^{-2}$ .

$$\frac{\Gamma(D_s^+ a_1(1260)^0)/\Gamma_{\text{total}}}{\Gamma_{200}}/\Gamma$$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<1.8 \times 10^{-3}$	90	<sup>1</sup> ALBRECHT 93E	ARG	$e^+ e^- \rightarrow \gamma(4S)$

<sup>1</sup> ALBRECHT 93E reports  $< 3.0 \times 10^{-3}$  from a measurement of  $[\Gamma(B^+ \rightarrow D_s^+ a_1(1260)^0)/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi\pi^+)]$  assuming  $B(D_s^+ \rightarrow \phi\pi^+) = 0.027$ , which we rescale to our best value  $B(D_s^+ \rightarrow \phi\pi^+) = 4.5 \times 10^{-2}$ .

$$\frac{\Gamma(D_s^{*+} a_1(1260)^0)/\Gamma_{\text{total}}}{\Gamma_{201}}/\Gamma$$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<1.3 \times 10^{-3}$	90	<sup>1</sup> ALBRECHT 93E	ARG	$e^+ e^- \rightarrow \gamma(4S)$



<sup>1</sup>ALBRECHT 93E reports  $< 2.2 \times 10^{-3}$  from a measurement of  $[\Gamma(B^+ \rightarrow D_s^{*+} a_1(1260)^0)/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi\pi^+)]$  assuming  $B(D_s^+ \rightarrow \phi\pi^+) = 0.027$ , which we rescale to our best value  $B(D_s^+ \rightarrow \phi\pi^+) = 4.5 \times 10^{-2}$ .

$\Gamma(D_s^+ \phi)/\Gamma_{\text{total}}$   $\Gamma_{202}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b><math>1.7^{+1.1}_{-0.7} \pm 0.2</math></b>		<sup>1</sup> AAIJ	13R	LHCB $pp$ at 7 TeV

• • • We do not use the following data for averages, fits, limits, etc. • • •

$< 1.9$	90	<sup>2</sup> AUBERT	06F	BABR $e^+e^- \rightarrow \Upsilon(4S)$
$< 1000$	90	<sup>3</sup> ALBRECHT	93E	ARG $e^+e^- \rightarrow \Upsilon(4S)$
$< 260$	90	<sup>4</sup> ALEXANDER	93B	CLE2 $e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup>AAIJ 13R reports  $(1.87^{+1.25}_{-0.73} \pm 0.19 \pm 0.32) \times 10^{-6}$  from a measurement of  $[\Gamma(B^+ \rightarrow D_s^+ \phi)/\Gamma_{\text{total}}] / [B(B^+ \rightarrow \bar{D}^0 D_s^+)]$  assuming  $B(B^+ \rightarrow \bar{D}^0 D_s^+) = (10.0 \pm 1.7) \times 10^{-3}$ , which we rescale to our best value  $B(B^+ \rightarrow \bar{D}^0 D_s^+) = (9.0 \pm 0.9) \times 10^{-3}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>2</sup>Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>3</sup>ALBRECHT 93E reports  $< 1.7 \times 10^{-3}$  from a measurement of  $[\Gamma(B^+ \rightarrow D_s^+ \phi)/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi\pi^+)]$  assuming  $B(D_s^+ \rightarrow \phi\pi^+) = 0.027$ , which we rescale to our best value  $B(D_s^+ \rightarrow \phi\pi^+) = 4.5 \times 10^{-2}$ .

<sup>4</sup>ALEXANDER 93B reports  $< 3.1 \times 10^{-4}$  from a measurement of  $[\Gamma(B^+ \rightarrow D_s^+ \phi)/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi\pi^+)]$  assuming  $B(D_s^+ \rightarrow \phi\pi^+) = 0.037$ , which we rescale to our best value  $B(D_s^+ \rightarrow \phi\pi^+) = 4.5 \times 10^{-2}$ .

$\Gamma(D_s^{*+} \phi)/\Gamma_{\text{total}}$   $\Gamma_{203}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b><math>&lt; 1.2 \times 10^{-5}</math></b>	90	<sup>1</sup> AUBERT	06F	BABR $e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$< 1.3 \times 10^{-3}$	90	<sup>2</sup> ALBRECHT	93E	ARG $e^+e^- \rightarrow \Upsilon(4S)$
$< 3.5 \times 10^{-4}$	90	<sup>3</sup> ALEXANDER	93B	CLE2 $e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup>Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup>ALBRECHT 93E reports  $< 2.1 \times 10^{-3}$  from a measurement of  $[\Gamma(B^+ \rightarrow D_s^{*+} \phi)/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi\pi^+)]$  assuming  $B(D_s^+ \rightarrow \phi\pi^+) = 0.027$ , which we rescale to our best value  $B(D_s^+ \rightarrow \phi\pi^+) = 4.5 \times 10^{-2}$ .

<sup>3</sup>ALEXANDER 93B reports  $< 4.2 \times 10^{-4}$  from a measurement of  $[\Gamma(B^+ \rightarrow D_s^{*+} \phi)/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi\pi^+)]$  assuming  $B(D_s^+ \rightarrow \phi\pi^+) = 0.037$ , which we rescale to our best value  $B(D_s^+ \rightarrow \phi\pi^+) = 4.5 \times 10^{-2}$ .

$\Gamma(D_s^+ \bar{K}^0)/\Gamma_{\text{total}}$   $\Gamma_{204}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b><math>&lt; 8 \times 10^{-4}</math></b>	90	<sup>1</sup> ALEXANDER	93B	CLE2 $e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$< 1.5 \times 10^{-3}$	90	<sup>2</sup> ALBRECHT	93E	ARG $e^+e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> ALEXANDER 93B reports  $< 10.3 \times 10^{-4}$  from a measurement of  $[\Gamma(B^+ \rightarrow D_s^+ \bar{K}^0)/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi\pi^+)]$  assuming  $B(D_s^+ \rightarrow \phi\pi^+) = 0.037$ , which we rescale to our best value  $B(D_s^+ \rightarrow \phi\pi^+) = 4.5 \times 10^{-2}$ .

<sup>2</sup> ALBRECHT 93E reports  $< 2.5 \times 10^{-3}$  from a measurement of  $[\Gamma(B^+ \rightarrow D_s^+ \bar{K}^0)/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi\pi^+)]$  assuming  $B(D_s^+ \rightarrow \phi\pi^+) = 0.027$ , which we rescale to our best value  $B(D_s^+ \rightarrow \phi\pi^+) = 4.5 \times 10^{-2}$ .

### $\Gamma(D_s^{*+} \bar{K}^0)/\Gamma_{\text{total}}$ $\Gamma_{205}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b><math>&lt; 9 \times 10^{-4}</math></b>	90	<sup>1</sup> ALEXANDER 93B	CLE2	$e^+e^- \rightarrow \gamma(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$< 1.9 \times 10^{-3}$	90	<sup>2</sup> ALBRECHT 93E	ARG	$e^+e^- \rightarrow \gamma(4S)$
<sup>1</sup> ALEXANDER 93B reports $< 10.9 \times 10^{-4}$ from a measurement of $[\Gamma(B^+ \rightarrow D_s^{*+} \bar{K}^0)/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi\pi^+)]$ assuming $B(D_s^+ \rightarrow \phi\pi^+) = 0.037$ , which we rescale to our best value $B(D_s^+ \rightarrow \phi\pi^+) = 4.5 \times 10^{-2}$ .				
<sup>2</sup> ALBRECHT 93E reports $< 3.1 \times 10^{-3}$ from a measurement of $[\Gamma(B^+ \rightarrow D_s^{*+} \bar{K}^0)/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi\pi^+)]$ assuming $B(D_s^+ \rightarrow \phi\pi^+) = 0.027$ , which we rescale to our best value $B(D_s^+ \rightarrow \phi\pi^+) = 4.5 \times 10^{-2}$ .				

### $\Gamma(D_s^+ \bar{K}^*(892)^0)/\Gamma_{\text{total}}$ $\Gamma_{206}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b><math>&lt; 4.4 \times 10^{-6}</math></b>	90	AAIJ	13R	LHCB $pp$ at 7 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$< 4 \times 10^{-4}$	90	<sup>1</sup> ALEXANDER 93B	CLE2	$e^+e^- \rightarrow \gamma(4S)$
<sup>1</sup> ALEXANDER 93B reports $< 4.4 \times 10^{-4}$ from a measurement of $[\Gamma(B^+ \rightarrow D_s^+ \bar{K}^*(892)^0)/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi\pi^+)]$ assuming $B(D_s^+ \rightarrow \phi\pi^+) = 0.037$ , which we rescale to our best value $B(D_s^+ \rightarrow \phi\pi^+) = 4.5 \times 10^{-2}$ .				

### $\Gamma(D_s^+ K^{*0})/\Gamma_{\text{total}}$ $\Gamma_{207}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b><math>&lt; 3.5</math></b>	90	AAIJ	13R	LHCB $pp$ at 7 TeV

### $\Gamma(D_s^{*+} \bar{K}^*(892)^0)/\Gamma_{\text{total}}$ $\Gamma_{208}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b><math>&lt; 3.5 \times 10^{-4}</math></b>	90	<sup>1</sup> ALEXANDER 93B	CLE2	$e^+e^- \rightarrow \gamma(4S)$
<sup>1</sup> ALEXANDER 93B reports $< 4.3 \times 10^{-4}$ from a measurement of $[\Gamma(B^+ \rightarrow D_s^{*+} \bar{K}^*(892)^0)/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi\pi^+)]$ assuming $B(D_s^+ \rightarrow \phi\pi^+) = 0.037$ , which we rescale to our best value $B(D_s^+ \rightarrow \phi\pi^+) = 4.5 \times 10^{-2}$ .				

$\Gamma(D_s^- \pi^+ K^+)/\Gamma_{\text{total}}$   $\Gamma_{209}/\Gamma$

VALUE (units $10^{-4}$ )	CL%	DOCUMENT ID	TECN	COMMENT
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**1.80 ± 0.22 OUR AVERAGE**

1.71<sup>+0.08</sup><sub>-0.07</sub> ± 0.25      <sup>1</sup> WIEHCZYN...09    BELL     $e^+e^- \rightarrow \gamma(4S)$

2.02 ± 0.13 ± 0.38      <sup>1</sup> AUBERT      08G    BABR     $e^+e^- \rightarrow \gamma(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

<7      90      <sup>2</sup> ALBRECHT    93E    ARG     $e^+e^- \rightarrow \gamma(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\gamma(4S)$ .

<sup>2</sup> ALBRECHT 93E reports  $< 1.1 \times 10^{-3}$  from a measurement of  $[\Gamma(B^+ \rightarrow D_s^- \pi^+ K^+)/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi\pi^+)]$  assuming  $B(D_s^+ \rightarrow \phi\pi^+) = 0.027$ , which we rescale to our best value  $B(D_s^+ \rightarrow \phi\pi^+) = 4.5 \times 10^{-2}$ .

$\Gamma(D_s^{*-} \pi^+ K^+)/\Gamma_{\text{total}}$   $\Gamma_{210}/\Gamma$

VALUE (units $10^{-4}$ )	CL%	DOCUMENT ID	TECN	COMMENT
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**1.45 ± 0.24 OUR AVERAGE**

1.31<sup>+0.13</sup><sub>-0.12</sub> ± 0.28      <sup>1</sup> WIEHCZYN...09    BELL     $e^+e^- \rightarrow \gamma(4S)$

1.67 ± 0.16 ± 0.35      <sup>1</sup> AUBERT      08G    BABR     $e^+e^- \rightarrow \gamma(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

<10      90      <sup>2</sup> ALBRECHT    93E    ARG     $e^+e^- \rightarrow \gamma(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\gamma(4S)$ .

<sup>2</sup> ALBRECHT 93E reports  $< 1.6 \times 10^{-3}$  from a measurement of  $[\Gamma(B^+ \rightarrow D_s^{*-} \pi^+ K^+)/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi\pi^+)]$  assuming  $B(D_s^+ \rightarrow \phi\pi^+) = 0.027$ , which we rescale to our best value  $B(D_s^+ \rightarrow \phi\pi^+) = 4.5 \times 10^{-2}$ .

$\Gamma(D_s^- \pi^+ K^*(892)^+)/\Gamma_{\text{total}}$   $\Gamma_{211}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
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**<5 × 10<sup>-3</sup>**      90      <sup>1</sup> ALBRECHT    93E    ARG     $e^+e^- \rightarrow \gamma(4S)$

<sup>1</sup> ALBRECHT 93E reports  $< 8.6 \times 10^{-3}$  from a measurement of  $[\Gamma(B^+ \rightarrow D_s^- \pi^+ K^*(892)^+)/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi\pi^+)]$  assuming  $B(D_s^+ \rightarrow \phi\pi^+) = 0.027$ , which we rescale to our best value  $B(D_s^+ \rightarrow \phi\pi^+) = 4.5 \times 10^{-2}$ .

$\Gamma(D_s^{*-} \pi^+ K^*(892)^+)/\Gamma_{\text{total}}$   $\Gamma_{212}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
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**<7 × 10<sup>-3</sup>**      90      <sup>1</sup> ALBRECHT    93E    ARG     $e^+e^- \rightarrow \gamma(4S)$

<sup>1</sup> ALBRECHT 93E reports  $< 1.1 \times 10^{-2}$  from a measurement of  $[\Gamma(B^+ \rightarrow D_s^{*-} \pi^+ K^*(892)^+)/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi\pi^+)]$  assuming  $B(D_s^+ \rightarrow \phi\pi^+) = 0.027$ , which we rescale to our best value  $B(D_s^+ \rightarrow \phi\pi^+) = 4.5 \times 10^{-2}$ .

$\Gamma(D_s^- K^+ K^+)/\Gamma_{\text{total}}$   $\Gamma_{213}/\Gamma$

VALUE (units $10^{-5}$ )	DOCUMENT ID	TECN	COMMENT
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**0.97 ± 0.21 OUR AVERAGE**

0.93 ± 0.22 ± 0.10      <sup>1</sup> WIEHCZYN...15    BELL     $e^+e^- \rightarrow \gamma(4S)$

1.1 ± 0.4 ± 0.2      <sup>1</sup> AUBERT      08G    BABR     $e^+e^- \rightarrow \gamma(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\gamma(4S)$ .

$\Gamma(D_s^- K^+ K^+)/\Gamma(D_s^- \pi^+ K^+)$		$\Gamma_{213}/\Gamma_{209}$		
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
<b>0.054 ± 0.013 ± 0.006</b>	WIEHCZYN...15	BELL	$e^+ e^- \rightarrow \Upsilon(4S)$	

$\Gamma(D_s^{*-} K^+ K^+)/\Gamma_{\text{total}}$		$\Gamma_{214}/\Gamma$		
<u>VALUE (units 10<sup>-4</sup>)</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>&lt;0.15</b>	90	<sup>1</sup> AUBERT	08G	BABR $e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\eta_c K^+)/\Gamma_{\text{total}}$		$\Gamma_{215}/\Gamma$		
<u>VALUE (units 10<sup>-3</sup>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
<b>0.96 ± 0.11 OUR AVERAGE</b>				

0.87 ± 0.15	<sup>1,2</sup> AUBERT	06E	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
1.20 <sup>+0.24</sup> <sub>-0.19</sub> ± 0.13	<sup>3</sup> AUBERT,B	05L	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
1.25 ± 0.14 <sup>+0.39</sup> <sub>-0.40</sub>	<sup>4</sup> FANG	03	BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
0.69 <sup>+0.26</sup> <sub>-0.21</sub> ± 0.22	<sup>5</sup> EDWARDS	01	CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

1.02 ± 0.12 ± 0.07	<sup>2,6</sup> AUBERT,B	04B	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Perform measurements of absolute branching fractions using a missing mass technique.

<sup>2</sup> The ratio of  $B(B^\pm \rightarrow K^\pm \eta_c) B(\eta_c \rightarrow K \bar{K} \pi) = (7.4 \pm 0.5 \pm 0.7) \times 10^{-5}$  reported in AUBERT,B 04B and  $B(B^\pm \rightarrow K^\pm \eta_c) = (8.7 \pm 1.5) \times 10^{-3}$  reported in AUBERT 06E contribute to the determination of  $B(\eta_c \rightarrow K \bar{K} \pi)$ , which is used by others for normalization.

<sup>3</sup> AUBERT,B 05L reports  $[\Gamma(B^+ \rightarrow \eta_c K^+)/\Gamma_{\text{total}}] \times [B(\eta_c(1S) \rightarrow p \bar{p})] = (1.8_{-0.2}^{+0.3} \pm 0.2) \times 10^{-6}$  which we divide by our best value  $B(\eta_c(1S) \rightarrow p \bar{p}) = (1.50 \pm 0.16) \times 10^{-3}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>4</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>5</sup> EDWARDS 01 assumes equal production of  $B^0$  and  $B^+$  at the  $\Upsilon(4S)$ . The correlated uncertainties (28.3)% from  $B(J/\psi(1S) \rightarrow \gamma \eta_c)$  in those modes have been accounted for.

<sup>6</sup> AUBERT,B 04B reports  $[\Gamma(B^+ \rightarrow \eta_c K^+)/\Gamma_{\text{total}}] \times [B(\eta_c(1S) \rightarrow K \bar{K} \pi)] = (0.074 \pm 0.005 \pm 0.007) \times 10^{-3}$  which we divide by our best value  $B(\eta_c(1S) \rightarrow K \bar{K} \pi) = (7.3 \pm 0.5) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(B^+ \rightarrow \eta_c K^+)/\Gamma_{\text{total}} \times \Gamma(\eta_c(1S) \rightarrow \gamma \gamma)/\Gamma_{\text{total}}$		$\Gamma_{215}/\Gamma \times \Gamma_{47}^{\eta_c(1S)}/\Gamma_{\eta_c(1S)}$		
<u>VALUE (units 10<sup>-6</sup>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	

<b>0.22<sup>+0.09+0.04</sup><sub>-0.07-0.02</sub></b>	<sup>1</sup> WICHT	08	BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\eta_c K^+, \eta_c \rightarrow K_S^0 K^\mp \pi^\pm)/\Gamma_{\text{total}}$   $\Gamma_{216}/\Gamma$

VALUE (units $10^{-6}$ )	DOCUMENT ID	TECN	COMMENT
$26.7 \pm 1.4^{+5.7}_{-5.5}$	1,2 VINOKUROVA 11	BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^0$  and  $B^+$  from Upsilon(4S) decays.

<sup>2</sup> VINOKUROVA 11 reports  $(26.7 \pm 1.4^{+2.9}_{-2.6} \pm 4.9) \times 10^{-6}$ , where the first uncertainty is statistical, the second is due to systematics, and the third comes from interference of  $\eta_c(1S) \rightarrow K_S^0 K^\pm \pi^\mp$  with nonresonant  $K_S^0 K^\pm \pi^\mp$ . We combined both systematic uncertainties to single values.

$\Gamma(\eta_c K^*(892)^+)/\Gamma_{\text{total}}$   $\Gamma_{217}/\Gamma$

VALUE (units $10^{-3}$ )	DOCUMENT ID	TECN	COMMENT
$1.0^{+0.5}_{-0.4} \pm 0.1$	1,2 AUBERT	07AV BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> AUBERT 07AV reports  $[\Gamma(B^+ \rightarrow \eta_c K^*(892)^+)/\Gamma_{\text{total}}] \times [B(\eta_c(1S) \rightarrow p\bar{p})] = (1.57^{+0.56+0.45}_{-0.46-0.36}) \times 10^{-6}$  which we divide by our best value  $B(\eta_c(1S) \rightarrow p\bar{p}) = (1.50 \pm 0.16) \times 10^{-3}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\eta_c K^+ \pi^+ \pi^-)/\Gamma_{\text{total}}$   $\Gamma_{218}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<3.9 \times 10^{-4}$	90	VINOKUROVA 15	BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

$\Gamma(\eta_c K^+ \omega(782))/\Gamma_{\text{total}}$   $\Gamma_{219}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<5.3 \times 10^{-4}$	90	VINOKUROVA 15	BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

$\Gamma(\eta_c K^+ \eta)/\Gamma_{\text{total}}$   $\Gamma_{220}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<2.2 \times 10^{-4}$	90	VINOKUROVA 15	BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

$\Gamma(\eta_c K^+ \pi^0)/\Gamma_{\text{total}}$   $\Gamma_{221}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<6.2 \times 10^{-5}$	90	VINOKUROVA 15	BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

$\Gamma(\eta_c(2S) K^+)/\Gamma_{\text{total}}$   $\Gamma_{222}/\Gamma$

VALUE (units $10^{-4}$ )	DOCUMENT ID	TECN	COMMENT
$3.4 \pm 1.8 \pm 0.3$	<sup>1</sup> AUBERT	06E BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Perform measurements of absolute branching fractions using a missing mass technique.

$\Gamma(\eta_c(2S) K^+, \eta_c \rightarrow p\bar{p})/\Gamma_{\text{total}}$   $\Gamma_{223}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<1.06 \times 10^{-7}$	95	<sup>1</sup> AAIJ	13S LHCB	$pp$ at 7 TeV

<sup>1</sup> Measured relative to  $B^+ \rightarrow J/\psi K^+$  decay with charmonia reconstructed in  $p\bar{p}$  final state and using  $B(B^+ \rightarrow J/\psi K^+) = (1.013 \pm 0.034) \times 10^{-3}$  and  $B(J/\psi \rightarrow p\bar{p}) = (2.17 \pm 0.07) \times 10^{-3}$ .

$$\Gamma(B^+ \rightarrow h_c(1P)K^+)/\Gamma_{\text{total}} \times \Gamma(h_c(1P) \rightarrow \eta_c(1S)\gamma)/\Gamma_{\text{total}} \quad \Gamma_{303}/\Gamma \times \Gamma_4^{h_c(1P)}/\Gamma_{h_c(1P)}$$

VALUE (units $10^{-4}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;0.48</b>	90	<sup>1</sup> AUBERT	08AB BABR	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Uses the production ratio of  $(B^+ B^-)/(B^0 \bar{B}^0) = 1.026 \pm 0.032$  at  $\Upsilon(4S)$ .

$$\Gamma(B^+ \rightarrow \eta_c(2S)K^+)/\Gamma_{\text{total}} \times \Gamma(\eta_c(2S) \rightarrow \gamma\gamma)/\Gamma_{\text{total}} \quad \Gamma_{222}/\Gamma \times \Gamma_{15}^{\eta_c(2S)}/\Gamma_{\eta_c(2S)}$$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;0.18</b>	90	<sup>1</sup> WICHT	08 BELL	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$$\Gamma(\eta_c(2S)K^+, \eta_c \rightarrow K_S^0 K^\mp \pi^\pm)/\Gamma_{\text{total}} \quad \Gamma_{224}/\Gamma$$

VALUE (units $10^{-6}$ )	DOCUMENT ID	TECN	COMMENT
<b><math>3.4^{+2.2+0.5}_{-1.5-0.4}</math></b>	<sup>1,2</sup> VINOKUROVA 11	BELL	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^0$  and  $B^+$  from Upsilon(4S) decays.

<sup>2</sup> The first uncertainty includes both statistical and interference effects while the second is due to systematics.

$$\Gamma(J/\psi(1S)K^+)/\Gamma_{\text{total}} \quad \Gamma_{255}/\Gamma$$

VALUE (units $10^{-4}$ )	EVTS	DOCUMENT ID	TECN	COMMENT
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**10.26 ± 0.31 OUR FIT**

**10.24 ± 0.35 OUR AVERAGE**

$8.1 \pm 1.3 \pm 0.7$		<sup>1</sup> AUBERT	06E BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$10.61 \pm 0.15 \pm 0.48$		<sup>2</sup> AUBERT	05J BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$10.4 \pm 1.1 \pm 0.1$		<sup>3</sup> AUBERT,B	05L BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$10.1 \pm 0.2 \pm 0.7$		<sup>2</sup> ABE	03B BELL	$e^+e^- \rightarrow \Upsilon(4S)$
$10.2 \pm 0.8 \pm 0.7$		<sup>2</sup> JESSOP	97 CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
$9.24 \pm 3.04 \pm 0.05$		<sup>4</sup> BORTOLETTO92	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
$8.09 \pm 3.50 \pm 0.04$	6	<sup>5</sup> ALBRECHT	90J ARG	$e^+e^- \rightarrow \Upsilon(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
$10.1 \pm 0.3 \pm 0.5$		<sup>2</sup> AUBERT	02 BABR	Repl. by AUBERT 05J
$11.0 \pm 1.5 \pm 0.9$	59	<sup>2</sup> ALAM	94 CLE2	Repl. by JESSOP 97
$22 \pm 10 \pm 2$		BUSKULIC	92G ALEP	$e^+e^- \rightarrow Z$
$7 \pm 4$	3	<sup>6</sup> ALBRECHT	87D ARG	$e^+e^- \rightarrow \Upsilon(4S)$
$10 \pm 7 \pm 2$	3	<sup>7</sup> BEBEK	87 CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
$9 \pm 5$	3	<sup>8</sup> ALAM	86 CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Perform measurements of absolute branching fractions using a missing mass technique.

<sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>3</sup> AUBERT,B 05L reports  $[\Gamma(B^+ \rightarrow J/\psi(1S)K^+)/\Gamma_{\text{total}}] \times [B(J/\psi(1S) \rightarrow p\bar{p})] = (2.2 \pm 0.2 \pm 0.1) \times 10^{-6}$  which we divide by our best value  $B(J/\psi(1S) \rightarrow p\bar{p}) = (2.120 \pm 0.029) \times 10^{-3}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>4</sup> BORTOLETTO 92 reports  $(8 \pm 2 \pm 2) \times 10^{-4}$  from a measurement of  $[\Gamma(B^+ \rightarrow J/\psi(1S)K^+)/\Gamma_{\text{total}}] \times [B(J/\psi(1S) \rightarrow e^+e^-)]$  assuming  $B(J/\psi(1S) \rightarrow e^+e^-) = 0.069 \pm 0.009$ , which we rescale to our best value  $B(J/\psi(1S) \rightarrow e^+e^-) = (5.971 \pm$

$0.032) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>5</sup> ALBRECHT 90J reports  $(7 \pm 3 \pm 1) \times 10^{-4}$  from a measurement of  $[\Gamma(B^+ \rightarrow J/\psi(1S)K^+)/\Gamma_{\text{total}}] \times [B(J/\psi(1S) \rightarrow e^+e^-)]$  assuming  $B(J/\psi(1S) \rightarrow e^+e^-) = 0.069 \pm 0.009$ , which we rescale to our best value  $B(J/\psi(1S) \rightarrow e^+e^-) = (5.971 \pm 0.032) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>6</sup> ALBRECHT 87D assume  $B^+ B^- / B^0 \bar{B}^0$  ratio is 55/45. Superseded by ALBRECHT 90J.

<sup>7</sup> BEBEK 87 value has been updated in BERKELMAN 91 to use same assumptions as noted for BORTOLETTO 92.

<sup>8</sup> ALAM 86 assumes  $B^\pm / B^0$  ratio is 60/40.

**$\Gamma(\eta_c K^+)/\Gamma(J/\psi(1S)K^+)$   $\Gamma_{215}/\Gamma_{255}$**

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.84 ± 0.10 OUR AVERAGE</b>			
0.82 ± 0.06 ± 0.09	<sup>1</sup> AAIJ	13S	LHCB $pp$ at 7 TeV
1.33 ± 0.10 ± 0.43	<sup>2</sup> AUBERT,B	04B	BABR $e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> AAIJ 13S reports  $[\Gamma(B^+ \rightarrow \eta_c K^+)/\Gamma(B^+ \rightarrow J/\psi(1S)K^+)] \times [B(\eta_c(1S) \rightarrow p\bar{p})] / [B(J/\psi(1S) \rightarrow p\bar{p})] = 0.578 \pm 0.035 \pm 0.026$  which we multiply or divide by our best values  $B(\eta_c(1S) \rightarrow p\bar{p}) = (1.50 \pm 0.16) \times 10^{-3}$ ,  $B(J/\psi(1S) \rightarrow p\bar{p}) = (2.120 \pm 0.029) \times 10^{-3}$ . Our first error is their experiment's error and our second error is the systematic error from using our best values.

<sup>2</sup> Uses BABAR measurement of  $B(B^+ \rightarrow J/\psi K^+) = (10.1 \pm 0.3 \pm 0.5) \times 10^{-4}$ .

**$\Gamma(B^+ \rightarrow J/\psi(1S)K^+)/\Gamma_{\text{total}} \times \Gamma(J/\psi(1S) \rightarrow \gamma\gamma)/\Gamma_{\text{total}}$   $\Gamma_{255}/\Gamma \times \Gamma_{222}^{J/\psi(1S)}/\Gamma_{J/\psi(1S)}$**

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;0.16</b>	90	<sup>1</sup> WICHT	08	BELL $e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

**$\Gamma(J/\psi(1S)K^+\pi^+\pi^-)/\Gamma_{\text{total}}$   $\Gamma_{257}/\Gamma$**

VALUE (units $10^{-3}$ )	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.81 ± 0.13 OUR AVERAGE</b>					Error includes scale factor of 2.5. See the ideogram below.

0.716 ± 0.010 ± 0.060 <sup>1</sup> GULER 11 BELL  $e^+e^- \rightarrow \Upsilon(4S)$

1.16 ± 0.07 ± 0.09 <sup>1</sup> AUBERT 05R BABR  $e^+e^- \rightarrow \Upsilon(4S)$

0.69 ± 0.18 ± 0.12 <sup>2</sup> ACOSTA 02F CDF  $p\bar{p}$  1.8 TeV

1.39 ± 0.81 ± 0.01 <sup>3</sup> BORTOLETTO92 CLEO  $e^+e^- \rightarrow \Upsilon(4S)$

1.39 ± 0.91 ± 0.01 <sup>6</sup> <sup>4</sup> ALBRECHT 87D ARG  $e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

<1.8 90 <sup>5</sup> ALBRECHT 90J ARG  $e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

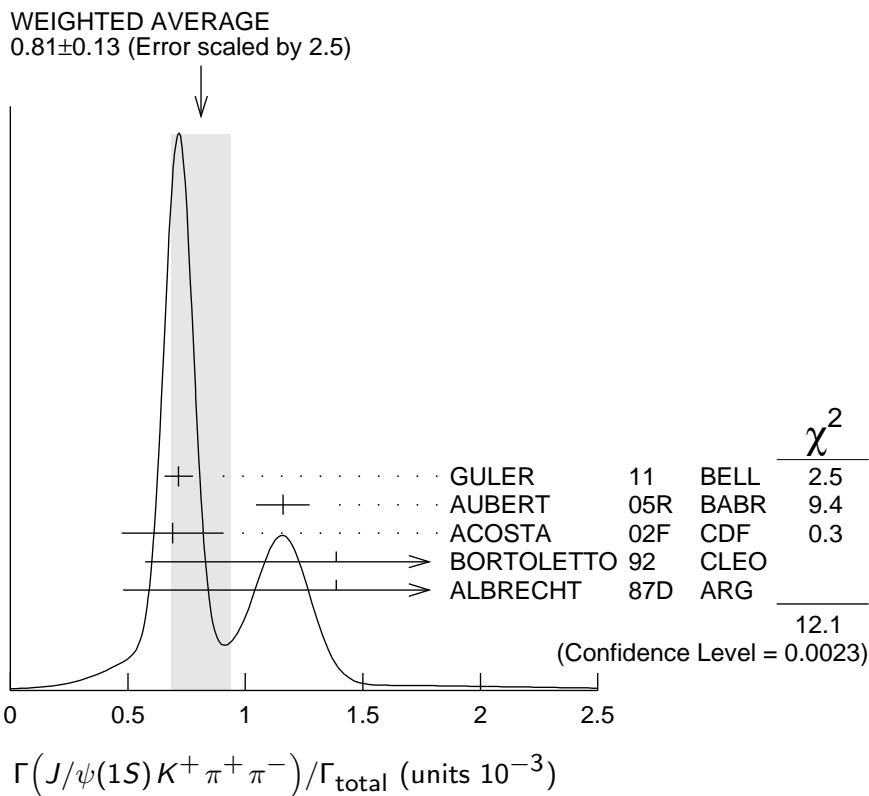
<sup>2</sup> ACOSTA 02F uses as reference of  $B(B \rightarrow J/\psi(1S)K^+) = (10.1 \pm 0.6) \times 10^{-4}$ . The second error includes the systematic error and the uncertainties of the branching ratio.

<sup>3</sup> BORTOLETTO 92 reports  $(1.2 \pm 0.6 \pm 0.4) \times 10^{-3}$  from a measurement of  $[\Gamma(B^+ \rightarrow J/\psi(1S)K^+\pi^+\pi^-)/\Gamma_{\text{total}}] \times [B(J/\psi(1S) \rightarrow e^+e^-)]$  assuming  $B(J/\psi(1S) \rightarrow e^+e^-) = 0.069 \pm 0.009$ , which we rescale to our best value  $B(J/\psi(1S) \rightarrow e^+e^-) =$

$(5.971 \pm 0.032) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>4</sup>ALBRECHT 87D reports  $(1.2 \pm 0.8) \times 10^{-3}$  from a measurement of  $[\Gamma(B^+ \rightarrow J/\psi(1S) K^+ \pi^+ \pi^-)/\Gamma_{\text{total}}] \times [B(J/\psi(1S) \rightarrow e^+ e^-)]$  assuming  $B(J/\psi(1S) \rightarrow e^+ e^-) = 0.069 \pm 0.009$ , which we rescale to our best value  $B(J/\psi(1S) \rightarrow e^+ e^-) = (5.971 \pm 0.032) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value. They actually report  $0.0011 \pm 0.0007$  assuming  $B^+ B^-/B^0 \bar{B}^0$  ratio is 55/45. We rescale to 50/50. Analysis explicitly removes  $B^+ \rightarrow \psi(2S) K^+$ .

<sup>5</sup>ALBRECHT 90J reports  $< 1.6 \times 10^{-3}$  from a measurement of  $[\Gamma(B^+ \rightarrow J/\psi(1S) K^+ \pi^+ \pi^-)/\Gamma_{\text{total}}] \times [B(J/\psi(1S) \rightarrow e^+ e^-)]$  assuming  $B(J/\psi(1S) \rightarrow e^+ e^-) = 0.069$ , which we rescale to our best value  $B(J/\psi(1S) \rightarrow e^+ e^-) = 5.971 \times 10^{-2}$ . Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .



**$\Gamma(J/\psi(1S)K^+K^-K^+)/\Gamma_{\text{total}}$   $\Gamma_{258}/\Gamma$**

VALUE (units $10^{-6}$ )	DOCUMENT ID	TECN	COMMENT
<b>33.7±2.5±1.4</b>	LEES	15	BABR $e^+e^- \rightarrow \Upsilon(4S)$

**$\Gamma(h_c(1P)K^+, h_c \rightarrow J/\psi\pi^+\pi^-)/\Gamma_{\text{total}}$   $\Gamma_{225}/\Gamma$**

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;3.4 × 10<sup>-6</sup></b>	90	<sup>1</sup> AUBERT	05R	BABR $e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .



$\Gamma(X(3730)^0 K^+, X^0 \rightarrow \eta_c \eta) / \Gamma_{\text{total}}$   $\Gamma_{226} / \Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<4.6 \times 10^{-5}$	90	VINOKUROVA 15	BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

$\Gamma(X(3730)^0 K^+, X^0 \rightarrow \eta_c \pi^0) / \Gamma_{\text{total}}$   $\Gamma_{227} / \Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<5.7 \times 10^{-6}$	90	VINOKUROVA 15	BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

$\Gamma(X(3872) K^+) / \Gamma_{\text{total}}$   $\Gamma_{228} / \Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<3.2 \times 10^{-4}$	90	<sup>1</sup> AUBERT	06E BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Perform measurements of absolute branching fractions using a missing mass technique.

$\Gamma(B^+ \rightarrow X(3872) K^+) / \Gamma_{\text{total}} \times \Gamma(X(3872) \rightarrow \gamma\gamma) / \Gamma_{\text{total}}$   $\Gamma_{228} / \Gamma \times \Gamma_7^{X(3872)} / \Gamma_{X(3872)}$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
$<0.24$	90	<sup>1</sup> WICHT	08 BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(X(3872) K^+, X \rightarrow J/\psi \pi^+ \pi^-) / \Gamma_{\text{total}}$   $\Gamma_{230} / \Gamma$

VALUE (units $10^{-6}$ )	DOCUMENT ID	TECN	COMMENT
<b>8.6 ± 0.8 OUR AVERAGE</b>			
8.63 ± 0.82 ± 0.52	<sup>1</sup> CHOI	11 BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
8.4 ± 1.5 ± 0.7	<sup>1</sup> AUBERT	08Y BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
10.1 ± 2.5 ± 1.0	<sup>1</sup> AUBERT	06 BABR	Repl. by AUBERT 08Y
12.8 ± 4.1	<sup>1</sup> AUBERT	05R BABR	Repl. by AUBERT 06
12.5 ± 2.8 ± 0.5	<sup>2</sup> CHOI	03 BELL	Repl. by CHOI 11

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> CHOI 03 reports  $[\Gamma(B^+ \rightarrow X(3872) K^+, X \rightarrow J/\psi \pi^+ \pi^-) / \Gamma_{\text{total}}] / [B(B^+ \rightarrow \psi(2S) K^+)] = 0.0200 \pm 0.0038 \pm 0.0023$  which we multiply by our best value  $B(B^+ \rightarrow \psi(2S) K^+) = (6.26 \pm 0.24) \times 10^{-4}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(X(3872) K^+, X \rightarrow J/\psi \gamma) / \Gamma_{\text{total}}$   $\Gamma_{231} / \Gamma$

VALUE (units $10^{-6}$ )	DOCUMENT ID	TECN	COMMENT
<b>2.1 ± 0.4 OUR AVERAGE</b>	Error includes scale factor of 1.1.		
1.78 <sup>+0.48</sup> <sub>-0.44</sub> ± 0.12	<sup>1</sup> BHARDWAJ	11 BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
2.8 ± 0.8 ± 0.1	<sup>2</sup> AUBERT	09B BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

3.3 ± 1.0 ± 0.3	<sup>1</sup> AUBERT, BE	06M BABR	Repl. by AUBERT 09B
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> Uses  $B(\Upsilon(4S) \rightarrow B^+ B^-) = (51.6 \pm 0.6)\%$  and  $B(\Upsilon(4S) \rightarrow B^0 \bar{B}^0) = (48.4 \pm 0.6)\%$ .

$\Gamma(X(3872)K^*(892)^+, X \rightarrow J/\psi\gamma)/\Gamma_{\text{total}}$   $\Gamma_{246}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;4.8</b>	90	<sup>1</sup> AUBERT	09B BABR	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Uses  $B(\Upsilon(4S) \rightarrow B^+B^-) = (51.6 \pm 0.6)\%$  and  $B(\Upsilon(4S) \rightarrow B^0\bar{B}^0) = (48.4 \pm 0.6)\%$ .

$\Gamma(X(3872)K^+, X \rightarrow \psi(2S)\gamma)/\Gamma_{\text{total}}$   $\Gamma_{232}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>4 ± 4 OUR AVERAGE</b>		Error includes scale factor of 2.5.		
$0.83^{+1.98}_{-1.83} \pm 0.44$		<sup>1,2</sup> BHARDWAJ	11 BELL	$e^+e^- \rightarrow \Upsilon(4S)$
$9.5 \pm 2.7 \pm 0.6$		<sup>3</sup> AUBERT	09B BABR	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> BHARDWAJ 11 measurement is equivalent to a limit of  $< 3.45 \times 10^{-6}$  at 90% CL.

<sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>3</sup> Uses  $B(\Upsilon(4S) \rightarrow B^+B^-) = (51.6 \pm 0.6)\%$  and  $B(\Upsilon(4S) \rightarrow B^0\bar{B}^0) = (48.4 \pm 0.6)\%$ .

$\Gamma(X(3872)K^*(892)^+, X \rightarrow \psi(2S)\gamma)/\Gamma_{\text{total}}$   $\Gamma_{247}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;28</b>	90	<sup>1</sup> AUBERT	09B BABR	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Uses  $B(\Upsilon(4S) \rightarrow B^+B^-) = (51.6 \pm 0.6)\%$  and  $B(\Upsilon(4S) \rightarrow B^0\bar{B}^0) = (48.4 \pm 0.6)\%$ .

$\Gamma(X(3872)K^+, X \rightarrow D^0\bar{D}^0)/\Gamma_{\text{total}}$   $\Gamma_{234}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;6.0 × 10<sup>-5</sup></b>	90	<sup>1</sup> CHISTOV	04 BELL	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(X(3872)K^+, X \rightarrow D^+D^-)/\Gamma_{\text{total}}$   $\Gamma_{235}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;4.0 × 10<sup>-5</sup></b>	90	<sup>1</sup> CHISTOV	04 BELL	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(X(3872)K^+, X \rightarrow D^0\bar{D}^0\pi^0)/\Gamma_{\text{total}}$   $\Gamma_{236}/\Gamma$

VALUE (units $10^{-4}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b><math>1.02 \pm 0.31^{+0.21}_{-0.29}</math></b>		<sup>1</sup> GOKHROO	06 BELL	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

<0.6	90	<sup>2</sup> CHISTOV	04 BELL	Repl. by GOKHROO 06
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<sup>1</sup> Measure the near-threshold enhancements in the  $(D^0\bar{D}^0\pi^0)$  system at a mass  $3875.2 \pm 0.7^{+0.3}_{-1.6} \pm 0.8$  MeV/ $c^2$ .

<sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(X(3872)K^+, X \rightarrow \bar{D}^{*0}D^0)/\Gamma_{\text{total}}$   $\Gamma_{237}/\Gamma$

VALUE (units $10^{-4}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>0.85 ± 0.26 OUR AVERAGE</b>		Error includes scale factor of 1.4.		
$0.77 \pm 0.16 \pm 0.10$		<sup>1</sup> AUSHEV	10 BELL	$e^+e^- \rightarrow \Upsilon(4S)$
$1.67 \pm 0.36 \pm 0.47$		<sup>1</sup> AUBERT	08B BABR	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(X(3872)^0 K^+, X^0 \rightarrow \eta_c \pi^+ \pi^-) / \Gamma_{\text{total}}$   $\Gamma_{238} / \Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<3.0 \times 10^{-5}$	90	VINOKUROVA 15	BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

$\Gamma(X(3872)^0 K^+, X^0 \rightarrow \eta_c \omega(782)) / \Gamma_{\text{total}}$   $\Gamma_{239} / \Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<6.9 \times 10^{-5}$	90	VINOKUROVA 15	BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

$\Gamma(X(3915)^0 K^+, X^0 \rightarrow \eta_c \eta) / \Gamma_{\text{total}}$   $\Gamma_{240} / \Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<3.3 \times 10^{-5}$	90	VINOKUROVA 15	BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

$\Gamma(X(3915)^0 K^+, X^0 \rightarrow \eta_c \pi^0) / \Gamma_{\text{total}}$   $\Gamma_{241} / \Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<1.8 \times 10^{-5}$	90	VINOKUROVA 15	BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

$\Gamma(X(4014)^0 K^+, X^0 \rightarrow \eta_c \eta) / \Gamma_{\text{total}}$   $\Gamma_{242} / \Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<3.9 \times 10^{-5}$	90	VINOKUROVA 15	BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

$\Gamma(X(4014)^0 K^+, X^0 \rightarrow \eta_c \pi^0) / \Gamma_{\text{total}}$   $\Gamma_{243} / \Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<1.2 \times 10^{-5}$	90	VINOKUROVA 15	BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

$\Gamma(X(3900)^0 K^+, X^0 \rightarrow \eta_c \pi^+ \pi^-) / \Gamma_{\text{total}}$   $\Gamma_{244} / \Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<4.7 \times 10^{-5}$	90	VINOKUROVA 15	BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

$\Gamma(X(4020)^0 K^+, X^0 \rightarrow \eta_c \pi^+ \pi^-) / \Gamma_{\text{total}}$   $\Gamma_{245} / \Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<1.6 \times 10^{-5}$	90	VINOKUROVA 15	BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

$\Gamma(X(3872) K^+, X \rightarrow J/\psi(1S) \eta) / \Gamma_{\text{total}}$   $\Gamma_{233} / \Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<7.7 \times 10^{-6}$	90	<sup>1</sup> AUBERT 04Y	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(X(3872)^+ K^0, X^+ \rightarrow J/\psi(1S) \pi^+ \pi^0) / \Gamma_{\text{total}}$   $\Gamma_{248} / \Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
$< 6.1$	90	<sup>1,2</sup> CHOI 11	BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$<22$	90	<sup>3</sup> AUBERT 05B	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes  $\pi^+ \pi^0$  originates from  $\rho^+$ .

<sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>3</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ . The isovector- $X$  hypothesis is excluded with a likelihood test at  $1 \times 10^{-4}$  level.

$\Gamma(X(3872)K^0\pi^+, X \rightarrow J/\psi(1S)\pi^+\pi^-)/\Gamma_{\text{total}}$   $\Gamma_{249}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>10.6 ± 3.0 ± 0.9</b>		BALA	15	BELL $e^+e^- \rightarrow \Upsilon(4S)$

$\Gamma(X(4430)^+K^0, X^+ \rightarrow J/\psi\pi^+)/\Gamma_{\text{total}}$   $\Gamma_{250}/\Gamma$

VALUE (units $10^{-5}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;1.5</b>	95	<sup>1</sup> AUBERT	09AA	BABR $e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(X(4430)^+K^0, X^+ \rightarrow \psi(2S)\pi^+)/\Gamma_{\text{total}}$   $\Gamma_{251}/\Gamma$

VALUE (units $10^{-5}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;4.7</b>	95	<sup>1</sup> AUBERT	09AA	BABR $e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(X(4260)^0K^+, X^0 \rightarrow J/\psi\pi^+\pi^-)/\Gamma_{\text{total}}$   $\Gamma_{252}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;29</b>	95	<sup>1</sup> AUBERT	06	BABR $e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(X(3915)K^+, X \rightarrow J/\psi\gamma)/\Gamma_{\text{total}}$   $\Gamma_{253}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;14</b>	90	<sup>1</sup> AUBERT, BE	06M	BABR $e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(X(3930)^0K^+, X^0 \rightarrow J/\psi\gamma)/\Gamma_{\text{total}}$   $\Gamma_{254}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;2.5</b>	90	<sup>1</sup> AUBERT, BE	06M	BABR $e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(J/\psi(1S)K^0\pi^+)/\Gamma_{\text{total}}$   $\Gamma_{256}/\Gamma$

VALUE (units $10^{-3}$ )	CL%	DOCUMENT ID	TECN	COMMENT
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• • • We do not use the following data for averages, fits, limits, etc. • • •

1.101 ± 0.021		<sup>1</sup> AUBERT	09AA	BABR $e^+e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Does not report systematic uncertainties.

$\Gamma(J/\psi(1S)K^*(892)^+)/\Gamma_{\text{total}}$   $\Gamma_{260}/\Gamma$

For polarization information see the Listings at the end of the " $B^0$  Branching Ratios" section.

VALUE (units $10^{-3}$ )	EVTS	DOCUMENT ID	TECN	COMMENT
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**1.43 ± 0.08 OUR FIT**

**1.43 ± 0.08 OUR AVERAGE**

1.78 <sup>+0.36</sup> / <sub>-0.32</sub> ± 0.02		<sup>1,2</sup> AUBERT	07AV	BABR $e^+e^- \rightarrow \Upsilon(4S)$
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1.454 ± 0.047 ± 0.097		<sup>2</sup> AUBERT	05J	BABR $e^+e^- \rightarrow \Upsilon(4S)$
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1.28 ± 0.07 ± 0.14		<sup>2</sup> ABE	02N	BELL $e^+e^- \rightarrow \Upsilon(4S)$
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1.41 ± 0.23 ± 0.24		<sup>2</sup> JESSOP	97	CLE2 $e^+e^- \rightarrow \Upsilon(4S)$
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1.58 ± 0.47 ± 0.27		<sup>3</sup> ABE	96H	CDF	$p\bar{p}$ at 1.8 TeV
1.50 ± 1.08 ± 0.01		<sup>4</sup> BORTOLETTO	092	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
1.85 ± 1.30 ± 0.01	2	<sup>5</sup> ALBRECHT	90J	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

1.37 ± 0.09 ± 0.11		<sup>2</sup> AUBERT	02	BABR	Repl. by AUBERT 05J
1.78 ± 0.51 ± 0.23	13	<sup>2</sup> ALAM	94	CLE2	Sup. by JESSOP 97

<sup>1</sup> AUBERT 07AV reports  $[\Gamma(B^+ \rightarrow J/\psi(1S) K^*(892)^+)/\Gamma_{\text{total}}] \times [B(J/\psi(1S) \rightarrow p\bar{p})] = (3.78^{+0.72+0.28}_{-0.64-0.23}) \times 10^{-6}$  which we divide by our best value  $B(J/\psi(1S) \rightarrow p\bar{p}) = (2.120 \pm 0.029) \times 10^{-3}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>3</sup> ABE 96H assumes that  $B(B^+ \rightarrow J/\psi K^+) = (1.02 \pm 0.14) \times 10^{-3}$ .

<sup>4</sup> BORTOLETTO 92 reports  $(1.3 \pm 0.9 \pm 0.3) \times 10^{-3}$  from a measurement of  $[\Gamma(B^+ \rightarrow J/\psi(1S) K^*(892)^+)/\Gamma_{\text{total}}] \times [B(J/\psi(1S) \rightarrow e^+e^-)]$  assuming  $B(J/\psi(1S) \rightarrow e^+e^-) = 0.069 \pm 0.009$ , which we rescale to our best value  $B(J/\psi(1S) \rightarrow e^+e^-) = (5.971 \pm 0.032) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>5</sup> ALBRECHT 90J reports  $(1.6 \pm 1.1 \pm 0.3) \times 10^{-3}$  from a measurement of  $[\Gamma(B^+ \rightarrow J/\psi(1S) K^*(892)^+)/\Gamma_{\text{total}}] \times [B(J/\psi(1S) \rightarrow e^+e^-)]$  assuming  $B(J/\psi(1S) \rightarrow e^+e^-) = 0.069 \pm 0.009$ , which we rescale to our best value  $B(J/\psi(1S) \rightarrow e^+e^-) = (5.971 \pm 0.032) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

### $\Gamma(J/\psi(1S) K^*(892)^+)/\Gamma(J/\psi(1S) K^+)$ $\Gamma_{260}/\Gamma_{255}$

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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#### **1.39 ± 0.09 OUR AVERAGE**

1.37 ± 0.05 ± 0.08	AUBERT	05J	BABR $e^+e^- \rightarrow \Upsilon(4S)$
1.45 ± 0.20 ± 0.17	<sup>1</sup> JESSOP	97	CLE2 $e^+e^- \rightarrow \Upsilon(4S)$
1.92 ± 0.60 ± 0.17	ABE	96Q	CDF $p\bar{p}$

• • • We do not use the following data for averages, fits, limits, etc. • • •

1.37 ± 0.10 ± 0.08	<sup>2</sup> AUBERT	02	BABR Repl. by AUBERT 05J
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<sup>1</sup> JESSOP 97 assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ . The measurement is actually measured as an average over kaon charged and neutral states.

<sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

### $\Gamma(J/\psi(1S) K(1270)^+)/\Gamma_{\text{total}}$ $\Gamma_{261}/\Gamma$

<u>VALUE (units <math>10^{-3}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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<b>1.80 ± 0.34 ± 0.39</b>	<sup>1</sup> ABE	01L	BELL $e^+e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Uses the PDG value of  $B(B^+ \rightarrow J/\psi(1S) K^+) = (1.00 \pm 0.10) \times 10^{-3}$ .

### $\Gamma(J/\psi(1S) K(1400)^+)/\Gamma(J/\psi(1S) K(1270)^+)$ $\Gamma_{262}/\Gamma_{261}$

<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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<b>&lt; 0.30</b>	90	ABE	01L	BELL $e^+e^- \rightarrow \Upsilon(4S)$
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$\Gamma(J/\psi(1S)\eta K^+)/\Gamma_{\text{total}}$   $\Gamma_{263}/\Gamma$

VALUE (units $10^{-5}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>12.4 ± 1.4 OUR AVERAGE</b>				
12.7 ± 1.1 ± 1.1		<sup>1</sup> IWASHITA	14 BELL	$e^+e^- \rightarrow \Upsilon(4S)$
10.8 ± 2.3 ± 2.4		<sup>1</sup> AUBERT	04Y BABR	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\chi^{c-odd}(3872)K^+, \chi^{c-odd} \rightarrow J/\psi\eta)/\Gamma_{\text{total}}$   $\Gamma_{264}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt; 3.8 × 10<sup>-6</sup></b>	90	IWASHITA	14 BELL	$e^+e^- \rightarrow \Upsilon(4S)$

$\Gamma(\psi(4160)K^+, \psi \rightarrow J/\psi\eta)/\Gamma_{\text{total}}$   $\Gamma_{265}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt; 7.4 × 10<sup>-6</sup></b>	90	IWASHITA	14 BELL	$e^+e^- \rightarrow \Upsilon(4S)$

$\Gamma(J/\psi(1S)\eta' K^+)/\Gamma_{\text{total}}$   $\Gamma_{266}/\Gamma$

VALUE (units $10^{-5}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt; 8.8</b>	90	<sup>1</sup> XIE	07 BELL	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(J/\psi(1S)\phi K^+)/\Gamma_{\text{total}}$   $\Gamma_{267}/\Gamma$

VALUE (units $10^{-5}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>5.0 ± 0.4 OUR AVERAGE</b>				
5.00 ± 0.37 ± 0.15		LEES	15 BABR	$e^+e^- \rightarrow \Upsilon(4S)$
4.4 ± 1.4 ± 0.5		<sup>1</sup> AUBERT	03O BABR	$e^+e^- \rightarrow \Upsilon(4S)$
8.8 $^{+3.5}_{-3.0}$ ± 1.3		<sup>2</sup> ANASTASSOV 00	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> ANASTASSOV 00 finds 10 events on a background of  $0.5 \pm 0.2$ . Assumes equal production of  $B^0$  and  $B^+$  at the  $\Upsilon(4S)$ , a uniform Dalitz plot distribution, isotropic  $J/\psi(1S)$  and  $\phi$  decays, and  $B(B^+ \rightarrow J/\psi(1S)\phi K^+) = B(B^0 \rightarrow J/\psi(1S)\phi K^0)$ .

$\Gamma(X(4140)K^+, X \rightarrow J/\psi(1S)\phi)/\Gamma(J/\psi(1S)\phi K^+)$   $\Gamma_{268}/\Gamma_{267}$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b>0.19 ± 0.07 ± 0.04</b>		<sup>1</sup> ABAZOV	14A D0	$p\bar{p}$ at 1.96 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •				
< 0.133	90	LEES	15 BABR	$e^+e^- \rightarrow \Upsilon(4S)$
< 0.07	90	<sup>2</sup> AAIJ	12AA LHCB	$pp$ at 7 TeV

<sup>1</sup> Reported a threshold enhancement in the  $J/\psi\phi$  mass distribution consistent with the  $X(4140)$  state with a statistical significance of 3.1 standard deviations.

<sup>2</sup> Branching fractions are normalized to  $382 \pm 22$  events of  $B^+ \rightarrow J/\psi\phi K^+$ .

$\Gamma(X(4274)K^+, X \rightarrow J/\psi(1S)\phi)/\Gamma(J/\psi(1S)\phi K^+)$   $\Gamma_{269}/\Gamma_{267}$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt; 0.08</b>	90	<sup>1</sup> AAIJ	12AA LHCB	$pp$ at 7 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •				
< 0.181	90	LEES	15 BABR	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Branching fractions are normalized to  $382 \pm 22$  events of  $B^+ \rightarrow J/\psi\phi K^+$ .

$$\Gamma(J/\psi(1S)\omega K^+)/\Gamma_{\text{total}} \qquad \Gamma_{270}/\Gamma$$

VALUE (units $10^{-4}$ )	DOCUMENT ID	TECN	COMMENT
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$3.2 \pm 0.1^{+0.6}_{-0.3}$	<sup>1</sup> DEL-AMO-SA..10B	BABR	$e^+e^- \rightarrow \Upsilon(4S)$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

$3.5 \pm 0.2 \pm 0.4$	<sup>1</sup> AUBERT	08W BABR	Repl. by DEL-AMO-SANCHEZ 10B
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$$\Gamma(X(3872)K^+, X \rightarrow J/\psi\omega)/\Gamma_{\text{total}} \qquad \Gamma_{271}/\Gamma$$

VALUE (units $10^{-6}$ )	DOCUMENT ID	TECN	COMMENT
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$6 \pm 2 \pm 1$	<sup>1</sup> DEL-AMO-SA..10B	BABR	$e^+e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$$\Gamma(X(3872)K^+, X \rightarrow p\bar{p})/\Gamma_{\text{total}} \qquad \Gamma_{229}/\Gamma$$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
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$< 1.7 \times 10^{-8}$	95	<sup>1</sup> AAIJ	13S LHCB	$pp$ at 7 TeV
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<sup>1</sup> Measured relative to  $B^+ \rightarrow J/\psi K^+$  decay with charmonia reconstructed in  $p\bar{p}$  final state and using  $B(B^+ \rightarrow J/\psi K^+) = (1.013 \pm 0.034) \times 10^{-3}$  and  $B(J/\psi \rightarrow p\bar{p}) = (2.17 \pm 0.07) \times 10^{-3}$ .

$$\Gamma(X(3915)K^+, X \rightarrow J/\psi\omega)/\Gamma_{\text{total}} \qquad \Gamma_{272}/\Gamma$$

VALUE (units $10^{-5}$ )	DOCUMENT ID	TECN	COMMENT
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$3.0^{+0.7+0.5}_{-0.6-0.3}$	<sup>1</sup> DEL-AMO-SA..10B	BABR	$e^+e^- \rightarrow \Upsilon(4S)$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

$4.9^{+1.0}_{-0.9} \pm 0.5$	<sup>1</sup> AUBERT	08W BABR	Repl. by DEL-AMO-SANCHEZ 10B
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$$\Gamma(X(3915)K^+, X \rightarrow p\bar{p})/\Gamma_{\text{total}} \qquad \Gamma_{259}/\Gamma$$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
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$< 7.1 \times 10^{-8}$	95	<sup>1</sup> AAIJ	13S LHCB	$pp$ at 7 TeV
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<sup>1</sup> Measured relative to  $B^+ \rightarrow J/\psi K^+$  decay with charmonia reconstructed in  $p\bar{p}$  final state and using  $B(B^+ \rightarrow J/\psi K^+) = (1.013 \pm 0.034) \times 10^{-3}$  and  $B(J/\psi \rightarrow p\bar{p}) = (2.17 \pm 0.07) \times 10^{-3}$ .

$$\Gamma(J/\psi(1S)\pi^+)/\Gamma_{\text{total}} \qquad \Gamma_{273}/\Gamma$$

VALUE	DOCUMENT ID	TECN	COMMENT
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$(4.1 \pm 0.4) \times 10^{-5}$ <b>OUR FIT</b>	Error includes scale factor of 2.6.		
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$(3.8 \pm 0.6 \pm 0.3) \times 10^{-5}$	<sup>1</sup> ABE	03B BELL	$e^+e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(J/\psi(1S)\pi^+)/\Gamma(J/\psi(1S)K^+)$   $\Gamma_{273}/\Gamma_{255}$

<u>VALUE (units <math>10^{-2}</math>)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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**4.0 ± 0.4 OUR FIT** Error includes scale factor of 3.3.

**4.0 ± 0.4 OUR AVERAGE** Error includes scale factor of 3.2.

3.83 ± 0.11 ± 0.07		AAIJ	12AC LHCB	$pp$ at 7 TeV
4.86 ± 0.82 ± 0.15		ABULENCIA	09 CDF	$p\bar{p}$ at 1.96 TeV
5.37 ± 0.45 ± 0.11		AUBERT	04P BABR	$e^+e^- \rightarrow \Upsilon(4S)$
5.0 $^{+1.9}_{-1.7}$ ± 0.1		ABE	96R CDF	$p\bar{p}$ 1.8 TeV
5.2 ± 2.4		BISHAI	96 CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

3.91 ± 0.78 ± 0.19		AUBERT	02F BABR	Repl. by AUBERT 04P
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4.3 ± 2.3	5	<sup>1</sup> ALEXANDER	95 CLE2	Sup. by BISHAI 96
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<sup>1</sup> Assumes equal production of  $B^+B^-$  and  $B^0\bar{B}^0$  on  $\Upsilon(4S)$ .

$\Gamma(J/\psi(1S)\rho^+)/\Gamma_{\text{total}}$   $\Gamma_{274}/\Gamma$

<u>VALUE (units <math>10^{-5}</math>)</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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**5.0 ± 0.7 ± 0.3** <sup>1</sup>AUBERT 07AC BABR  $e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

< 77	90	BISHAI	96 CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(J/\psi(1S)\pi^+\pi^0\text{nonresonant})/\Gamma_{\text{total}}$   $\Gamma_{275}/\Gamma$

<u>VALUE (units <math>10^{-5}</math>)</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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**< 0.73** <sup>1</sup>AUBERT 07AC BABR  $e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(J/\psi(1S)a_1(1260)^+)/\Gamma_{\text{total}}$   $\Gamma_{276}/\Gamma$

<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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**< 1.2 × 10<sup>-3</sup>** 90 BISHAI 96 CLE2  $e^+e^- \rightarrow \Upsilon(4S)$

$\Gamma(J/\psi p\bar{p}\pi^+)/\Gamma_{\text{total}}$   $\Gamma_{277}/\Gamma$

<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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**< 5.0 × 10<sup>-7</sup>** 90 <sup>1</sup>AAIJ 13Z LHCB  $pp$  at 7 TeV

<sup>1</sup> Uses  $B(B_S^0 \rightarrow J/\psi(1S)\pi^+\pi^-) = (1.98 \pm 0.20) \times 10^{-4}$ .

$\Gamma(J/\psi(1S)\rho\bar{\Lambda})/\Gamma_{\text{total}}$   $\Gamma_{278}/\Gamma$

<u>VALUE (units <math>10^{-6}</math>)</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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**11.8 ± 3.1 OUR AVERAGE**

11.7 ± 2.8 $^{+1.8}_{-2.3}$		<sup>1</sup> XIE	05 BELL	$e^+e^- \rightarrow \Upsilon(4S)$
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12 $^{+9}_{-6}$		<sup>1</sup> AUBERT	03K BABR	$e^+e^- \rightarrow \Upsilon(4S)$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

< 41	90	ZANG	04 BELL	$e^+e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .



$\Gamma(J/\psi(1S)\bar{\Sigma}^0 p)/\Gamma_{\text{total}}$   $\Gamma_{279}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<1.1 \times 10^{-5}$	90	<sup>1</sup> XIE	05 BELL	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(J/\psi(1S)D^+)/\Gamma_{\text{total}}$   $\Gamma_{280}/\Gamma$

VALUE (units $10^{-5}$ )	CL%	DOCUMENT ID	TECN	COMMENT
$<12$	90	<sup>1</sup> AUBERT	05U BABR	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(J/\psi(1S)\bar{D}^0 \pi^+)/\Gamma_{\text{total}}$   $\Gamma_{281}/\Gamma$

VALUE (units $10^{-5}$ )	CL%	DOCUMENT ID	TECN	COMMENT
$<2.5$	90	<sup>1</sup> ZHANG	05B BELL	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$<5.2$	90	<sup>1</sup> AUBERT	05R BABR	$e^+e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\psi(2S)\pi^+)/\Gamma_{\text{total}}$   $\Gamma_{282}/\Gamma$

VALUE (units $10^{-5}$ )	DOCUMENT ID	TECN	COMMENT
$2.44 \pm 0.22 \pm 0.20$	<sup>1</sup> BHARDWAJ	08 BELL	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\psi(2S)\pi^+)/\Gamma(\psi(2S)K^+)$   $\Gamma_{282}/\Gamma_{283}$

VALUE (units $10^{-2}$ )	DOCUMENT ID	TECN	COMMENT
<b><math>3.97 \pm 0.29</math> OUR AVERAGE</b>			
$3.95 \pm 0.40 \pm 0.12$	AAIJ	12AC LHCB	$pp$ at 7 TeV
$3.99 \pm 0.36 \pm 0.17$	BHARDWAJ	08 BELL	$e^+e^- \rightarrow \Upsilon(4S)$

$\Gamma(\psi(2S)K^+)/\Gamma_{\text{total}}$   $\Gamma_{283}/\Gamma$

VALUE (units $10^{-4}$ )	EVTS	DOCUMENT ID	TECN	COMMENT
<b><math>6.26 \pm 0.24</math> OUR FIT</b>				
<b><math>6.5 \pm 0.4</math> OUR AVERAGE</b>				

$6.65 \pm 0.17 \pm 0.55$		<sup>1</sup> GULER	11 BELL	$e^+e^- \rightarrow \Upsilon(4S)$
$4.9 \pm 1.6 \pm 0.4$		<sup>2</sup> AUBERT	06E BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$6.17 \pm 0.32 \pm 0.44$		<sup>1</sup> AUBERT	05J BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$7.8 \pm 0.7 \pm 0.9$		<sup>1</sup> RICHICHI	01 CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
$18 \pm 8 \pm 4$	5	<sup>1</sup> ALBRECHT	90J ARG	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$6.9 \pm 0.6$		<sup>1</sup> ABE	03B BELL	Repl. by GULER 11
$6.4 \pm 0.5 \pm 0.8$		<sup>1</sup> AUBERT	02 BABR	Repl. by AUBERT 05J
$6.1 \pm 2.3 \pm 0.9$	7	<sup>1</sup> ALAM	94 CLE2	Repl. by RICHICHI 01
$<5$ at 90% CL		<sup>1</sup> BORTOLETTO	92 CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
$22 \pm 17$	3	<sup>3</sup> ALBRECHT	87D ARG	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> Perform measurements of absolute branching fractions using a missing mass technique.

<sup>3</sup> ALBRECHT 87D assume  $B^+ B^- / B^0 \bar{B}^0$  ratio is 55/45. Superseded by ALBRECHT 90J.

$\Gamma(\psi(2S)K^+)/\Gamma(J/\psi(1S)K^+)$   $\Gamma_{283}/\Gamma_{255}$

VALUE	DOCUMENT ID	TECN	COMMENT
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**0.610±0.019 OUR FIT**  
**0.603±0.021 OUR AVERAGE**

0.59 ±0.11 ±0.02	<sup>1</sup> AAIJ	13S	LHCB $p\bar{p}$ at 7 TeV
0.604±0.018±0.013	<sup>2,3</sup> AAIJ	12L	LHCB $p\bar{p}$ at 7 TeV
0.63 ±0.05 ±0.08	ABAZOV	09Y	D0 $p\bar{p}$ at 1.96 TeV
0.558±0.082±0.056	ABE	98O	CDF $p\bar{p}$ 1.8 TeV

• • • We do not use the following data for averages, fits, limits, etc. • • •

0.64 ±0.06 ±0.07	<sup>4</sup> AUBERT	02	BABR $e^+e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> AAIJ 13S reports  $[\Gamma(B^+ \rightarrow \psi(2S)K^+)/\Gamma(B^+ \rightarrow J/\psi(1S)K^+)] \times [B(\psi(2S) \rightarrow p\bar{p})] / [B(J/\psi(1S) \rightarrow p\bar{p})] = 0.080 \pm 0.012 \pm 0.009$  which we multiply or divide by our best values  $B(\psi(2S) \rightarrow p\bar{p}) = (2.88 \pm 0.09) \times 10^{-4}$ ,  $B(J/\psi(1S) \rightarrow p\bar{p}) = (2.120 \pm 0.029) \times 10^{-3}$ . Our first error is their experiment's error and our second error is the systematic error from using our best values.

<sup>2</sup> AAIJ 12L reports  $0.594 \pm 0.006 \pm 0.016 \pm 0.015$  from a measurement of  $[\Gamma(B^+ \rightarrow \psi(2S)K^+)/\Gamma(B^+ \rightarrow J/\psi(1S)K^+)] \times [B(J/\psi(1S) \rightarrow e^+e^-)] / [B(\psi(2S) \rightarrow e^+e^-)]$  assuming  $B(J/\psi(1S) \rightarrow e^+e^-) = (5.94 \pm 0.06) \times 10^{-2}$ ,  $B(\psi(2S) \rightarrow e^+e^-) = (7.72 \pm 0.17) \times 10^{-3}$ , which we rescale to our best values  $B(J/\psi(1S) \rightarrow e^+e^-) = (5.971 \pm 0.032) \times 10^{-2}$ ,  $B(\psi(2S) \rightarrow e^+e^-) = (7.89 \pm 0.17) \times 10^{-3}$ . Our first error is their experiment's error and our second error is the systematic error from using our best values.

<sup>3</sup> Assumes  $B(J/\psi \rightarrow \mu^+\mu^-) / B(\psi(2S) \rightarrow \mu^+\mu^-) = B(J/\psi \rightarrow e^+e^-) / B(\psi(2S) \rightarrow e^+e^-) = 7.69 \pm 0.19$ .

<sup>4</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\psi(2S)K^*(892)^+)/\Gamma_{total}$   $\Gamma_{284}/\Gamma$

VALUE (units $10^{-4}$ )	CL%	DOCUMENT ID	TECN	COMMENT
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**6.7 ±1.4 OUR AVERAGE** Error includes scale factor of 1.3.

5.92±0.85±0.89		<sup>1</sup> AUBERT	05J	BABR $e^+e^- \rightarrow \Upsilon(4S)$
9.2 ±1.9 ±1.2		<sup>1</sup> RICHICHI	01	CLE2 $e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

<30	90	<sup>1</sup> ALAM	94	CLE2 Repl. by RICHICHI 01
<35	90	<sup>1</sup> BORTOLETTO92	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
<49	90	<sup>1</sup> ALBRECHT	90J	ARG $e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\psi(2S)K^*(892)^+)/\Gamma(\psi(2S)K^+)$   $\Gamma_{284}/\Gamma_{283}$

VALUE	DOCUMENT ID	TECN	COMMENT
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<b>0.96±0.15±0.09</b>	AUBERT	05J	BABR $e^+e^- \rightarrow \Upsilon(4S)$
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$\Gamma(\psi(2S)K^0\pi^+)/\Gamma_{total}$   $\Gamma_{285}/\Gamma$

VALUE (units $10^{-3}$ )	DOCUMENT ID	TECN	COMMENT
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• • • We do not use the following data for averages, fits, limits, etc. • • •

0.588±0.034	<sup>1</sup> AUBERT	09AA	BABR $e^+e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Does not report systematic uncertainties.

$\Gamma(\psi(2S)K^+\pi^+\pi^-)/\Gamma_{\text{total}}$   $\Gamma_{286}/\Gamma$ 

VALUE (units $10^{-4}$ )	EVTS	DOCUMENT ID	TECN	COMMENT
<b>4.3 ± 0.5 OUR AVERAGE</b>				
4.31 ± 0.20 ± 0.50		<sup>1</sup> GULER	11 BELL	$e^+e^- \rightarrow \Upsilon(4S)$
19 ± 11 ± 4	3	<sup>1</sup> ALBRECHT	90J ARG	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

 $\Gamma(\psi(3770)K^+)/\Gamma_{\text{total}}$   $\Gamma_{287}/\Gamma$ 

VALUE (units $10^{-3}$ )	DOCUMENT ID	TECN	COMMENT
<b>0.49 ± 0.13 OUR AVERAGE</b>			
3.5 ± 2.5 ± 0.3	<sup>1</sup> AUBERT	06E BABR	$e^+e^- \rightarrow \Upsilon(4S)$
0.48 ± 0.11 ± 0.07	<sup>2</sup> CHISTOV	04 BELL	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Perform measurements of absolute branching fractions using a missing mass technique.

<sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

 $\Gamma(\psi(3770)K^+, \psi \rightarrow D^0\bar{D}^0)/\Gamma_{\text{total}}$   $\Gamma_{288}/\Gamma$ 

VALUE (units $10^{-4}$ )	DOCUMENT ID	TECN	COMMENT
<b>1.5 ± 0.5 OUR AVERAGE</b>	Error includes scale factor of 1.4.		
1.18 ± 0.41 ± 0.15	<sup>1</sup> LEES	15c BABR	$e^+e^- \rightarrow \Upsilon(4S)$
2.2 ± 0.5 ± 0.3	<sup>1</sup> BRODZICKA	08 BELL	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
1.41 ± 0.30 ± 0.22	<sup>1</sup> AUBERT	08B BABR	Repl. by LEES 15C
3.4 ± 0.8 ± 0.5	<sup>1</sup> CHISTOV	04 BELL	Repl. by BRODZICKA 08

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

 $\Gamma(\psi(3770)K^+, \psi \rightarrow D^+D^-)/\Gamma_{\text{total}}$   $\Gamma_{289}/\Gamma$ 

VALUE (units $10^{-4}$ )	DOCUMENT ID	TECN	COMMENT
<b>0.94 ± 0.35 OUR AVERAGE</b>			
0.84 ± 0.32 ± 0.21	<sup>1</sup> AUBERT	08B BABR	$e^+e^- \rightarrow \Upsilon(4S)$
1.4 ± 0.8 ± 0.2	<sup>1</sup> CHISTOV	04 BELL	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

 $\Gamma(\psi(4040)K^+)/\Gamma_{\text{total}}$   $\Gamma_{290}/\Gamma$ 

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt; 1.3 × 10<sup>-4</sup></b>	90	AAIJ	13BC LHCb	$pp$ at 7, 8 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •				
< 3.0 × 10 <sup>-3</sup>	90	<sup>1</sup> IWASHITA	14 BELL	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> IWASHITA 14 reports  $[\Gamma(B^+ \rightarrow \psi(4040)K^+)/\Gamma_{\text{total}}] \times [B(\psi(4040) \rightarrow J/\psi\eta)] < 15.5 \times 10^{-6}$  which we divide by our best value  $B(\psi(4040) \rightarrow J/\psi\eta) = 5.2 \times 10^{-3}$ .

 $\Gamma(\psi(4160)K^+)/\Gamma_{\text{total}}$   $\Gamma_{291}/\Gamma$ 

VALUE (units $10^{-4}$ )	DOCUMENT ID	TECN	COMMENT
<b>5.1<sup>+1.3+2.5</sup><sub>-1.2-2.4</sub></b>	<sup>1</sup> AAIJ	13BC LHCb	$pp$ at 7, 8 TeV

<sup>1</sup> AAIJ 13BC reports  $[\Gamma(B^+ \rightarrow \psi(4160)K^+)/\Gamma_{\text{total}}] \times B(\psi(4160) \rightarrow \mu^+\mu^-) = (3.5^{+0.9}_{-0.8}) \times 10^{-9}$  which we divide by our best value  $B(\psi(4160) \rightarrow e^+e^-) = (6.9 \pm 3.3) \times 10^{-6}$  assuming lepton universality. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\psi(4160)K^+, \psi \rightarrow \bar{D}^0 D^0)/\Gamma_{\text{total}}$   $\Gamma_{292}/\Gamma$ 

VALUE (units $10^{-4}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>0.84<math>\pm</math>0.41<math>\pm</math>0.33</b>		<sup>1</sup> LEES	15C BABR	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

 $\Gamma(\chi_{c0}\pi^+, \chi_{c0} \rightarrow \pi^+\pi^-)/\Gamma_{\text{total}}$   $\Gamma_{293}/\Gamma$ 

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;0.1</b>	90	<sup>1</sup> AUBERT	09L BABR	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

<0.3	90	<sup>1</sup> AUBERT,B	05G BABR	Repl. by AUBERT 09L
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

 $\Gamma(\chi_{c0}(1P)K^+)/\Gamma_{\text{total}}$   $\Gamma_{294}/\Gamma$ 

VALUE (units $10^{-4}$ )	CL%	DOCUMENT ID	TECN	COMMENT
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**1.50 $^{+0.15}_{-0.14}$  OUR AVERAGE**

1.84 $\pm$ 0.25 $\pm$ 0.14		<sup>1,2</sup> LEES	12O BABR	$e^+e^- \rightarrow \Upsilon(4S)$
1.68 $\pm$ 0.32 $\pm$ 0.16		<sup>1,3</sup> LEES	12O BABR	$e^+e^- \rightarrow \Upsilon(4S)$
1.8 $\pm$ 0.9 $\pm$ 0.1		<sup>4</sup> LEES	11I BABR	$e^+e^- \rightarrow \Upsilon(4S)$
1.26 $^{+0.28}_{-0.25}$ $\pm$ 0.05		<sup>1,5</sup> AUBERT	08AI BABR	$e^+e^- \rightarrow \Upsilon(4S)$
4.8 $\pm$ 2.2 $\pm$ 0.2		<sup>6</sup> AUBERT,BE	06M BABR	$e^+e^- \rightarrow \Upsilon(4S)$
1.12 $\pm$ 0.12 $^{+0.30}_{-0.20}$		<sup>1</sup> GARMASH	06 BELL	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

<2.7	95	<sup>7</sup> AAIJ	13S LHCb	$pp$ at 7 TeV
<5	90	<sup>1,8</sup> WICHT	08 BELL	$e^+e^- \rightarrow \Upsilon(4S)$
<1.8	90	<sup>9</sup> AUBERT	06E BABR	$e^+e^- \rightarrow \Upsilon(4S)$
1.84 $\pm$ 0.32 $\pm$ 0.31		<sup>1,10</sup> AUBERT	06O BABR	Repl. by LEES 12O
<8.9	90	<sup>1</sup> AUBERT	05K BABR	$e^+e^- \rightarrow \Upsilon(4S)$
1.39 $\pm$ 0.49 $\pm$ 0.11		<sup>11</sup> AUBERT,B	05N BABR	Repl. by AUBERT 08AI
1.96 $\pm$ 0.35 $^{+2.00}_{-0.42}$		<sup>1</sup> GARMASH	05 BELL	Repl. by GARMASH 06
2.7 $\pm$ 0.7		<sup>12</sup> AUBERT	04T BABR	Repl. by AUBERT,B 04P
3.0 $\pm$ 0.8 $\pm$ 0.3		<sup>13</sup> AUBERT,B	04P BABR	Repl. by AUBERT,B 05N
6.0 $^{+2.1}_{-1.8}$ $\pm$ 1.1		<sup>14</sup> ABE	02B BELL	Repl. by GARMASH 05
<4.8	90	<sup>15</sup> EDWARDS	01 CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> Measured in the  $B^+ \rightarrow K^+ K^- K^+$  decay.

<sup>3</sup> Measured in the  $B^+ \rightarrow K^+ K_S^0 K_S^0$  decay.

<sup>4</sup> LEES 11I reports  $[\Gamma(B^+ \rightarrow \chi_{c0}(1P)K^+)/\Gamma_{\text{total}}] \times [B(\chi_{c0}(1P) \rightarrow \pi\pi)] = (1.53 \pm 0.66 \pm 0.27) \times 10^{-6}$  which we divide by our best value  $B(\chi_{c0}(1P) \rightarrow \pi\pi) = (8.33 \pm 0.35) \times 10^{-3}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>5</sup> AUBERT 08AI reports  $(0.70 \pm 0.10^{+0.12}_{-0.10}) \times 10^{-6}$  for  $B(B^+ \rightarrow \chi_{c0}K^+) \times B(\chi_{c0} \rightarrow \pi^+\pi^-)$ . We compute  $B(B^+ \rightarrow \chi_{c0}K^+)$  using the PDG value  $B(\chi_{c0} \rightarrow \pi\pi) = (8.33 \pm$

- 0.35)  $\times 10^{-3}$  and 2/3 for the  $\pi^+\pi^-$  fraction. Our first error is their experiment's error and the second error is systematic error from using our best value.
- <sup>6</sup> AUBERT, BE 06M reports  $[\Gamma(B^+ \rightarrow \chi_{c0}(1P)K^+)/\Gamma_{\text{total}}] \times [B(\chi_{c0}(1P) \rightarrow \gamma J/\psi(1S))] = (6.1 \pm 2.6 \pm 1.1) \times 10^{-6}$  which we divide by our best value  $B(\chi_{c0}(1P) \rightarrow \gamma J/\psi(1S)) = (1.27 \pm 0.06) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value. The significance of the observed signal is 2.4  $\sigma$ .
- <sup>7</sup> AAIJ 13S reports  $[\Gamma(B^+ \rightarrow \chi_{c0}(1P)K^+)/\Gamma_{\text{total}}] \times [B(\chi_{c0}(1P) \rightarrow p\bar{p})] < 6 \times 10^{-8}$  which we divide by our best value  $B(\chi_{c0}(1P) \rightarrow p\bar{p}) = 2.25 \times 10^{-4}$ .
- <sup>8</sup> WICHT 08 reports  $[\Gamma(B^+ \rightarrow \chi_{c0}(1P)K^+)/\Gamma_{\text{total}}] \times [B(\chi_{c0}(1P) \rightarrow \gamma\gamma)] < 0.11 \times 10^{-6}$  which we divide by our best value  $B(\chi_{c0}(1P) \rightarrow \gamma\gamma) = 2.23 \times 10^{-4}$ .
- <sup>9</sup> Perform measurements of absolute branching fractions using a missing mass technique.
- <sup>10</sup> Measured in the  $B^+ \rightarrow K^+K^-K^+$  decay.
- <sup>11</sup> AUBERT, B 05N reports  $(0.66 \pm 0.22 \pm 0.08) \times 10^{-6}$  for  $B(B^+ \rightarrow \chi_c^0 K^+) \times B(\chi_c^0 \rightarrow \pi^+\pi^-)$ . We compute  $B(B^+ \rightarrow \chi_c^0 K^+)$  using the PDG value  $B(\chi_c^0 \rightarrow \pi^+\pi^-) = (7.1 \pm 0.6) \times 10^{-3}$  and 2/3 for the  $\pi^+\pi^-$  fraction.
- <sup>12</sup> The measurement performed using decay channels  $\chi_{c0} \rightarrow \pi^+\pi^-$  and  $\chi_{c0} \rightarrow K^+K^-$ . The ratio of the branching ratios for these channels is found to be consistent with world average.
- <sup>13</sup> AUBERT 04P reports  $B(B^+ \rightarrow \chi_{c0} K^+) \times B(\chi_{c0} \rightarrow \pi^+\pi^-) = (1.5 \pm 0.4 \pm 0.1) \times 10^{-6}$  and used PDG value of  $B(\chi_{c0} \rightarrow \pi\pi) = (7.4 \pm 0.8) \times 10^{-3}$  and Clebsh-Gordan coefficient to compute  $B(B^{\pm} \rightarrow \chi_{c0} K^+)$ .
- <sup>14</sup> ABE 02B measures the ratio of  $B(B^+ \rightarrow \chi_{c0} K^+)/B(B^+ \rightarrow J/\psi(1S)K^+) = 0.60 + 0.21 - 0.18 \pm 0.05 \pm 0.08$ , where the third error is due to the uncertainty in the  $B(\chi_{c0} \rightarrow \pi^+\pi^-)$ , and uses  $B(B^+ \rightarrow J/\psi(1S)K^+) = (10.0 \pm 1.0) \times 10^{-4}$  to obtain the result.
- <sup>15</sup> EDWARDS 01 assumes equal production of  $B^0$  and  $B^+$  at the  $\Upsilon(4S)$ . The correlated uncertainties (28.3)% from  $B(J/\psi(1S) \rightarrow \gamma\eta_c)$  in those modes have been accounted for.

**$\Gamma(\chi_{c0} K^*(892)^+)/\Gamma_{\text{total}}$   $\Gamma_{295}/\Gamma$**

VALUE (units $10^{-4}$ )	CL%	DOCUMENT ID	TECN	COMMENT
< 2.1	90	<sup>1</sup> AUBERT	08BD BABR	$e^+e^- \rightarrow \Upsilon(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
< 28.6	90	<sup>1</sup> AUBERT	05K BABR	Repl. by AUBERT 08BD
<sup>1</sup> Assumes equal production of $B^+$ and $B^0$ at the $\Upsilon(4S)$ .				

**$\Gamma(\chi_{c2} \pi^+, \chi_{c2} \rightarrow \pi^+\pi^-)/\Gamma_{\text{total}}$   $\Gamma_{296}/\Gamma$**

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
< 0.1	90	<sup>1</sup> AUBERT	09L BABR	$e^+e^- \rightarrow \Upsilon(4S)$
<sup>1</sup> Assumes equal production of $B^+$ and $B^0$ at the $\Upsilon(4S)$ .				

**$\Gamma(\chi_{c2} K^+)/\Gamma_{\text{total}}$   $\Gamma_{297}/\Gamma$**

VALUE (units $10^{-5}$ )	CL%	DOCUMENT ID	TECN	COMMENT
$1.11^{+0.36}_{-0.34} \pm 0.09$		<sup>1</sup> BHARDWAJ	11 BELL	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

< 1.8	90	<sup>2</sup> AUBERT	09B	BABR	$e^+e^- \rightarrow \Upsilon(4S)$
< 20	90	<sup>3</sup> AUBERT	06E	BABR	$e^+e^- \rightarrow \Upsilon(4S)$
< 2.9	90	<sup>1</sup> SONI	06	BELL	Repl. by BHARDWAJ 11
< 3.0	90	<sup>1</sup> AUBERT	05K	BABR	Repl. by AUBERT 06E

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> Uses  $\chi_{c1,2} \rightarrow J/\psi\gamma$ . Assumes  $B(\Upsilon(4S) \rightarrow B^+B^-) = (51.6 \pm 0.6)\%$  and  $B(\Upsilon(4S) \rightarrow B^0\bar{B}^0) = (48.4 \pm 0.6)\%$ .

<sup>3</sup> Perform measurements of absolute branching fractions using a missing mass technique.

$$\Gamma(B^+ \rightarrow \chi_{c2} K^+)/\Gamma_{\text{total}} \times \Gamma(\chi_{c2}(1P) \rightarrow \gamma\gamma)/\Gamma_{\text{total}} \quad \Gamma_{297}/\Gamma \times \Gamma_{79}^{\chi_{c2}(1P)}/\Gamma_{\chi_{c2}(1P)}$$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;0.09</b>	90	<sup>1</sup> WICHT	08	BELL $e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$$\Gamma(\chi_{c2} K^*(892)^+)/\Gamma_{\text{total}} \quad \Gamma_{298}/\Gamma$$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;12 <math>\times 10^{-5}</math></b>	90	<sup>1</sup> AUBERT	09B	BABR $e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

< $12.7 \times 10^{-5}$	90	<sup>2</sup> SONI	06	BELL	$e^+e^- \rightarrow \Upsilon(4S)$
< $1.2 \times 10^{-5}$	90	<sup>2</sup> AUBERT	05K	BABR	Repl. by AUBERT 09B

<sup>1</sup> Uses  $\chi_{c1,2} \rightarrow J/\psi\gamma$ . Assumes  $B(\Upsilon(4S) \rightarrow B^+B^-) = (51.6 \pm 0.6)\%$  and  $B(\Upsilon(4S) \rightarrow B^0\bar{B}^0) = (48.4 \pm 0.6)\%$ .

<sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$$\Gamma(\chi_{c1}(1P)\pi^+)/\Gamma_{\text{total}} \quad \Gamma_{299}/\Gamma$$

VALUE (units $10^{-5}$ )	DOCUMENT ID	TECN	COMMENT
<b><math>2.2 \pm 0.4 \pm 0.3</math></b>	<sup>1</sup> KUMAR	06	BELL $e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$$\Gamma(\chi_{c1}(1P)K^+)/\Gamma_{\text{total}} \quad \Gamma_{300}/\Gamma$$

VALUE (units $10^{-4}$ )	EVTS	DOCUMENT ID	TECN	COMMENT
<b><math>4.79 \pm 0.23</math> OUR AVERAGE</b>				
$4.94 \pm 0.11 \pm 0.33$		<sup>1</sup> BHARDWAJ	11	BELL $e^+e^- \rightarrow \Upsilon(4S)$
$4.5 \pm 0.1 \pm 0.3$		<sup>2</sup> AUBERT	09B	BABR $e^+e^- \rightarrow \Upsilon(4S)$
$8.1 \pm 1.4 \pm 0.7$		<sup>3</sup> AUBERT	06E	BABR $e^+e^- \rightarrow \Upsilon(4S)$
$15.5 \pm 5.4 \pm 2.0$		<sup>4</sup> ACOSTA	02F	CDF $p\bar{p}$ 1.8 TeV

• • • We do not use the following data for averages, fits, limits, etc. • • •

$5.2 \pm 0.4 \pm 0.2$		<sup>5</sup> AUBERT, BE	06M	BABR	Repl. by AUBERT 09B
$4.49 \pm 0.19 \pm 0.53$		<sup>1</sup> SONI	06	BELL	Repl. by BHARDWAJ 11
$5.79 \pm 0.26 \pm 0.65$		<sup>1</sup> AUBERT	05J	BABR	Repl. by AUBERT, BE 06M
$6.0 \pm 0.9 \pm 0.2$		<sup>6</sup> AUBERT	02	BABR	Repl. by AUBERT 05J
$9.7 \pm 4.0 \pm 0.9$	6	<sup>1</sup> ALAM	94	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
$19 \pm 13 \pm 6$		<sup>7</sup> ALBRECHT	92E	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

- <sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .  
<sup>2</sup> Uses  $\chi_{c1,2} \rightarrow J/\psi\gamma$ . Assumes  $B(\Upsilon(4S) \rightarrow B^+ B^-) = (51.6 \pm 0.6)\%$  and  $B(\Upsilon(4S) \rightarrow B^0 \bar{B}^0) = (48.4 \pm 0.6)\%$ .  
<sup>3</sup> Perform measurements of absolute branching fractions using a missing mass technique.  
<sup>4</sup> ACOSTA 02F uses as reference of  $B(B \rightarrow J/\psi(1S) K^+) = (10.1 \pm 0.6) \times 10^{-4}$ . The second error includes the systematic error and the uncertainties of the branching ratio.  
<sup>5</sup> AUBERT, BE 06M reports  $[\Gamma(B^+ \rightarrow \chi_{c1}(1P) K^+)/\Gamma_{\text{total}}] \times [B(\chi_{c1}(1P) \rightarrow \gamma J/\psi(1S))]$   $= (1.76 \pm 0.07 \pm 0.12) \times 10^{-4}$  which we divide by our best value  $B(\chi_{c1}(1P) \rightarrow \gamma J/\psi(1S)) = (33.9 \pm 1.2) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.  
<sup>6</sup> AUBERT 02 reports  $(7.5 \pm 0.9 \pm 0.8) \times 10^{-4}$  from a measurement of  $[\Gamma(B^+ \rightarrow \chi_{c1}(1P) K^+)/\Gamma_{\text{total}}] \times [B(\chi_{c1}(1P) \rightarrow \gamma J/\psi(1S))]$  assuming  $B(\chi_{c1}(1P) \rightarrow \gamma J/\psi(1S)) = 0.273 \pm 0.016$ , which we rescale to our best value  $B(\chi_{c1}(1P) \rightarrow \gamma J/\psi(1S)) = (33.9 \pm 1.2) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .  
<sup>7</sup> ALBRECHT 92E assumes no  $\chi_{c2}(1P)$  production and  $B(\Upsilon(4S) \rightarrow B^+ B^-) = 50\%$ .

$\Gamma(\chi_{c1}(1P) K^+)/\Gamma(J/\psi(1S) K^+)$   $\Gamma_{300}/\Gamma_{255}$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.60±0.07±0.02</b>	<sup>1</sup> AUBERT 02	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

- <sup>1</sup> AUBERT 02 reports  $0.75 \pm 0.08 \pm 0.05$  from a measurement of  $[\Gamma(B^+ \rightarrow \chi_{c1}(1P) K^+)/\Gamma(B^+ \rightarrow J/\psi(1S) K^+)] \times [B(\chi_{c1}(1P) \rightarrow \gamma J/\psi(1S))]$  assuming  $B(\chi_{c1}(1P) \rightarrow \gamma J/\psi(1S)) = 0.273 \pm 0.016$ , which we rescale to our best value  $B(\chi_{c1}(1P) \rightarrow \gamma J/\psi(1S)) = (33.9 \pm 1.2) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\chi_{c1}(1P) \pi^+)/\Gamma(\chi_{c1}(1P) K^+)$   $\Gamma_{299}/\Gamma_{300}$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.043±0.008±0.003</b>	<sup>1</sup> KUMAR 06	BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

- <sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\chi_{c1}(1P) K^0 \pi^+)/\Gamma(J/\psi(1S) K^0 \pi^+)$   $\Gamma_{301}/\Gamma_{256}$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.508±0.030±0.018</b>	<sup>1</sup> LEES 12B	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

- <sup>1</sup> LEES 12B reports  $0.501 \pm 0.024 \pm 0.028$  from a measurement of  $[\Gamma(B^+ \rightarrow \chi_{c1}(1P) K^0 \pi^+)/\Gamma(B^+ \rightarrow J/\psi(1S) K^0 \pi^+)] \times [B(\chi_{c1}(1P) \rightarrow \gamma J/\psi(1S))]$  assuming  $B(\chi_{c1}(1P) \rightarrow \gamma J/\psi(1S)) = (34.4 \pm 1.5) \times 10^{-2}$ , which we rescale to our best value  $B(\chi_{c1}(1P) \rightarrow \gamma J/\psi(1S)) = (33.9 \pm 1.2) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\chi_{c1}(1P) K^*(892)^+)/\Gamma_{\text{total}}$   $\Gamma_{302}/\Gamma$

VALUE (units $10^{-4}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>3.0 ± 0.6 OUR AVERAGE</b>		Error includes scale factor of 1.1.		
2.6 ± 0.5 ± 0.4		<sup>1</sup> AUBERT 09B	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
4.05 ± 0.59 ± 0.95		<sup>2</sup> SONI 06	BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
2.94 ± 0.95 ± 0.98		<sup>2</sup> AUBERT 05J	BABR	Repl. by AUBERT 09B
<21	90	<sup>2</sup> ALAM 94	CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Uses  $\chi_{c1,2} \rightarrow J/\psi\gamma$ . Assumes  $B(\Upsilon(4S) \rightarrow B^+ B^-) = (51.6 \pm 0.6)\%$  and  $B(\Upsilon(4S) \rightarrow B^0 \bar{B}^0) = (48.4 \pm 0.6)\%$ .

<sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\chi_{c1}(1P)K^*(892)^+)/\Gamma(\chi_{c1}(1P)K^+)$   $\Gamma_{302}/\Gamma_{300}$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.51 ± 0.17 ± 0.16</b>	AUBERT	05J	BABR $e^+ e^- \rightarrow \Upsilon(4S)$

$\Gamma(h_c(1P)K^+)/\Gamma_{total}$   $\Gamma_{303}/\Gamma$

VALUE (units $10^{-5}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;3.8</b>	90	<sup>1</sup> FANG	06	BELL $e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$  and  $B(h_c \rightarrow \eta_c \gamma) = 50\%$ .

$\Gamma(h_c(1P)K^+, h_c \rightarrow p\bar{p})/\Gamma_{total}$   $\Gamma_{304}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;6.4 × 10<sup>-8</sup></b>	95	<sup>1</sup> AAIJ	13S	LHCB $pp$ at 7 TeV

<sup>1</sup> Measured relative to  $B^+ \rightarrow J/\psi K^+$  decay with charmonia reconstructed in  $p\bar{p}$  final state and using  $B(B^+ \rightarrow J/\psi K^+) = (1.013 \pm 0.034) \times 10^{-3}$  and  $B(J/\psi \rightarrow p\bar{p}) = (2.17 \pm 0.07) \times 10^{-3}$ .

$\Gamma(K^0\pi^+)/\Gamma_{total}$   $\Gamma_{305}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>23.7 ± 0.8 OUR FIT</b>				
<b>23.8 ± 0.7 OUR AVERAGE</b>				
23.97 ± 0.53 ± 0.71		<sup>1</sup> DUH	13	BELL $e^+ e^- \rightarrow \Upsilon(4S)$
23.9 ± 1.1 ± 1.0		<sup>1</sup> AUBERT, BE	06C	BABR $e^+ e^- \rightarrow \Upsilon(4S)$
18.8 + 3.7 + 2.1 - 3.3 - 1.8		<sup>1</sup> BORNHEIM	03	CLE2 $e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

22.8 + 0.8 - 0.7 ± 1.3		<sup>1</sup> LIN	07	BELL	Repl. by DUH 13
26.0 ± 1.3 ± 1.0		<sup>1</sup> AUBERT, BE	05E	BABR	Repl. by AUBERT, BE 06C
22.3 ± 1.7 ± 1.1		<sup>1</sup> AUBERT	04M	BABR	Repl. by AUBERT, BE 05E
22.0 ± 1.9 ± 1.1		<sup>1</sup> CHAO	04	BELL	Repl. by LIN 07
19.4 + 3.1 - 3.0 ± 1.6		<sup>1</sup> CASEY	02	BELL	Repl. by CHAO 04
13.7 + 5.7 + 1.9 - 4.8 - 1.8		<sup>1</sup> ABE	01H	BELL	Repl. by CASEY 02
18.2 + 3.3 - 3.0 ± 2.0		<sup>1</sup> AUBERT	01E	BABR	Repl. by AUBERT 04M
18.2 + 4.6 - 4.0 ± 1.6		<sup>1</sup> CRONIN-HEN..00	CLE2		Repl. by BORNHEIM 03
23 + 11 - 10 ± 3.6		GODANG	98	CLE2	Repl. by CRONIN-HENNESSY 00
< 48	90	ASNER	96	CLE2	Repl. by GODANG 98
<190	90	ALBRECHT	91B	ARG	$e^+ e^- \rightarrow \Upsilon(4S)$
<100	90	<sup>2</sup> AVERY	89B	CLEO	$e^+ e^- \rightarrow \Upsilon(4S)$
<680	90	AVERY	87	CLEO	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> AVERY 89B reports  $< 9 \times 10^{-5}$  assuming the  $\Upsilon(4S)$  decays 43% to  $B^0 \bar{B}^0$ . We rescale to 50%.



$\Gamma(K^+ \pi^0)/\Gamma_{\text{total}}$   $\Gamma_{306}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>12.9 ± 0.5 OUR AVERAGE</b>				
12.62 ± 0.31 ± 0.56		<sup>1</sup> DUH	13 BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
13.6 ± 0.6 ± 0.7		<sup>1</sup> AUBERT	07BC BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
12.9 <sup>+2.4</sup> <sub>-2.2</sub> <sup>+1.2</sup> <sub>-1.1</sub>		<sup>1</sup> BORNHEIM	03 CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
12.4 ± 0.5 ± 0.6		<sup>1</sup> LIN	07A BELL	Repl. by DUH 13
12.0 ± 0.7 ± 0.6		<sup>1</sup> AUBERT	05L BABR	Repl. by AUBERT 07BC
12.0 ± 1.3 <sup>+1.3</sup> <sub>-0.9</sub>		<sup>1</sup> CHAO	04 BELL	Repl. by LIN 07A
12.8 <sup>+1.2</sup> <sub>-1.1</sub> ± 1.0		<sup>1</sup> AUBERT	03L BABR	Repl. by AUBERT 05L
13.0 <sup>+2.5</sup> <sub>-2.4</sub> ± 1.3		<sup>1</sup> CASEY	02 BELL	Repl. by CHAO 04
16.3 <sup>+3.5</sup> <sub>-3.3</sub> <sup>+1.6</sup> <sub>-1.8</sub>		<sup>1</sup> ABE	01H BELL	Repl. by CASEY 02
10.8 <sup>+2.1</sup> <sub>-1.9</sub> ± 1.0		<sup>1</sup> AUBERT	01E BABR	Repl. by AUBERT 03L
11.6 <sup>+3.0</sup> <sub>-2.7</sub> <sup>+1.4</sup> <sub>-1.3</sub>		<sup>1</sup> CRONIN-HEN..00	CLE2	Repl. by BORNHEIM 03
<16	90	GODANG	98 CLE2	Repl. by CRONIN-HENNESSY 00
<14	90	ASNER	96 CLE2	Repl. by GODANG 98
<sup>1</sup> Assumes equal production of $B^+$ and $B^0$ at the $\Upsilon(4S)$ .				

$\Gamma(K^+ \pi^0)/\Gamma(K^0 \pi^+)$   $\Gamma_{306}/\Gamma_{305}$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.54 ± 0.03 ± 0.04</b>			
	LIN	07A BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
2.38 <sup>+0.98</sup> <sub>-1.10</sub> <sup>+0.39</sup> <sub>-0.26</sub>	ABE	01H BELL	Repl. by LIN 07A

$\Gamma(\eta' K^+)/\Gamma_{\text{total}}$   $\Gamma_{307}/\Gamma$

VALUE (units $10^{-6}$ )	DOCUMENT ID	TECN	COMMENT
<b>70.6 ± 2.5 OUR AVERAGE</b>			
71.5 ± 1.3 ± 3.2	<sup>1</sup> AUBERT	09AV BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
63 <sup>+10</sup> <sub>-9</sub> ± 2	<sup>1,2</sup> WICHT	08 BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
69.2 ± 2.2 ± 3.7	<sup>1</sup> SCHUEMANN	06 BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
80 <sup>+10</sup> <sub>-9</sub> ± 7	<sup>1</sup> RICHICHI	00 CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
70.0 ± 1.5 ± 2.8	<sup>1</sup> AUBERT	07AE BABR	Repl. by AUBERT 09AV
68.9 ± 2.0 ± 3.2	<sup>1</sup> AUBERT	05M BABR	Repl. by AUBERT 07AE
76.9 ± 3.5 ± 4.4	<sup>1</sup> AUBERT	03W BABR	Repl. by AUBERT 05M
79 <sup>+12</sup> <sub>-11</sub> ± 9	<sup>1</sup> ABE	01M BELL	Repl. by SCHUEMANN 06
70 ± 8 ± 5	<sup>1</sup> AUBERT	01G BABR	Repl. by AUBERT 03W
65 <sup>+15</sup> <sub>-14</sub> ± 9	BEHRENS	98 CLE2	Repl. by RICHICHI 00

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> WICHT 08 reports  $[\Gamma(B^+ \rightarrow \eta' K^+)/\Gamma_{\text{total}}] \times [B(\eta'(958) \rightarrow \gamma\gamma)] = (1.40^{+0.16+0.15}_{-0.15-0.12}) \times 10^{-6}$  which we divide by our best value  $B(\eta'(958) \rightarrow \gamma\gamma) = (2.21 \pm 0.08) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

### $\Gamma(\eta' K^*(892)^+)/\Gamma_{\text{total}}$ $\Gamma_{308}/\Gamma$

<u>VALUE (units <math>10^{-6}</math>)</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>4.8^{+1.6}_{-1.4} \pm 0.8</math></b>		<sup>1</sup> DEL-AMO-SA..10A	BABR	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$4.9^{+1.9}_{-1.7} \pm 0.8$		<sup>1</sup> AUBERT	07E	BABR	Repl. by DEL-AMO-SANCHEZ 10A
< 2.9	90	<sup>1</sup> SCHUEMANN	07	BELL	$e^+e^- \rightarrow \Upsilon(4S)$
< 14	90	<sup>1</sup> AUBERT,B	04D	BABR	Repl. by AUBERT 07E
< 35	90	<sup>1</sup> RICHICHI	00	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
< 13	90	BEHRENS	98	CLE2	Repl. by RICHICHI 00

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

### $\Gamma(\eta' K_0^*(1430)^+)/\Gamma_{\text{total}}$ $\Gamma_{309}/\Gamma$

<u>VALUE (units <math>10^{-6}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>5.2 \pm 1.9 \pm 1.0</math></b>	<sup>1</sup> DEL-AMO-SA..10A	BABR	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

### $\Gamma(\eta' K_2^*(1430)^+)/\Gamma_{\text{total}}$ $\Gamma_{310}/\Gamma$

<u>VALUE (units <math>10^{-6}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>28.0^{+4.6}_{-4.3} \pm 2.6</math></b>	<sup>1</sup> DEL-AMO-SA..10A	BABR	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

### $\Gamma(\eta K^+)/\Gamma_{\text{total}}$ $\Gamma_{311}/\Gamma$

<u>VALUE (units <math>10^{-6}</math>)</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>2.4 \pm 0.4</math> OUR AVERAGE</b>		Error includes scale factor of 1.7.		
$2.12 \pm 0.23 \pm 0.11$		<sup>1</sup> HOI	12	BELL $e^+e^- \rightarrow \Upsilon(4S)$
$2.94^{+0.39}_{-0.34} \pm 0.21$		<sup>1</sup> AUBERT	09AV	BABR $e^+e^- \rightarrow \Upsilon(4S)$
$2.2^{+2.8}_{-2.2}$		<sup>1</sup> RICHICHI	00	CLE2 $e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$2.21^{+0.48}_{-0.42} \pm 0.01$		<sup>1,2</sup> WICHT	08	BELL	Repl. by HOI 12
$3.7 \pm 0.4 \pm 0.1$		<sup>1</sup> AUBERT	07AE	BABR	Repl. by AUBERT 09AV
$1.9 \pm 0.3^{+0.2}_{-0.1}$		<sup>1</sup> CHANG	07B	BELL	Repl. by HOI 12
$3.3 \pm 0.6 \pm 0.3$		<sup>1</sup> AUBERT,B	05K	BABR	Repl. by AUBERT 07AE
$2.1 \pm 0.6 \pm 0.2$		<sup>1</sup> CHANG	05A	BELL	Repl. by CHANG 07B
$3.4 \pm 0.8 \pm 0.2$		<sup>1</sup> AUBERT	04H	BABR	Repl. by AUBERT,B 05K
< 14	90	BEHRENS	98	CLE2	Repl. by RICHICHI 00

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> WICHT 08 reports  $[\Gamma(B^+ \rightarrow \eta K^+)/\Gamma_{\text{total}}] \times [B(\eta \rightarrow 2\gamma)] = (0.87^{+0.16+0.10}_{-0.15-0.07}) \times 10^{-6}$  which we divide by our best value  $B(\eta \rightarrow 2\gamma) = (39.41 \pm 0.20) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

**$\Gamma(\eta K^*(892)^+)/\Gamma_{\text{total}}$   $\Gamma_{312}/\Gamma$**

<u>VALUE (units <math>10^{-6}</math>)</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>19.3±1.6 OUR AVERAGE</b>				
$19.3^{+2.0}_{-1.9} \pm 1.5$		<sup>1</sup> WANG	07B BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
$18.9 \pm 1.8 \pm 1.3$		<sup>1</sup> AUBERT,B	06H BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
$26.4^{+9.6}_{-8.2} \pm 3.3$		<sup>1</sup> RICHICHI	00 CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$25.6 \pm 4.0 \pm 2.4$		<sup>1</sup> AUBERT,B	04D BABR	Repl. by AUBERT,B 06H
<30	90	BEHRENS	98 CLE2	Repl. by RICHICHI 00

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

**$\Gamma(\eta K_0^*(1430)^+)/\Gamma_{\text{total}}$   $\Gamma_{313}/\Gamma$**

<u>VALUE (units <math>10^{-6}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>18.2±2.6±2.6</b>	<sup>1</sup> AUBERT,B	06H BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

**$\Gamma(\eta K_2^*(1430)^+)/\Gamma_{\text{total}}$   $\Gamma_{314}/\Gamma$**

<u>VALUE (units <math>10^{-6}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>9.1±2.7±1.4</b>	<sup>1</sup> AUBERT,B	06H BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

**$\Gamma(\eta(1295) K^+ \times B(\eta(1295) \rightarrow \eta \pi \pi))/\Gamma_{\text{total}}$   $\Gamma_{315}/\Gamma$**

<u>VALUE (units <math>10^{-6}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>2.9^{+0.8}_{-0.7} \pm 0.2</math></b>	<sup>1</sup> AUBERT	08X BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

**$\Gamma(\eta(1405) K^+ \times B(\eta(1405) \rightarrow \eta \pi \pi))/\Gamma_{\text{total}}$   $\Gamma_{316}/\Gamma$**

<u>VALUE (units <math>10^{-6}</math>)</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>&lt;1.3</b>	90	<sup>1</sup> AUBERT	08X BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

**$\Gamma(\eta(1405) K^+ \times B(\eta(1405) \rightarrow K^* K))/\Gamma_{\text{total}}$   $\Gamma_{317}/\Gamma$**

<u>VALUE (units <math>10^{-6}</math>)</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>&lt;1.2</b>	90	<sup>1</sup> AUBERT	08X BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

**$\Gamma(\eta(1475)K^+ \times B(\eta(1475) \rightarrow K^*K))/\Gamma_{\text{total}}$   $\Gamma_{318}/\Gamma$**

<u>VALUE (units <math>10^{-6}</math>)</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$13.8^{+1.8+1.0}_{-1.7-0.6}$		<sup>1</sup> AUBERT	08X BABR	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

**$\Gamma(f_1(1285)K^+)/\Gamma_{\text{total}}$   $\Gamma_{319}/\Gamma$**

<u>VALUE (units <math>10^{-6}</math>)</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$<2.0$	90	<sup>1</sup> AUBERT	08X BABR	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

**$\Gamma(f_1(1420)K^+ \times B(f_1(1420) \rightarrow \eta\pi\pi))/\Gamma_{\text{total}}$   $\Gamma_{320}/\Gamma$**

<u>VALUE (units <math>10^{-6}</math>)</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$<2.9$	90	<sup>1</sup> AUBERT	08X BABR	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

**$\Gamma(f_1(1420)K^+ \times B(f_1(1420) \rightarrow K^*K))/\Gamma_{\text{total}}$   $\Gamma_{321}/\Gamma$**

<u>VALUE (units <math>10^{-6}</math>)</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$<4.1$	90	<sup>1</sup> AUBERT	08X BABR	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

**$\Gamma(\phi(1680)K^+ \times B(\phi(1680) \rightarrow K^*K))/\Gamma_{\text{total}}$   $\Gamma_{322}/\Gamma$**

<u>VALUE (units <math>10^{-6}</math>)</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$<3.4$	90	<sup>1</sup> AUBERT	08X BABR	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

**$\Gamma(f_0(1500)K^+)/\Gamma_{\text{total}}$   $\Gamma_{323}/\Gamma$**

<u>VALUE (units <math>10^{-6}</math>)</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>3.7 \pm 2.2</math> OUR AVERAGE</b>				
$17 \pm 4 \pm 12$		<sup>1</sup> LEES	120 BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$20 \pm 10 \pm 27$		<sup>2</sup> LEES	120 BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$3.1^{+2.2}_{-2.3} \pm 0.2$		<sup>3,4</sup> AUBERT	08AI BABR	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$<19$	90	<sup>4,5</sup> AUBERT,B	05N BABR	Repl. by AUBERT 08AI
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<sup>1</sup> Measured in the  $B^+ \rightarrow K^+K^-K^+$  decay.

<sup>2</sup> Measured in the  $B^+ \rightarrow K^+K_S^0K_S^0$  decay.

<sup>3</sup> AUBERT 08AI reports  $B(B^+ \rightarrow f_0(1500)K^+) \cdot B(f_0(1500) \rightarrow \pi^+\pi^-) = (0.73 \pm 0.21^{+0.47}_{-0.48}) \times 10^{-6}$ . We divide this result by our best value of  $B(f_0(1500) \rightarrow \pi\pi) = (34.9 \pm 2.3) \times 10^{-2}$  multiplied by 2/3 to account for the  $\pi^+\pi^-$  fraction. Our first quoted uncertainty is the combined experiment's uncertainty and our second is the systematic uncertainty from using out best value.

<sup>4</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>5</sup> AUBERT,B 05N reports  $B(B^+ \rightarrow f_0(1500)K^+) \cdot B(f_0(1500) \rightarrow \pi^+\pi^-) < 4.4 \times 10^{-6}$ . We divide this result by our best value of  $B(f_0(1500) \rightarrow \pi\pi) = (34.9 \pm 2.3) \times 10^{-2}$  multiplied by 2/3 to account for the  $\pi^+\pi^-$  fraction. Our first quoted uncertainty is the combined experiment's uncertainty and our second is the systematic uncertainty from using out best value.

$\Gamma(\omega K^+)/\Gamma_{\text{total}}$   $\Gamma_{324}/\Gamma$

<u>VALUE (units <math>10^{-6}</math>)</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>6.5±0.4 OUR AVERAGE</b>				
6.8±0.4±0.4		<sup>1</sup> CHOBANOVA 14	BELL	$e^+e^- \rightarrow \Upsilon(4S)$
6.3±0.5±0.3		<sup>1</sup> AUBERT 07AE	BABR	$e^+e^- \rightarrow \Upsilon(4S)$
3.2 <sup>+2.4</sup> <sub>-1.9</sub> ±0.8		<sup>1</sup> JESSOP 00	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

6.1±0.6±0.4		<sup>1</sup> AUBERT,B 06E	BABR	AUBERT 07AE
8.1±0.6±0.6		<sup>1</sup> JEN 06	BELL	Repl. by CHOBANOVA 14
4.8±0.8±0.4		<sup>1</sup> AUBERT 04H	BABR	Repl. by AUBERT,B 06E
6.5 <sup>+1.3</sup> <sub>-1.2</sub> ±0.6		<sup>1</sup> WANG 04A	BELL	Repl. by JEN 06
9.2 <sup>+2.6</sup> <sub>-2.3</sub> ±1.0		<sup>1</sup> LU 02	BELL	Repl. by WANG 04A
<4	90	<sup>1</sup> AUBERT 01G	BABR	$e^+e^- \rightarrow \Upsilon(4S)$
1.5 <sup>+7</sup> <sub>-6</sub> ±2		<sup>1</sup> BERGFELD 98	CLE2	Repl. by JESSOP 00

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\omega K^*(892)^+)/\Gamma_{\text{total}}$   $\Gamma_{325}/\Gamma$

<u>VALUE (units <math>10^{-6}</math>)</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>&lt; 7.4</b>	90	<sup>1</sup> AUBERT 09H	BABR	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

< 3.4	90	<sup>1</sup> AUBERT,B 06T	BABR	Repl. by AUBERT 09H
< 7.4	90	<sup>1</sup> AUBERT 05O	BABR	Repl. by AUBERT,B 06T
<87	90	<sup>1</sup> BERGFELD 98	CLE2	

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\omega (K\pi)_0^{*+})/\Gamma_{\text{total}}$   $\Gamma_{326}/\Gamma$

$(K\pi)_0^{*+}$  is the total S-wave composed of  $K_0^*(1430)$  and nonresonant that are described using LASS shape.

<u>VALUE (units <math>10^{-6}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>27.5±3.0±2.6</b>	<sup>1</sup> AUBERT 09H	BABR	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\omega K_0^*(1430)^+)/\Gamma_{\text{total}}$   $\Gamma_{327}/\Gamma$

<u>VALUE (units <math>10^{-6}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>24.0±2.6±4.4</b>	<sup>1</sup> AUBERT 09H	BABR	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\omega K_2^*(1430)^+)/\Gamma_{\text{total}}$   $\Gamma_{328}/\Gamma$

<u>VALUE (units <math>10^{-6}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>21.5±3.6±2.4</b>	<sup>1</sup> AUBERT 09H	BABR	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(a_0(980)^0 K^+ \times B(a_0(980)^0 \rightarrow \eta\pi^0))/\Gamma_{\text{total}}$   $\Gamma_{330}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<2.5	90	<sup>1</sup> AUBERT,BE 04	BABR	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of charged and neutral  $B$  mesons from  $\Upsilon(4S)$  decays.

$\Gamma(a_0(980)^+ K^0 \times B(a_0(980)^+ \rightarrow \eta\pi^+))/\Gamma_{\text{total}}$   $\Gamma_{329}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<3.9	90	<sup>1</sup> AUBERT,BE 04	BABR	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of charged and neutral  $B$  mesons from  $\Upsilon(4S)$  decays.

$\Gamma(K^*(892)^0 \pi^+)/\Gamma_{\text{total}}$   $\Gamma_{331}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>10.1 ± 0.9 OUR AVERAGE</b>				
10.8 ± 0.6 <sup>+1.2</sup> / <sub>-1.4</sub>		<sup>1</sup> AUBERT 08AI	BABR	$e^+e^- \rightarrow \Upsilon(4S)$
9.67 ± 0.64 <sup>+0.81</sup> / <sub>-0.89</sub>		<sup>1</sup> GARMASH 06	BELL	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

13.5 ± 1.2 <sup>+0.8</sup> / <sub>-0.9</sub>		<sup>1</sup> AUBERT,B 05N	BABR	Repl. by AUBERT 08AI
9.8 ± 0.9 <sup>+1.1</sup> / <sub>-1.2</sub>		<sup>1</sup> GARMASH 05	BELL	Repl. by GARMASH 06
15.5 ± 1.8 <sup>+1.5</sup> / <sub>-4.0</sub>		<sup>1,2</sup> AUBERT,B 04P	BABR	Repl. by AUBERT,B 05N
19.4 <sup>+4.2</sup> / <sub>-3.9</sub> <sup>+4.1</sup> / <sub>-7.1</sub>		<sup>3</sup> GARMASH 02	BELL	Repl. by GARMASH 05
<119	90	<sup>4</sup> ABE 00C	SLD	$e^+e^- \rightarrow Z$
< 16	90	<sup>1</sup> JESSOP 00	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
<390	90	<sup>5</sup> ADAM 96D	DLPH	$e^+e^- \rightarrow Z$
< 41	90	ASNER 96	CLE2	Repl. by JESSOP 00
<480	90	<sup>5</sup> ABREU 95N	DLPH	Sup. by ADAM 96D
<170	90	ALBRECHT 91B	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
<150	90	<sup>6</sup> AVERY 89B	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
<260	90	AVERY 87	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> AUBERT 04P also report a branching ratio for  $B^+ \rightarrow$  "higher  $K^*$  resonances"  $\pi^+$ ,  $K^* \rightarrow K^+\pi^-$ ,  $(25.1 \pm 2.0^{+11.0}_{-5.7}) \times 10^{-6}$ .

<sup>3</sup> Uses a reference decay mode  $B^+ \rightarrow \bar{D}^0 \pi^+$  and  $\bar{D}^0 \rightarrow K^+\pi^-$  with  $B(B^+ \rightarrow \bar{D}^0 \pi^+) \cdot B(\bar{D}^0 \rightarrow K^+\pi^-) = (20.3 \pm 2.0) \times 10^{-5}$ .

<sup>4</sup> ABE 00C assumes  $B(Z \rightarrow b\bar{b}) = (21.7 \pm 0.1)\%$  and the  $B$  fractions  $f_{B^0} = f_{B^+} = (39.7^{+1.8}_{-2.2})\%$  and  $f_{B_s} = (10.5^{+1.8}_{-2.2})\%$ .

<sup>5</sup> Assumes a  $B^0$ ,  $B^-$  production fraction of 0.39 and a  $B_s$  production fraction of 0.12.

<sup>6</sup> AVERY 89B reports  $< 1.3 \times 10^{-4}$  assuming the  $\Upsilon(4S)$  decays 43% to  $B^0 \bar{B}^0$ . We rescale to 50%.

$\Gamma(K^*(892)^+\pi^0)/\Gamma_{\text{total}}$   $\Gamma_{332}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b><math>8.2 \pm 1.5 \pm 1.1</math></b>		<sup>1</sup> LEES	11I BABR	$e^+e^- \rightarrow \Upsilon(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
$6.9 \pm 2.0 \pm 1.3$		<sup>1</sup> AUBERT	05X BABR	Repl. by LEES 11I
<31	90	<sup>1</sup> JESSOP	00 CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
<99	90	ASNER	96 CLE2	Repl. by JESSOP 00
<sup>1</sup> Assumes equal production of $B^+$ and $B^0$ at the $\Upsilon(4S)$ .				

$\Gamma(K^+\pi^-\pi^+)/\Gamma_{\text{total}}$   $\Gamma_{333}/\Gamma$

VALUE (units $10^{-6}$ )	DOCUMENT ID	TECN	COMMENT
<b><math>51.0 \pm 2.9</math> OUR AVERAGE</b>			
$54.4 \pm 1.1 \pm 4.6$	<sup>1</sup> AUBERT	08AI BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$48.8 \pm 1.1 \pm 3.6$	<sup>1</sup> GARMASH	06 BELL	$e^+e^- \rightarrow \Upsilon(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
$64.1 \pm 2.4 \pm 4.0$	<sup>1</sup> AUBERT,B	05N BABR	Repl. by AUBERT 08AI
$46.6 \pm 2.1 \pm 4.3$	<sup>1</sup> GARMASH	05 BELL	Repl. by GARMASH 06
$53.6 \pm 3.1 \pm 5.1$	<sup>1</sup> GARMASH	04 BELL	Repl. by GARMASH 05
$59.1 \pm 3.8 \pm 3.2$	<sup>2</sup> AUBERT	03M BABR	Repl. by AUBERT,B 05N
$55.6 \pm 5.8 \pm 7.7$	<sup>3</sup> GARMASH	02 BELL	Repl. by GARMASH 04
<sup>1</sup> Assumes equal production of $B^+$ and $B^0$ at the $\Upsilon(4S)$ .			
<sup>2</sup> Assumes equal production of $B^0$ and $B^+$ at the $\Upsilon(4S)$ ; charm and charmonium contributions are subtracted, otherwise no assumptions about intermediate resonances.			
<sup>3</sup> Uses a reference decay mode $B^+ \rightarrow \bar{D}^0\pi^+$ and $\bar{D}^0 \rightarrow K^+\pi^-$ with $B(B^+ \rightarrow \bar{D}^0\pi^+) \cdot B(\bar{D}^0 \rightarrow K^+\pi^-) = (20.3 \pm 2.0) \times 10^{-5}$ .			

$\Gamma(K^+\pi^-\pi^+ \text{ nonresonant})/\Gamma_{\text{total}}$   $\Gamma_{334}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b><math>16.3^{+2.1}_{-1.5}</math> OUR AVERAGE</b>				
$9.3 \pm 1.0^{+6.9}_{-1.7}$		<sup>1,2</sup> AUBERT	08AI BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$16.9 \pm 1.3^{+1.7}_{-1.6}$		<sup>1</sup> GARMASH	06 BELL	$e^+e^- \rightarrow \Upsilon(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
$2.9 \pm 0.6^{+0.8}_{-0.5}$		<sup>1</sup> AUBERT,B	05N BABR	Repl. by AUBERT 08AI
$17.3 \pm 1.7^{+17.2}_{-8.0}$		<sup>1</sup> GARMASH	05 BELL	Repl. by GARMASH 06
< 17	90	<sup>1</sup> AUBERT,B	04P BABR	Repl. by AUBERT,B 05N
<330	90	<sup>3</sup> ADAM	96D DLPH	$e^+e^- \rightarrow Z$
< 28	90	BERGFELD	96B CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
<400	90	<sup>3</sup> ABREU	95N DLPH	Sup. by ADAM 96D
<330	90	ALBRECHT	91E ARG	$e^+e^- \rightarrow \Upsilon(4S)$
<190	90	<sup>4</sup> AVERY	89B CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
<sup>1</sup> Assumes equal production of $B^+$ and $B^0$ at the $\Upsilon(4S)$ .				
<sup>2</sup> Calculate the total nonresonant contribution by combining the S-wave composed of $K_0^*(1430)$ and nonresonant that are described using LASS shape.				
<sup>3</sup> Assumes a $B^0, B^-$ production fraction of 0.39 and a $B_S$ production fraction of 0.12.				
<sup>4</sup> AVERY 89B reports $< 1.7 \times 10^{-4}$ assuming the $\Upsilon(4S)$ decays 43% to $B^0\bar{B}^0$ . We rescale to 50%.				

$$\Gamma(\omega(782)K^+)/\Gamma_{\text{total}} \qquad \Gamma_{335}/\Gamma$$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>5.9<sup>+8.8+0.5</sup><sub>-9.0-0.4</sub></b>		1,2 AUBERT	08AI BABR	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> AUBERT 08AI reports  $[\Gamma(B^+ \rightarrow \omega(782)K^+)/\Gamma_{\text{total}}] \times [B(\omega(782) \rightarrow \pi^+\pi^-)] = (0.09 \pm 0.13^{+0.036}_{-0.045}) \times 10^{-6}$  which we divide by our best value  $B(\omega(782) \rightarrow \pi^+\pi^-) = (1.53^{+0.11}_{-0.13}) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

$$\Gamma(K^+ f_0(980) \times B(f_0(980) \rightarrow \pi^+\pi^-))/\Gamma_{\text{total}} \qquad \Gamma_{336}/\Gamma$$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>9.4<sup>+1.0</sup><sub>-1.2</sub></b>		<b>OUR AVERAGE</b>		

10.3 $\pm 0.5$ <sup>+2.0</sup> <sub>-1.4</sub>		1 AUBERT	08AI BABR	$e^+e^- \rightarrow \Upsilon(4S)$
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8.78 $\pm 0.82$ <sup>+0.85</sup> <sub>-1.76</sub>		1 GARMASH	06 BELL	$e^+e^- \rightarrow \Upsilon(4S)$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

9.47 $\pm 0.97$ <sup>+0.62</sup> <sub>-0.88</sub>		1 AUBERT,B	05N BABR	Repl. by AUBERT 08AI
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7.55 $\pm 1.24$ <sup>+1.63</sup> <sub>-1.18</sub>		1 GARMASH	05 BELL	Repl. by GARMASH 06
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9.2 $\pm 1.2$ <sup>+2.1</sup> <sub>-2.6</sub>		2 AUBERT,B	04P BABR	Repl. by AUBERT,B 05N
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9.6 <sup>+2.5</sup> <sub>-2.3</sub> <sup>+3.7</sup> <sub>-1.7</sub>		3 GARMASH	02 BELL	Repl. by GARMASH 05
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<80	90	4 AVERY	89B CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> AUBERT,B 04P also reports  $B(B^+ \rightarrow \text{"higher } f^0 \text{ resonances"} \pi^+, f(980)^0 \rightarrow \pi^+\pi^-) = (3.2 \pm 1.2^{+6.0}_{-2.9}) \times 10^{-6}$ .

<sup>3</sup> Uses a reference decay mode  $B^+ \rightarrow \bar{D}^0 \pi^+$  and  $\bar{D}^0 \rightarrow K^+ \pi^-$  with  $B(B^+ \rightarrow \bar{D}^0 \pi^+) \times B(\bar{D}^0 \rightarrow K^+ \pi^-) = (20.3 \pm 2.0) \times 10^{-5}$ . Only charged pions from the  $f_0(980)$  are used.

<sup>4</sup> AVERY 89B reports  $< 7 \times 10^{-5}$  assuming the  $\Upsilon(4S)$  decays 43% to  $B^0 \bar{B}^0$ . We rescale to 50%.

$$\Gamma(f_2(1270)^0 K^+)/\Gamma_{\text{total}} \qquad \Gamma_{337}/\Gamma$$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>1.07 <math>\pm 0.27</math></b>		<b>OUR AVERAGE</b>		

0.89 <sup>+0.38</sup> <sub>-0.33</sub> <sup>+0.01</sup> <sub>-0.03</sub>		1,2 AUBERT	08AI BABR	$e^+e^- \rightarrow \Upsilon(4S)$
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1.33 $\pm 0.30$ <sup>+0.23</sup> <sub>-0.34</sub>		1 GARMASH	06 BELL	$e^+e^- \rightarrow \Upsilon(4S)$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

<16	90	3 AUBERT,B	05N BABR	Repl. by AUBERT 08AI
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< 2.3	90	4 GARMASH	05 BELL	Repl. by GARMASH 06
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> AUBERT 08AI reports  $(0.50 \pm 0.15^{+0.15}_{-0.11}) \times 10^{-6}$  for  $B(B^+ \rightarrow f_2(1270) K^+) \times B(f_2 \rightarrow \pi^+ \pi^-)$ . We compute  $B(B^+ \rightarrow f_2(1270) K^+)$  using the PDG value  $B(f_2(1270) \rightarrow \pi\pi) = (84.2^{+2.9}_{-0.9}) \times 10^{-2}$  and 2/3 for the  $\pi^+ \pi^-$  fraction. Our first error is their experiment's error and the second error is systematic error from using our best value.

<sup>3</sup> AUBERT,B 05N reports  $8.9 \times 10^{-6}$  at 90% CL for  $B(B^+ \rightarrow f_2(1270) K^+) \times B(f_2(1270) \rightarrow \pi^+ \pi^-)$ . We rescaled it using the PDG value  $B(f_2(1270) \rightarrow \pi\pi) = 84.7\%$  and 2/3 for the  $\pi^+ \pi^-$  fraction.

<sup>4</sup> GARMASH 05 reports  $1.3 \times 10^{-6}$  at 90% CL for  $B(B^+ \rightarrow f_2(1270) K^+) \times B(f_2(1270) \rightarrow \pi^+ \pi^-)$ . We rescaled it using the PDG value  $B(f_2(1270) \rightarrow \pi\pi) = 84.7\%$  and 2/3 for the  $\pi^+ \pi^-$  fraction.

**$\Gamma(f_0(1370)^0 K^+ \times B(f_0(1370)^0 \rightarrow \pi^+ \pi^-)) / \Gamma_{\text{total}}$   $\Gamma_{338} / \Gamma$**

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b><math>&lt; 10.7 \times 10^{-6}</math></b>	90	<sup>1</sup> AUBERT,B 05N	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

**$\Gamma(\rho^0(1450) K^+ \times B(\rho^0(1450) \rightarrow \pi^+ \pi^-)) / \Gamma_{\text{total}}$   $\Gamma_{339} / \Gamma$**

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b><math>&lt; 11.7 \times 10^{-6}</math></b>	90	<sup>1</sup> AUBERT,B 05N	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

**$\Gamma(f'_2(1525) K^+ \times B(f'_2(1525) \rightarrow \pi^+ \pi^-)) / \Gamma_{\text{total}}$   $\Gamma_{340} / \Gamma$**

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b><math>&lt; 3.4 \times 10^{-6}</math></b>	90	<sup>1</sup> AUBERT,B 05N	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

**$\Gamma(K^+ \rho^0) / \Gamma_{\text{total}}$   $\Gamma_{341} / \Gamma$**

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b><math>3.7 \pm 0.5</math> OUR AVERAGE</b>				

$3.56 \pm 0.45^{+0.57}_{-0.46}$  <sup>1</sup> AUBERT 08AI BABR  $e^+ e^- \rightarrow \Upsilon(4S)$

$3.89 \pm 0.47^{+0.43}_{-0.41}$  <sup>1</sup> GARMASH 06 BELL  $e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$5.07 \pm 0.75^{+0.55}_{-0.88}$  <sup>1</sup> AUBERT,B 05N BABR Repl. by AUBERT 08AI

$4.78 \pm 0.75^{+1.01}_{-0.97}$  <sup>1</sup> GARMASH 05 BELL Repl. by GARMASH 06

$< 6.2$  90 <sup>2</sup> AUBERT,B 04P BABR Repl. by AUBERT,B 05N

$< 12$  90 <sup>3</sup> GARMASH 02 BELL  $e^+ e^- \rightarrow \Upsilon(4S)$

$< 86$  90 <sup>4</sup> ABE 00C SLD  $e^+ e^- \rightarrow Z$

$< 17$  90 <sup>1</sup> JESSOP 00 CLE2  $e^+ e^- \rightarrow \Upsilon(4S)$

$< 120$  90 <sup>5</sup> ADAM 96D DLPH  $e^+ e^- \rightarrow Z$

$< 19$  90 ASNER 96 CLE2 Repl. by JESSOP 00

$< 190$  90 <sup>5</sup> ABREU 95N DLPH Sup. by ADAM 96D

$< 180$  90 ALBRECHT 91B ARG  $e^+ e^- \rightarrow \Upsilon(4S)$

$< 80$  90 <sup>6</sup> AVERY 89B CLEO  $e^+ e^- \rightarrow \Upsilon(4S)$

$< 260$  90 AVERY 87 CLEO  $e^+ e^- \rightarrow \Upsilon(4S)$

- <sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .  
<sup>2</sup> AUBERT 04P reports a central value of  $(3.9 \pm 1.2^{+1.3}_{-3.5}) \times 10^{-6}$  for this branching ratio.  
<sup>3</sup> Uses a reference decay mode  $B^+ \rightarrow \bar{D}^0 \pi^+$  and  $\bar{D}^0 \rightarrow K^+ \pi^-$  with  $B(B^+ \rightarrow \bar{D}^0 \pi^+) \cdot B(\bar{D}^0 \rightarrow K^+ \pi^-) = (20.3 \pm 2.0) \times 10^{-5}$ .  
<sup>4</sup> ABE 00C assumes  $B(Z \rightarrow b\bar{b}) = (21.7 \pm 0.1)\%$  and the  $B$  fractions  $f_{B^0} = f_{B^+} = (39.7^{+1.8}_{-2.2})\%$  and  $f_{B_s} = (10.5^{+1.8}_{-2.2})\%$ .  
<sup>5</sup> Assumes production fractions  $f_{B^0} = f_{B^-} = 0.39$  and  $f_{B_s} = 0.12$ .  
<sup>6</sup> AVERY 89B reports  $< 7 \times 10^{-5}$  assuming the  $\Upsilon(4S)$  decays 43% to  $B^0 \bar{B}^0$ . We rescale to 50%.

**$\Gamma(K_0^*(1430)^0 \pi^+) / \Gamma_{\text{total}}$   $\Gamma_{342} / \Gamma$**

VALUE (units  $10^{-6}$ )      DOCUMENT ID    TECN    COMMENT

**45  $^{+9}_{-7}$  OUR AVERAGE** Error includes scale factor of 1.5.

32.0  $\pm 1.2^{+10.8}_{-6.0}$       <sup>1</sup> AUBERT    08AI    BABR     $e^+ e^- \rightarrow \Upsilon(4S)$

51.6  $\pm 1.7^{+7.0}_{-7.5}$       <sup>1</sup> GARMASH    06    BELL     $e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

44.4  $\pm 2.2 \pm 5.3$       <sup>1,2</sup> AUBERT,B    05N    BABR    Repl. by AUBERT 08AI

45.0  $\pm 2.9^{+15.0}_{-10.7}$       <sup>1</sup> GARMASH    05    BELL    Repl. by GARMASH 06

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> See erratum: AUBERT, BE 06A.

**$\Gamma(K_2^*(1430)^0 \pi^+) / \Gamma_{\text{total}}$   $\Gamma_{343} / \Gamma$**

VALUE (units  $10^{-6}$ )    CL%      DOCUMENT ID    TECN    COMMENT

**5.6  $^{+2.2}_{-1.5} \pm 0.1$**       <sup>1,2</sup> AUBERT    08AI    BABR     $e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$< 23$       90      <sup>3</sup> AUBERT,B    05N    BABR    Repl. by AUBERT 08AI

$< 6.9$       90      <sup>4</sup> GARMASH    05    BELL     $e^+ e^- \rightarrow \Upsilon(4S)$

$< 680$       90      ALBRECHT    91B    ARG     $e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> AUBERT 08AI reports  $(1.85 \pm 0.41^{+0.61}_{-0.29}) \times 10^{-6}$  for  $B(B^+ \rightarrow K_2^*(1430)^0 \pi^+) \times B(K_2^*(1430)^0 \rightarrow K^+ \pi^-)$ . We compute  $B(B^+ \rightarrow K_2^*(1430)^0 \pi^+)$  using the PDG value  $B(K_2^*(1430)^0 \rightarrow K \pi) = (49.9 \pm 1.2) \times 10^{-2}$  and 2/3 for the  $K^+ \pi^-$  fraction. Our first error is their experiment's error and the second error is systematic error from using our best value.

<sup>3</sup> AUBERT,B 05N reports  $7.7 \times 10^{-6}$  at 90% CL for  $B(B^+ \rightarrow K_2^*(1430)^0 \pi^+) \times B(K_2^*(1430)^0 \rightarrow K^+ \pi^-)$ . We rescaled it using the PDG value  $B(K_2^*(1430)^0 \rightarrow K \pi) = 49.9\%$  and 2/3 for the  $K^+ \pi^-$  fraction.

<sup>4</sup> GARMASH 05 reports  $2.3 \times 10^{-6}$  at 90% CL for  $B(B^+ \rightarrow K_2^*(1430)^0 \pi^+) \times B(K_2^*(1430)^0 \rightarrow K^+ \pi^-)$ . We rescaled it using the PDG value  $B(K_2^*(1430)^0 \rightarrow K \pi) = 49.9\%$  and 2/3 for the  $K^+ \pi^-$  mode.

$\Gamma(K^*(1410)^0 \pi^+)/\Gamma_{\text{total}}$   $\Gamma_{344}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
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**<45** 90 <sup>1</sup>GARMASH 05 BELL  $e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup>GARMASH 05 reports  $2.0 \times 10^{-6}$  at 90% CL for  $B(B^+ \rightarrow K^*(1410)^0 \pi^+) \times B(K^*(1410)^0 \rightarrow K^+ \pi^-)$ . We rescaled it using the PDG value  $B(K^*(1410)^0 \rightarrow K\pi) = 6.6\%$  and 2/3 for the  $K^+ \pi^-$  mode.

$\Gamma(K^*(1680)^0 \pi^+)/\Gamma_{\text{total}}$   $\Gamma_{345}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
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**<12** 90 <sup>1</sup>GARMASH 05 BELL  $e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

<15 90 <sup>2</sup>AUBERT,B 05N BABR  $e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup>GARMASH 05 reports  $3.1 \times 10^{-6}$  at 90% CL for  $B(B^+ \rightarrow K^*(1680)^0 \pi^+) \times B(K^*(1680)^0 \rightarrow K^+ \pi^-)$ . We rescaled it using the PDG value  $B(K^*(1680)^0 \rightarrow K\pi) = 38.7\%$  and 2/3 for the  $K^+ \pi^-$  mode.

<sup>2</sup>AUBERT,B 05N reports  $3.8 \times 10^{-6}$  at 90% CL for  $B(B^+ \rightarrow K^*(1680)^0 \pi^+) \times B(K^*(1680)^0 \rightarrow K^+ \pi^-)$ . We rescaled it using the PDG value  $B(K^*(1680)^0 \rightarrow K\pi) = 38.7\%$  and 2/3 for the  $K^+ \pi^-$  fraction.

$\Gamma(K^+ \pi^0 \pi^0)/\Gamma_{\text{total}}$   $\Gamma_{346}/\Gamma$

VALUE (units $10^{-6}$ )	DOCUMENT ID	TECN	COMMENT
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**16.2±1.2±1.5** <sup>1</sup>LEES 11l BABR  $e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup>Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(f_0(980)K^+ \times B(f_0 \rightarrow \pi^0 \pi^0))/\Gamma_{\text{total}}$   $\Gamma_{347}/\Gamma$

VALUE (units $10^{-6}$ )	DOCUMENT ID	TECN	COMMENT
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**2.8±0.6±0.5** <sup>1</sup>LEES 11l BABR  $e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup>Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(K^- \pi^+ \pi^+)/\Gamma_{\text{total}}$   $\Gamma_{348}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
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**<0.95** 90 <sup>1</sup>AUBERT 08BE BABR  $e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

<4.5 90 <sup>1</sup>GARMASH 04 BELL  $e^+e^- \rightarrow \Upsilon(4S)$

<1.8 90 <sup>2</sup>AUBERT 03M BABR Repl. by AUBERT 08BE

<7.0 90 <sup>3</sup>GARMASH 02 BELL  $e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup>Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup>Assumes equal production of  $B^0$  and  $B^+$  at the  $\Upsilon(4S)$ ; charm and charmonium contributions are subtracted, otherwise no assumptions about intermediate resonances.

<sup>3</sup>Uses a reference decay mode  $B^+ \rightarrow \bar{D}^0 \pi^+$  and  $\bar{D}^0 \rightarrow K^+ \pi^-$  with  $B(B^+ \rightarrow \bar{D}^0 \pi^+) \cdot B(\bar{D}^0 \rightarrow K^+ \pi^-) = (20.3 \pm 2.0) \times 10^{-5}$ .

$\Gamma(K^- \pi^+ \pi^+ \text{nonresonant})/\Gamma_{\text{total}}$   $\Gamma_{349}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
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**<56** 90 BERGFELD 96B CLE2  $e^+e^- \rightarrow \Upsilon(4S)$

$\Gamma(K_1(1270)^0 \pi^+)/\Gamma_{\text{total}}$   $\Gamma_{350}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<4.0 \times 10^{-5}$	90	<sup>1</sup> AUBERT	10D BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(K_1(1400)^0 \pi^+)/\Gamma_{\text{total}}$   $\Gamma_{351}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<3.9 \times 10^{-5}$	90	<sup>1</sup> AUBERT	10D BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$<2.6 \times 10^{-3}$	90	ALBRECHT	91B ARG	$e^+ e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(K^0 \pi^+ \pi^0)/\Gamma_{\text{total}}$   $\Gamma_{352}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<66 \times 10^{-6}$	90	<sup>1</sup> ECKHART	02 CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(K^0 \rho^+)/\Gamma_{\text{total}}$   $\Gamma_{353}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
$8.0^{+1.4}_{-1.3} \pm 0.6$		AUBERT	07Z BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$<48$	90	ASNER	96 CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$
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$\Gamma(K^*(892)^+ \pi^+ \pi^-)/\Gamma_{\text{total}}$   $\Gamma_{354}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
$75.3 \pm 6.0 \pm 8.1$		<sup>1</sup> AUBERT,B	06U BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$<1100$	90	ALBRECHT	91E ARG	$e^+ e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(K^*(892)^+ \rho^0)/\Gamma_{\text{total}}$   $\Gamma_{355}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
$4.6 \pm 1.0 \pm 0.4$		<sup>1</sup> DEL-AMO-SA..11D	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$< 6.1$	90	<sup>1</sup> AUBERT,B	06G BABR	Repl. by DEL-AMO-SANCHEZ 11D
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$10.6^{+3.0}_{-2.6} \pm 2.4$		<sup>1</sup> AUBERT	03V BABR	Repl. by AUBERT,B 06G
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$< 74$	90	<sup>2</sup> GODANG	02 CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$
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$<900$	90	ALBRECHT	91B ARG	$e^+ e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> Assumes a helicity 00 configuration. For a helicity 11 configuration, the limit decreases to  $4.9 \times 10^{-5}$ .

$\Gamma(K^*(892)^+ f_0(980))/\Gamma_{\text{total}}$   $\Gamma_{356}/\Gamma$ 

VALUE (units $10^{-6}$ )	DOCUMENT ID	TECN	COMMENT
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<b><math>4.2 \pm 0.6 \pm 0.3</math></b>	<sup>1</sup> DEL-AMO-SA..11D	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

$5.2 \pm 1.2 \pm 0.5$	<sup>1</sup> AUBERT,B	06G	BABR Repl. by DEL-AMO-SANCHEZ 11D
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

 $\Gamma(a_1^+ K^0)/\Gamma_{\text{total}}$   $\Gamma_{357}/\Gamma$ 

VALUE (units $10^{-6}$ )	DOCUMENT ID	TECN	COMMENT
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<b><math>34.9 \pm 5.0 \pm 4.4</math></b>	<sup>1,2</sup> AUBERT	08F	BABR $e^+ e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> Assumes  $a_1^\pm$  decays only to  $3\pi$  and  $B(a_1^\pm \rightarrow \pi^\pm \pi^\mp \pi^\pm) = 0.5$ .

 $\Gamma(b_1^+ K^0 \times B(b_1^+ \rightarrow \omega \pi^+))/\Gamma_{\text{total}}$   $\Gamma_{358}/\Gamma$ 

VALUE (units $10^{-6}$ )	DOCUMENT ID	TECN	COMMENT
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<b><math>9.6 \pm 1.7 \pm 0.9</math></b>	<sup>1</sup> AUBERT	08AG	BABR $e^+ e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

 $\Gamma(K^*(892)^0 \rho^+)/\Gamma_{\text{total}}$   $\Gamma_{359}/\Gamma$ 

VALUE (units $10^{-6}$ )	DOCUMENT ID	TECN	COMMENT
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**$9.2 \pm 1.5$  OUR AVERAGE**

$9.6 \pm 1.7 \pm 1.5$	<sup>1</sup> AUBERT,B	06G	BABR $e^+ e^- \rightarrow \Upsilon(4S)$
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$8.9 \pm 1.7 \pm 1.2$	<sup>1</sup> ZHANG	05D	BELL $e^+ e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

 $\Gamma(K_1(1400)^+ \rho^0)/\Gamma_{\text{total}}$   $\Gamma_{360}/\Gamma$ 

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
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$< 7.8 \times 10^{-4}$	90	ALBRECHT	91B	ARG $e^+ e^- \rightarrow \Upsilon(4S)$
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 $\Gamma(K_2^*(1430)^+ \rho^0)/\Gamma_{\text{total}}$   $\Gamma_{361}/\Gamma$ 

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
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$< 1.5 \times 10^{-3}$	90	ALBRECHT	91B	ARG $e^+ e^- \rightarrow \Upsilon(4S)$
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 $\Gamma(b_1^0 K^+ \times B(b_1^0 \rightarrow \omega \pi^0))/\Gamma_{\text{total}}$   $\Gamma_{362}/\Gamma$ 

VALUE (units $10^{-6}$ )	DOCUMENT ID	TECN	COMMENT
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<b><math>9.1 \pm 1.7 \pm 1.0</math></b>	<sup>1</sup> AUBERT	07BI	BABR $e^+ e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

 $\Gamma(b_1^+ K^{*0} \times B(b_1^+ \rightarrow \omega \pi^+))/\Gamma_{\text{total}}$   $\Gamma_{363}/\Gamma$ 

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
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$< 5.9 \times 10^{-6}$	90	<sup>1</sup> AUBERT	09AF	BABR $e^+ e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(b_1^0 K^{*+} \times B(b_1^0 \rightarrow \omega \pi^0))/\Gamma_{\text{total}}$   $\Gamma_{364}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<6.7 \times 10^{-6}$	90	<sup>1</sup> AUBERT	09AF BABR	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(K^+ \bar{K}^0)/\Gamma_{\text{total}}$   $\Gamma_{365}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b><math>1.31 \pm 0.17</math> OUR FIT</b>		Error includes scale factor of 1.2.		
<b><math>1.19 \pm 0.18</math> OUR AVERAGE</b>				
$1.11 \pm 0.19 \pm 0.05$		<sup>1</sup> DUH	13 BELL	$e^+e^- \rightarrow \Upsilon(4S)$
$1.61 \pm 0.44 \pm 0.09$		<sup>1</sup> AUBERT, BE	06C BABR	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$1.22^{+0.32+0.13}_{-0.28-0.16}$		<sup>1</sup> LIN	07 BELL	Repl. by DUH 13
$1.0 \pm 0.4 \pm 0.1$		<sup>1</sup> ABE	05G BELL	Repl. by LIN 07
$1.5 \pm 0.5 \pm 0.1$		<sup>1</sup> AUBERT, BE	05E BABR	Repl. by AUBERT, BE 06C
$< 2.5$	90	<sup>1</sup> AUBERT	04M BABR	Repl. by AUBERT, BE 05E
$< 3.3$	90	<sup>1</sup> CHAO	04 BELL	$e^+e^- \rightarrow \Upsilon(4S)$
$< 3.3$	90	<sup>1</sup> BORNHEIM	03 CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
$< 2.0$	90	<sup>1</sup> CASEY	02 BELL	Repl. by CHAO 04
$< 5.0$	90	<sup>1</sup> ABE	01H BELL	$e^+e^- \rightarrow \Upsilon(4S)$
$< 2.4$	90	<sup>1</sup> AUBERT	01E BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$< 5.1$	90	<sup>1</sup> CRONIN-HEN..00	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
$< 21$	90	GODANG	98 CLE2	Repl. by CRONIN-HENNESSY 00

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(K^+ \bar{K}^0)/\Gamma(K^0 \pi^+)$   $\Gamma_{365}/\Gamma_{305}$

VALUE	DOCUMENT ID	TECN	COMMENT
<b><math>0.055 \pm 0.007</math> OUR FIT</b>	Error includes scale factor of 1.2.		
<b><math>0.064 \pm 0.009 \pm 0.004</math></b>	AAIJ	13BS LHCB	$pp$ at 7 TeV

$\Gamma(\bar{K}^0 K^+ \pi^0)/\Gamma_{\text{total}}$   $\Gamma_{366}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$< 24 \times 10^{-6}$	90	<sup>1</sup> ECKHART	02 CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(K^+ K_S^0 K_S^0)/\Gamma_{\text{total}}$   $\Gamma_{367}/\Gamma$

VALUE (units $10^{-6}$ )	DOCUMENT ID	TECN	COMMENT
<b><math>10.8 \pm 0.6</math> OUR AVERAGE</b>			
$10.6 \pm 0.5 \pm 0.3$	<sup>1,2</sup> LEES	120 BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$13.4 \pm 1.9 \pm 1.5$	<sup>1</sup> GARMASH	04 BELL	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$10.7 \pm 1.2 \pm 1.0$	<sup>1</sup> AUBERT, B	04V BABR	Repl. by LEES 120
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> All intermediate charmonium and charm resonances are removed, except of  $\chi_{c0}$ .

$\Gamma(f_0(980)K^+, f_0 \rightarrow K_S^0 K_S^0)/\Gamma_{\text{total}}$   $\Gamma_{368}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>14.7±2.8±1.8</b>		<sup>1</sup> LEES	120 BABR	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(f_0(1710)K^+, f_0 \rightarrow K_S^0 K_S^0)/\Gamma_{\text{total}}$   $\Gamma_{369}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>0.48<sup>+0.40</sup><sub>-0.24</sub>±0.11</b>		<sup>1</sup> LEES	120 BABR	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(K^+ K_S^0 K_S^0 \text{nonresonant})/\Gamma_{\text{total}}$   $\Gamma_{370}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>19.8±3.7±2.5</b>		<sup>1</sup> LEES	120 BABR	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(K_S^0 K_S^0 \pi^+)/\Gamma_{\text{total}}$   $\Gamma_{371}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;0.51</b>	90	<sup>1</sup> AUBERT	09J BABR	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

<3.2	90	<sup>1</sup> GARMASH	04 BELL	$e^+e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(K^+ K^- \pi^+)/\Gamma_{\text{total}}$   $\Gamma_{372}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>5.0±0.5±0.5</b>		<sup>1</sup> AUBERT	07BB BABR	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

<13	90	<sup>1</sup> GARMASH	04 BELL	$e^+e^- \rightarrow \Upsilon(4S)$
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< 6.3	90	<sup>1,2</sup> AUBERT	03M BABR	Repl. by AUBERT 07BB
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<12	90	<sup>3</sup> GARMASH	02 BELL	$e^+e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> Charm and charmonium contributions are subtracted, otherwise no assumptions about intermediate resonances.

<sup>3</sup> Uses a reference decay mode  $B^+ \rightarrow \bar{D}^0 \pi^+$  and  $\bar{D}^0 \rightarrow K^+ \pi^-$  with  $B(B^+ \rightarrow \bar{D}^0 \pi^+) \cdot B(\bar{D}^0 \rightarrow K^+ \pi^-) = (20.3 \pm 2.0) \times 10^{-5}$ .

$\Gamma(K^+ K^- \pi^+ \text{nonresonant})/\Gamma_{\text{total}}$   $\Gamma_{373}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;75</b>	90	BERGFELD	96B CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

$\Gamma(K^+ \bar{K}^*(892)^0)/\Gamma_{\text{total}}$   $\Gamma_{374}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt; 1.1</b>	90	<sup>1</sup> AUBERT	07AR BABR	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

<129	90	ABBIENDI	00B OPAL	$e^+e^- \rightarrow Z$
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<138	90	<sup>2</sup> ABE	00C SLD	$e^+e^- \rightarrow Z$
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< 5.3	90	<sup>1</sup> JESSOP	00 CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> ABE 00C assumes  $B(Z \rightarrow b\bar{b}) = (21.7 \pm 0.1)\%$  and the  $B$  fractions  $f_{B^0} = f_{B^+} = (39.7^{+1.8}_{-2.2})\%$  and  $f_{B_s} = (10.5^{+1.8}_{-2.2})\%$ .

$\Gamma(K^+ \bar{K}_0^*(1430)^0) / \Gamma_{\text{total}}$   $\Gamma_{375} / \Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<2.2	90	<sup>1</sup> AUBERT	07AR BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(K^+ K^+ \pi^-) / \Gamma_{\text{total}}$   $\Gamma_{376} / \Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<1.6 $\times 10^{-7}$	90	<sup>1</sup> AUBERT	08BE BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

<2.4 $\times 10^{-6}$	90	<sup>1</sup> GARMASH	04 BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
<1.3 $\times 10^{-6}$	90	<sup>2</sup> AUBERT	03M BABR	Repl. by AUBERT 08BE
<3.2 $\times 10^{-6}$	90	<sup>3</sup> GARMASH	02 BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> Assumes equal production of  $B^0$  and  $B^+$  at the  $\Upsilon(4S)$ ; charm and charmonium contributions are subtracted, otherwise no assumptions about intermediate resonances.

<sup>3</sup> Uses a reference decay mode  $B^+ \rightarrow \bar{D}^0 \pi^+$  and  $\bar{D}^0 \rightarrow K^+ \pi^-$  with  $B(B^+ \rightarrow \bar{D}^0 \pi^+) \cdot B(\bar{D}^0 \rightarrow K^+ \pi^-) = (20.3 \pm 2.0) \times 10^{-5}$ .

$\Gamma(K^+ K^+ \pi^- \text{ nonresonant}) / \Gamma_{\text{total}}$   $\Gamma_{377} / \Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<87.9	90	ABBIENDI	00B OPAL	$e^+ e^- \rightarrow Z$

$\Gamma(f_2'(1525) K^+) / \Gamma_{\text{total}}$   $\Gamma_{378} / \Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>1.8 <math>\pm 0.5</math> OUR AVERAGE</b>		Error includes scale factor of 1.1.		
1.56 $\pm 0.36 \pm 0.30$		<sup>1,2</sup> LEES	120 BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
2.8 $\pm 0.9^{+0.5}_{-0.4}$		<sup>1,3</sup> LEES	120 BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

<8	90	<sup>1,4</sup> GARMASH	05 BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> Measured in the  $B^+ \rightarrow K^+ K^- K^+$  decay.

<sup>3</sup> Measured in the  $B^+ \rightarrow K^+ K_S^0 K_S^0$  decay.

<sup>4</sup> GARMASH 05 reports  $B(B^+ \rightarrow f_2'(1525) K^+) \cdot B(f_2'(1525) \rightarrow K^+ K^-) < 4.9 \times 10^{-6}$  at 90% CL. We divide this result by our best value of  $B(f_2'(1525) \rightarrow K \bar{K}) = 88.7 \times 10^{-2}$  multiplied by 2/3 to account for the  $K^+ K^-$  fraction.

$\Gamma(K^+ f_J(2220)) / \Gamma_{\text{total}}$   $\Gamma_{379} / \Gamma$

VALUE (units $10^{-6}$ )	DOCUMENT ID	TECN	COMMENT
not seen	<sup>1</sup> HUANG	03 BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> No evidence is found for such decay and set a limit on  $B(B^+ \rightarrow f_J(2220)) \times B(f_J(2220) \rightarrow \phi\phi) < 1.2 \times 10^{-6}$  at 90%CL where the  $f_J(2220)$  is a possible glueball state.



$\Gamma(K^{*+}\pi^+K^-)/\Gamma_{\text{total}}$   $\Gamma_{380}/\Gamma$ 

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;11.8</b>	90	<sup>1</sup> AUBERT,B	06U BABR	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

 $\Gamma(K^*(892)^+K^*(892)^0)/\Gamma_{\text{total}}$   $\Gamma_{381}/\Gamma$ 

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>0.91 ± 0.29 OUR AVERAGE</b>				
$0.77^{+0.35}_{-0.30} \pm 0.12$		<sup>1</sup> GOH	15 BELL	$e^+e^- \rightarrow \Upsilon(4S)$
$1.2 \pm 0.5 \pm 0.1$		<sup>2</sup> AUBERT	09F BABR	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

<71	90	<sup>3</sup> GODANG	02 CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Signal significance is 2.7 standard deviations. This measurement corresponds to an upper limit of  $< 1.31 \times 10^{-6}$  at 90% CL.

<sup>2</sup> Signal significance is 3.7 standard deviations.

<sup>3</sup> Assumes a helicity 00 configuration. For a helicity 11 configuration, the limit decreases to  $4.8 \times 10^{-5}$ .

 $\Gamma(K^{*+}K^+\pi^-)/\Gamma_{\text{total}}$   $\Gamma_{382}/\Gamma$ 

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;6.1</b>	90	<sup>1</sup> AUBERT,B	06U BABR	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

 $\Gamma(K^+K^-K^+)/\Gamma_{\text{total}}$   $\Gamma_{383}/\Gamma$ 

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>34.0 ± 1.4 OUR AVERAGE</b> Error includes scale factor of 1.4.				
$34.6 \pm 0.6 \pm 0.9$		<sup>1,2</sup> LEES	120 BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$30.6 \pm 1.2 \pm 2.3$		<sup>1</sup> GARMASH	05 BELL	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$35.2 \pm 0.9 \pm 1.6$		<sup>1</sup> AUBERT	06O BABR	Repl. by LEES 120
$32.8 \pm 1.8 \pm 2.8$		<sup>1</sup> GARMASH	04 BELL	Repl. by GARMASH 05
$29.6 \pm 2.1 \pm 1.6$		<sup>3</sup> AUBERT	03M BABR	Repl. by AUBERT 060
$35.3 \pm 3.7 \pm 4.5$		<sup>4</sup> GARMASH	02 BELL	Repl. by GARMASH 04
<200	90	<sup>5</sup> ADAM	96D DLPH	$e^+e^- \rightarrow Z$
<320	90	<sup>5</sup> ABREU	95N DLPH	Sup. by ADAM 96D
<350	90	ALBRECHT	91E ARG	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> All intermediate charmonium and charm resonances are removed, except of  $\chi_{c0}$ .

<sup>3</sup> Assumes equal production of  $B^0$  and  $B^+$  at the  $\Upsilon(4S)$ ; charm and charmonium contributions are subtracted, otherwise no assumptions about intermediate resonances.

<sup>4</sup> Uses a reference decay mode  $B^+ \rightarrow \bar{D}^0\pi^+$  and  $\bar{D}^0 \rightarrow K^+\pi^-$  with  $B(B^+ \rightarrow \bar{D}^0\pi^+) \cdot B(\bar{D}^0 \rightarrow K^+\pi^-) = (20.3 \pm 2.0) \times 10^{-5}$ .

<sup>5</sup> Assumes  $B^0$  and  $B^-$  production fractions of 0.39, and  $B_s$  production fraction of 0.12.

$\Gamma(K^+\phi)/\Gamma_{\text{total}}$   $\Gamma_{384}/\Gamma$

VALUE (units  $10^{-6}$ )    CL%    DOCUMENT ID    TECN    COMMENT

**8.8  $^{+0.7}_{-0.6}$  OUR AVERAGE** Error includes scale factor of 1.1.

9.2 $\pm 0.4$ $^{+0.7}_{-0.5}$	1	LEES	120	BABR	$e^+e^- \rightarrow \gamma(4S)$
7.6 $\pm 1.3$ $\pm 0.6$	2	ACOSTA	05J	CDF	$p\bar{p}$ at 1.96 TeV
9.60 $\pm 0.92$ $^{+1.05}_{-0.85}$	1	GARMASH	05	BELL	$e^+e^- \rightarrow \gamma(4S)$
5.5 $^{+2.1}_{-1.8}$ $\pm 0.6$	1	BRIERE	01	CLE2	$e^+e^- \rightarrow \gamma(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

8.4 $\pm 0.7$ $\pm 0.7$	1	AUBERT	06O	BABR	Repl. by LEES 120
10.0 $^{+0.9}_{-0.8}$ $\pm 0.5$	1	AUBERT	04A	BABR	Repl. by AUBERT 06O
9.4 $\pm 1.1$ $\pm 0.7$	1	CHEN	03B	BELL	Repl. by GARMASH 05
14.6 $^{+3.0}_{-2.8}$ $\pm 2.0$	3	GARMASH	02	BELL	Repl. by CHEN 03B
7.7 $^{+1.6}_{-1.4}$ $\pm 0.8$	1	AUBERT	01D	BABR	$e^+e^- \rightarrow \gamma(4S)$
<144	90	4 ABE	00C	SLD	$e^+e^- \rightarrow Z$
< 5	90	1 BERGFELD	98	CLE2	
<280	90	5 ADAM	96D	DLPH	$e^+e^- \rightarrow Z$
< 12	90	ASNER	96	CLE2	$e^+e^- \rightarrow \gamma(4S)$
<440	90	6 ABREU	95N	DLPH	Sup. by ADAM 96D
<180	90	ALBRECHT	91B	ARG	$e^+e^- \rightarrow \gamma(4S)$
< 90	90	7 AVERY	89B	CLEO	$e^+e^- \rightarrow \gamma(4S)$
<210	90	AVERY	87	CLEO	$e^+e^- \rightarrow \gamma(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\gamma(4S)$ .

<sup>2</sup> Uses  $B(B^+ \rightarrow J/\psi K^+) = (1.00 \pm 0.04) \times 10^{-3}$  and  $B(J/\psi \rightarrow \mu^+ \mu^-) = 0.0588 \pm 0.0010$ .

<sup>3</sup> Uses a reference decay mode  $B^+ \rightarrow \bar{D}^0 \pi^+$  and  $\bar{D}^0 \rightarrow K^+ \pi^-$  with  $B(B^+ \rightarrow \bar{D}^0 \pi^+) \cdot B(\bar{D}^0 \rightarrow K^+ \pi^-) = (20.3 \pm 2.0) \times 10^{-5}$ .

<sup>4</sup> ABE 00C assumes  $B(Z \rightarrow b\bar{b}) = (21.7 \pm 0.1)\%$  and the  $B$  fractions  $f_{B^0} = f_{B^+} = (39.7^{+1.8}_{-2.2})\%$  and  $f_{B_s} = (10.5^{+1.8}_{-2.2})\%$ .

<sup>5</sup> ADAM 96D assumes  $f_{B^0} = f_{B^-} = 0.39$  and  $f_{B_s} = 0.12$ .

<sup>6</sup> Assumes a  $B^0, B^-$  production fraction of 0.39 and a  $B_s$  production fraction of 0.12.

<sup>7</sup> AVERY 89B reports  $< 8 \times 10^{-5}$  assuming the  $\gamma(4S)$  decays 43% to  $B^0 \bar{B}^0$ . We rescale to 50%.

$\Gamma(f_0(980)K^+ \times B(f_0(980) \rightarrow K^+ K^-))/\Gamma_{\text{total}}$   $\Gamma_{385}/\Gamma$

VALUE (units  $10^{-6}$ )    CL%    DOCUMENT ID    TECN    COMMENT

**9.4  $\pm 1.6 \pm 2.8$**     1 LEES    120 BABR  $e^+e^- \rightarrow \gamma(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

6.5 $\pm 2.5 \pm 1.6$	1	AUBERT	06O	BABR	$e^+e^- \rightarrow \gamma(4S)$
<2.9	90	1 GARMASH	05	BELL	$e^+e^- \rightarrow \gamma(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\gamma(4S)$ .

$$\Gamma(a_2(1320)K^+ \times B(a_2(1320) \rightarrow K^+ K^-))/\Gamma_{\text{total}} \quad \Gamma_{386}/\Gamma$$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<1.1 \times 10^{-6}$	90	<sup>1</sup> GARMASH 05	BELL	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$$\Gamma(X_0(1550)K^+ \times B(X_0(1550) \rightarrow K^+ K^-))/\Gamma_{\text{total}} \quad \Gamma_{387}/\Gamma$$

$X_0(1550)$  is a possible spin zero state near 1.55 GeV/c<sup>2</sup> invariant mass of  $K^+ K^-$ .

VALUE (units $10^{-6}$ )	DOCUMENT ID	TECN	COMMENT
$4.3 \pm 0.6 \pm 0.3$	<sup>1</sup> AUBERT 06O	BABR	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$$\Gamma(\phi(1680)K^+ \times B(\phi(1680) \rightarrow K^+ K^-))/\Gamma_{\text{total}} \quad \Gamma_{388}/\Gamma$$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<0.8 \times 10^{-6}$	90	<sup>1</sup> GARMASH 05	BELL	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$$\Gamma(f_0(1710)K^+ \times B(f_0(1710) \rightarrow K^+ K^-))/\Gamma_{\text{total}} \quad \Gamma_{389}/\Gamma$$

VALUE (units $10^{-6}$ )	DOCUMENT ID	TECN	COMMENT
$1.12 \pm 0.25 \pm 0.50$	<sup>1</sup> LEES 12O	BABR	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$1.7 \pm 1.0 \pm 0.3$	<sup>1</sup> AUBERT 06O	BABR	Repl. by LEES 12O
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$$\Gamma(K^+ K^- K^+ \text{ nonresonant})/\Gamma_{\text{total}} \quad \Gamma_{390}/\Gamma$$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
$23.8^{+2.8}_{-5.0}$ OUR AVERAGE				

$22.8 \pm 2.7 \pm 7.6$  <sup>1</sup> LEES 12O BABR  $e^+e^- \rightarrow \Upsilon(4S)$

$24.0 \pm 1.5^{+2.6}_{-6.0}$  <sup>1</sup> GARMASH 05 BELL  $e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$50.0 \pm 6.0 \pm 4.0$  <sup>1</sup> AUBERT 06O BABR Repl. by LEES 12O

$<38$  90 BERGFELD 96B CLE2  $e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$$\Gamma(K^*(892)^+ K^+ K^-)/\Gamma_{\text{total}} \quad \Gamma_{391}/\Gamma$$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
$36.2 \pm 3.3 \pm 3.6$		<sup>1</sup> AUBERT,B 06U	BABR	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$<1600$  90 ALBRECHT 91E ARG  $e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(K^*(892)^+\phi)/\Gamma_{\text{total}}$   $\Gamma_{392}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>10.0±2.0 OUR AVERAGE</b>		Error includes scale factor of 1.7.		
11.2±1.0±0.9		<sup>1</sup> AUBERT	07BA BABR	$e^+e^- \rightarrow \Upsilon(4S)$
6.7 <sup>+2.1+0.7</sup> <sub>-1.9-1.0</sub>		<sup>1</sup> CHEN	03B BELL	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

12.7 <sup>+2.2</sup> <sub>-2.0</sub> ±1.1		<sup>1</sup> AUBERT	03V BABR	Repl. by AUBERT 07BA
9.7 <sup>+4.2</sup> <sub>-3.4</sub> ±1.7		<sup>1</sup> AUBERT	01D BABR	Repl. by AUBERT 03V
< 22.5	90	<sup>1</sup> BRIERE	01 CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
< 41	90	<sup>1</sup> BERGFELD	98 CLE2	
< 70	90	ASNER	96 CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
<1300	90	ALBRECHT	91B ARG	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\phi(K\pi)_0^{*+})/\Gamma_{\text{total}}$   $\Gamma_{393}/\Gamma$

$(K\pi)_0^{*+}$  is the total S-wave composed of  $K_0^*(1430)$  and nonresonant that are described using LASS shape.

VALUE (units $10^{-6}$ )	DOCUMENT ID	TECN	COMMENT
<b>8.3±1.4±0.8</b>	<sup>1</sup> AUBERT	08BI BABR	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\phi K_1(1270)^+)/\Gamma_{\text{total}}$   $\Gamma_{394}/\Gamma$

VALUE (units $10^{-6}$ )	DOCUMENT ID	TECN	COMMENT
<b>6.1±1.6±1.1</b>	<sup>1</sup> AUBERT	08BI BABR	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\phi K_1(1400)^+)/\Gamma_{\text{total}}$   $\Gamma_{395}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
< <b>3.2</b>	90	<sup>1</sup> AUBERT	08BI BABR	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

<1100	90	ALBRECHT	91B ARG	$e^+e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\phi K^*(1410)^+)/\Gamma_{\text{total}}$   $\Gamma_{396}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
< <b>4.3</b>	90	<sup>1</sup> AUBERT	08BI BABR	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\phi K_0^*(1430)^+)/\Gamma_{\text{total}}$   $\Gamma_{397}/\Gamma$

VALUE (units $10^{-6}$ )	DOCUMENT ID	TECN	COMMENT
<b>7.0±1.3±0.9</b>	<sup>1</sup> AUBERT	08BI BABR	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\phi K_2^*(1430)^+)/\Gamma_{\text{total}}$   $\Gamma_{398}/\Gamma$ 

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b><math>8.4 \pm 1.8 \pm 1.0</math></b>		<sup>1</sup> AUBERT	08BI BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$<3400$  90 ALBRECHT 91B ARG  $e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

 $\Gamma(\phi K_2^*(1770)^+)/\Gamma_{\text{total}}$   $\Gamma_{399}/\Gamma$ 

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b><math>&lt;15.0</math></b>	90	<sup>1</sup> AUBERT	08BI BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

 $\Gamma(\phi K_2^*(1820)^+)/\Gamma_{\text{total}}$   $\Gamma_{400}/\Gamma$ 

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b><math>&lt;16.3</math></b>	90	<sup>1</sup> AUBERT	08BI BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

 $\Gamma(a_1^+ K^{*0})/\Gamma_{\text{total}}$   $\Gamma_{401}/\Gamma$ 

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b><math>&lt;3.6</math></b>	90	<sup>1,2</sup> DEL-AMO-SA..10I	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes  $B(a_1^\pm \rightarrow \pi^\pm \pi^\mp \pi^\pm) = 0.5$

<sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

 $\Gamma(K^+ \phi \phi)/\Gamma_{\text{total}}$   $\Gamma_{402}/\Gamma$ 

VALUE (units $10^{-6}$ )	DOCUMENT ID	TECN	COMMENT
<b><math>5.0 \pm 1.2</math> OUR AVERAGE</b>	Error includes scale factor of 2.3.		
$5.6 \pm 0.5 \pm 0.3$	<sup>1</sup> LEES	11A BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
$2.6^{+1.1}_{-0.9} \pm 0.3$	<sup>1</sup> HUANG	03 BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$7.5 \pm 1.0 \pm 0.7$  <sup>1</sup> AUBERT, BE 06H BABR Repl. by LEES 11A

<sup>1</sup> Assumes equal production of  $B^0$  and  $B^+$  at the  $\Upsilon(4S)$  and for a  $\phi\phi$  invariant mass below  $2.85 \text{ GeV}/c^2$ .

 $\Gamma(\eta' \eta' K^+)/\Gamma_{\text{total}}$   $\Gamma_{403}/\Gamma$ 

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b><math>&lt;25</math></b>	90	<sup>1</sup> AUBERT, B	06P BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

 $\Gamma(\omega \phi K^+)/\Gamma_{\text{total}}$   $\Gamma_{404}/\Gamma$ 

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b><math>&lt;1.9</math></b>	90	<sup>1</sup> LIU	09 BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(X(1812)K^+ \times B(X \rightarrow \omega\phi))/\Gamma_{\text{total}}$   $\Gamma_{405}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;0.32</b>	90	<sup>1</sup> LIU	09 BELL	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(K^*(892)^+\gamma)/\Gamma_{\text{total}}$   $\Gamma_{406}/\Gamma$

VALUE (units $10^{-5}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>4.21±0.18 OUR AVERAGE</b>				
4.22±0.14±0.16		<sup>1</sup> AUBERT	09AO BABR	$e^+e^- \rightarrow \Upsilon(4S)$
4.25±0.31±0.24		<sup>2</sup> NAKAO	04 BELL	$e^+e^- \rightarrow \Upsilon(4S)$
3.76 <sup>+0.89</sup> <sub>-0.83</sub> ±0.28		<sup>2</sup> COAN	00 CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

3.87±0.28±0.26		<sup>3</sup> AUBERT, BE	04A BABR	Repl. by AUBERT 09AO
3.83±0.62±0.22		<sup>2</sup> AUBERT	02C BABR	Repl. by AUBERT, BE 04A
5.7 ±3.1 ±1.1		<sup>4</sup> AMMAR	93 CLE2	Repl. by COAN 00
< 55	90	<sup>5</sup> ALBRECHT	89G ARG	$e^+e^- \rightarrow \Upsilon(4S)$
< 55	90	<sup>5</sup> AVERY	89B CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
<180	90	AVERY	87 CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Uses  $B(\Upsilon(4S) \rightarrow B^+B^-) = (51.6 \pm 0.6)\%$  and  $B(\Upsilon(4S) \rightarrow B^0\bar{B}^0) = (48.4 \pm 0.6)\%$ .

<sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>3</sup> Uses the production ratio of charged and neutral B from  $\Upsilon(4S)$  decays  $R^{+/0} = 1.006 \pm 0.048$ .

<sup>4</sup> AMMAR 93 observed  $4.1 \pm 2.3$  events above background.

<sup>5</sup> Assumes the  $\Upsilon(4S)$  decays 43% to  $B^0\bar{B}^0$ .

$\Gamma(K_1(1270)^+\gamma)/\Gamma_{\text{total}}$   $\Gamma_{407}/\Gamma$

VALUE (units $10^{-5}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>4.3±0.9±0.9</b>		<sup>1</sup> YANG	05 BELL	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

< 9.9	90	<sup>1</sup> NISHIDA	02 BELL	Repl. by YANG 05
<730	90	<sup>2</sup> ALBRECHT	89G ARG	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> ALBRECHT 89G reports  $< 0.0066$  assuming the  $\Upsilon(4S)$  decays 45% to  $B^0\bar{B}^0$ . We rescale to 50%.

$\Gamma(\eta K^+\gamma)/\Gamma_{\text{total}}$   $\Gamma_{408}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>7.9±0.9 OUR AVERAGE</b>				
7.7±1.0±0.4		<sup>1,2</sup> AUBERT	09 BABR	$e^+e^- \rightarrow \Upsilon(4S)$
8.4±1.5 <sup>+1.2</sup> <sub>-0.9</sub>		<sup>2,3</sup> NISHIDA	05 BELL	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

10.0±1.3±0.5		<sup>1,2</sup> AUBERT, B	06M BABR	Repl. by AUBERT 09
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<sup>1</sup>  $m_{\eta K} < 3.25 \text{ GeV}/c^2$ .

<sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>3</sup>  $m_{\eta K} < 2.4 \text{ GeV}/c^2$

$\Gamma(\eta' K^+ \gamma)/\Gamma_{\text{total}}$   $\Gamma_{409}/\Gamma$

VALUE (units $10^{-6}$ )	DOCUMENT ID	TECN	COMMENT
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**$2.9^{+1.0}_{-0.9}$  OUR AVERAGE**

$3.6 \pm 1.2 \pm 0.4$	1,2 WEDD	10	BELL $e^+ e^- \rightarrow \Upsilon(4S)$
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$1.9^{+1.5}_{-1.2} \pm 0.1$	1,3 AUBERT,B	06M	BABR $e^+ e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup>  $m_{\eta' K} < 3.4 \text{ GeV}/c^2$ .

<sup>3</sup> Set the upper limit of  $4.2 \times 10^{-6}$  at 90% CL with  $m_{\eta' K} < 3.25 \text{ GeV}/c^2$ .

$\Gamma(\phi K^+ \gamma)/\Gamma_{\text{total}}$   $\Gamma_{410}/\Gamma$

VALUE (units $10^{-6}$ )	DOCUMENT ID	TECN	COMMENT
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**$2.7 \pm 0.4$  OUR AVERAGE** Error includes scale factor of 1.2.

$2.48 \pm 0.30 \pm 0.24$	<sup>1</sup> SAHOO	11A	BELL $e^+ e^- \rightarrow \Upsilon(4S)$
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$3.5 \pm 0.6 \pm 0.4$	<sup>1</sup> AUBERT	07Q	BABR $e^+ e^- \rightarrow \Upsilon(4S)$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

$3.4 \pm 0.9 \pm 0.4$	<sup>1</sup> DRUTSKOY	04	BELL Repl. by SAHOO 11A
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at  $\Upsilon(4S)$ .

$\Gamma(K^+ \pi^- \pi^+ \gamma)/\Gamma_{\text{total}}$   $\Gamma_{411}/\Gamma$

VALUE (units $10^{-5}$ )	DOCUMENT ID	TECN	COMMENT
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**$2.76 \pm 0.22$  OUR AVERAGE** Error includes scale factor of 1.2.

$2.95 \pm 0.13 \pm 0.20$	<sup>1,2</sup> AUBERT	07R	BABR $e^+ e^- \rightarrow \Upsilon(4S)$
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$2.50 \pm 0.18 \pm 0.22$	<sup>2,3</sup> YANG	05	BELL $e^+ e^- \rightarrow \Upsilon(4S)$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

$2.4 \pm 0.5^{+0.4}_{-0.2}$	<sup>2,4</sup> NISHIDA	02	BELL Repl. by YANG 05
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<sup>1</sup>  $M_{K \pi \pi} < 1.8 \text{ GeV}/c^2$ .

<sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>3</sup>  $M_{K \pi \pi} < 2.0 \text{ GeV}/c^2$ .

<sup>4</sup>  $M_{K \pi \pi} < 2.4 \text{ GeV}/c^2$ .

$\Gamma(K^*(892)^0 \pi^+ \gamma)/\Gamma_{\text{total}}$   $\Gamma_{412}/\Gamma$

VALUE	DOCUMENT ID	TECN	COMMENT
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$(2.0^{+0.7}_{-0.6} \pm 0.2) \times 10^{-5}$	<sup>1,2</sup> NISHIDA	02	BELL $e^+ e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup>  $M_{K \pi \pi} < 2.4 \text{ GeV}/c^2$ .

$\Gamma(K^+ \rho^0 \gamma)/\Gamma_{\text{total}}$   $\Gamma_{413}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
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$< 2.0 \times 10^{-5}$	90	<sup>1,2</sup> NISHIDA	02	BELL $e^+ e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup>  $M_{K \pi \pi} < 2.4 \text{ GeV}/c^2$ .

$\Gamma(K^+\pi^-\pi^+\gamma \text{ nonresonant})/\Gamma_{\text{total}}$   $\Gamma_{414}/\Gamma$ 

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$< 9.2 \times 10^{-6}$	90	1,2 NISHIDA 02	BELL	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .<sup>2</sup>  $M_{K\pi\pi} < 2.4 \text{ GeV}/c^2$ . $\Gamma(K^0\pi^+\pi^0\gamma)/\Gamma_{\text{total}}$   $\Gamma_{415}/\Gamma$ 

VALUE (units $10^{-5}$ )	CL%	DOCUMENT ID	TECN	COMMENT
$4.56 \pm 0.42 \pm 0.31$		1,2 AUBERT 07R	BABR	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup>  $M_{K\pi\pi} < 1.8 \text{ GeV}/c^2$ .<sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ . $\Gamma(K_1(1400)^+\gamma)/\Gamma_{\text{total}}$   $\Gamma_{416}/\Gamma$ 

VALUE (units $10^{-5}$ )	CL%	DOCUMENT ID	TECN	COMMENT
$< 1.5$	90	1 YANG 05	BELL	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$< 5.0$	90	1 NISHIDA 02	BELL	Repl. by YANG 05
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$< 220$	90	2 ALBRECHT 89G	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .<sup>2</sup> ALBRECHT 89G reports  $< 0.0020$  assuming the  $\Upsilon(4S)$  decays 45% to  $B^0\bar{B}^0$ . We rescale to 50%. $\Gamma(K_2^*(1430)^+\gamma)/\Gamma_{\text{total}}$   $\Gamma_{417}/\Gamma$ 

VALUE (units $10^{-5}$ )	CL%	DOCUMENT ID	TECN	COMMENT
$1.45 \pm 0.40 \pm 0.15$		1 AUBERT,B 04U	BABR	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$< 140$	90	2 ALBRECHT 89G	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .<sup>2</sup> ALBRECHT 89G reports  $< 0.0013$  assuming the  $\Upsilon(4S)$  decays 45% to  $B^0\bar{B}^0$ . We rescale to 50%. $\Gamma(K^*(1680)^+\gamma)/\Gamma_{\text{total}}$   $\Gamma_{418}/\Gamma$ 

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$< 0.0019$	90	1 ALBRECHT 89G	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> ALBRECHT 89G reports  $< 0.0017$  assuming the  $\Upsilon(4S)$  decays 45% to  $B^0\bar{B}^0$ . We rescale to 50%. $\Gamma(K_3^*(1780)^+\gamma)/\Gamma_{\text{total}}$   $\Gamma_{419}/\Gamma$ 

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
$< 39$	90	1,2 NISHIDA 05	BELL	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$< 5500$	90	3 ALBRECHT 89G	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .<sup>2</sup> Uses  $B(K_3^*(1780) \rightarrow \eta K) = 0.11^{+0.05}_{-0.04}$ .<sup>3</sup> ALBRECHT 89G reports  $< 0.005$  assuming the  $\Upsilon(4S)$  decays 45% to  $B^0\bar{B}^0$ . We rescale to 50%.



$\Gamma(K_4^*(2045)^+\gamma)/\Gamma_{\text{total}}$   $\Gamma_{420}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0099	90	<sup>1</sup> ALBRECHT 89G	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> ALBRECHT 89G reports < 0.0090 assuming the  $\Upsilon(4S)$  decays 45% to  $B^0\bar{B}^0$ . We rescale to 50%.

$\Gamma(\rho^+\gamma)/\Gamma_{\text{total}}$   $\Gamma_{421}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>0.98 ± 0.25 OUR AVERAGE</b>				
$1.20^{+0.42}_{-0.37} \pm 0.20$		<sup>1</sup> AUBERT 08BH	BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$0.87^{+0.29}_{-0.27} \pm 0.09$		<sup>1</sup> TANIGUCHI 08	BELL	$e^+e^- \rightarrow \Upsilon(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
$1.10^{+0.37}_{-0.33} \pm 0.09$		<sup>1</sup> AUBERT 07L	BABR	Repl. by AUBERT 08BH
$0.55^{+0.42}_{-0.36} \pm 0.09$		<sup>1</sup> MOHAPATRA 06	BELL	Repl. by TANIGUCHI 08
$0.9^{+0.6}_{-0.5} \pm 0.1$	90	<sup>1</sup> AUBERT 05	BABR	Repl. by AUBERT 07L
< 2.2	90	<sup>1</sup> MOHAPATRA 05	BELL	$e^+e^- \rightarrow \Upsilon(4S)$
< 2.1	90	<sup>1</sup> AUBERT 04C	BABR	$e^+e^- \rightarrow \Upsilon(4S)$
< 13	90	<sup>1,2</sup> COAN 00	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at  $\Upsilon(4S)$ .

<sup>2</sup> No evidence for a nonresonant  $K\pi\gamma$  contamination was seen; the central value assumes no contamination.

$\Gamma(\pi^+\pi^0)/\Gamma_{\text{total}}$   $\Gamma_{422}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>5.5 ± 0.4 OUR AVERAGE</b>				Error includes scale factor of 1.2.
$5.86 \pm 0.26 \pm 0.38$		<sup>1</sup> DUH 13	BELL	$e^+e^- \rightarrow \Upsilon(4S)$
$5.02 \pm 0.46 \pm 0.29$		<sup>1</sup> AUBERT 07BC	BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$4.6^{+1.8}_{-1.6} \pm 0.6$		<sup>1</sup> BORNHEIM 03	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
$6.5 \pm 0.4 \pm 0.4$		<sup>1</sup> LIN 07A	BELL	Repl. by DUH 13
$5.8 \pm 0.6 \pm 0.4$		<sup>1</sup> AUBERT 05L	BABR	Repl. by AUBERT 07BC
$5.0 \pm 1.2 \pm 0.5$		<sup>1</sup> CHAO 04	BELL	Repl. by LIN 07A
$5.5^{+1.0}_{-1.9} \pm 0.6$		<sup>1</sup> AUBERT 03L	BABR	Repl. by AUBERT 05L
$7.4^{+2.3}_{-2.2} \pm 0.9$		<sup>1</sup> CASEY 02	BELL	Repl. by CHAO 04
< 13.4	90	<sup>1</sup> ABE 01H	BELL	$e^+e^- \rightarrow \Upsilon(4S)$
< 9.6	90	<sup>1</sup> AUBERT 01E	BABR	$e^+e^- \rightarrow \Upsilon(4S)$
< 12.7	90	<sup>1</sup> CRONIN-HEN. 00	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
< 20	90	GODANG 98	CLE2	Repl. by CRONIN-HENNESSY 00
< 17	90	ASNER 96	CLE2	Repl. by GODANG 98
< 240	90	<sup>1</sup> ALBRECHT 90B	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
< 2300	90	<sup>2</sup> BEBEK 87	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> BEBEK 87 assume the  $\Upsilon(4S)$  decays 43% to  $B^0\bar{B}^0$ .

$\Gamma(\pi^+\pi^0)/\Gamma(K^0\pi^+)$   $\Gamma_{422}/\Gamma_{305}$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.285±0.02±0.02</b>	LIN	07A	BELL $e^+e^- \rightarrow \Upsilon(4S)$

$\Gamma(\pi^+\pi^+\pi^-)/\Gamma_{total}$   $\Gamma_{423}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>15.2±0.6<sup>+1.3</sup><sub>-1.2</sub></b>		<sup>1</sup> AUBERT	09L	BABR $e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

16.2±1.2±0.9		<sup>1</sup> AUBERT,B	05G	BABR Repl. by AUBERT 09L
10.9±3.3±1.6		<sup>1</sup> AUBERT	03M	BABR Repl. by AUBERT 05G
<130	90	<sup>2</sup> ADAM	96D	DLPH $e^+e^- \rightarrow Z$
<220	90	<sup>3</sup> ABREU	95N	DLPH Sup. by ADAM 96D
<450	90	<sup>4</sup> ALBRECHT	90B	ARG $e^+e^- \rightarrow \Upsilon(4S)$
<190	90	<sup>5</sup> BORTOLETTO89	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^0$  and  $B^+$  at the  $\Upsilon(4S)$ ; charm and charmonium contributions are subtracted, otherwise no assumptions about intermediate resonances.

<sup>2</sup> ADAM 96D assumes  $f_{B^0} = f_{B^-} = 0.39$  and  $f_{B_s} = 0.12$ .

<sup>3</sup> Assumes a  $B^0, B^-$  production fraction of 0.39 and a  $B_s$  production fraction of 0.12.

<sup>4</sup> ALBRECHT 90B limit assumes equal production of  $B^0\bar{B}^0$  and  $B^+B^-$  at  $\Upsilon(4S)$ .

<sup>5</sup> BORTOLETTO 89 reports  $< 1.7 \times 10^{-4}$  assuming the  $\Upsilon(4S)$  decays 43% to  $B^0\bar{B}^0$ . We rescale to 50%.

$\Gamma(\rho^0\pi^+)/\Gamma_{total}$   $\Gamma_{424}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>8.3±1.2 OUR AVERAGE</b>				
8.1±0.7 <sup>+1.3</sup> <sub>-1.6</sub>		<sup>1</sup> AUBERT	09L	BABR $e^+e^- \rightarrow \Upsilon(4S)$
8.0 <sup>+2.3</sup> <sub>-2.0</sub> ±0.7		<sup>1</sup> GORDON	02	BELL $e^+e^- \rightarrow \Upsilon(4S)$
10.4 <sup>+3.3</sup> <sub>-3.4</sub> ±2.1		<sup>1</sup> JESSOP	00	CLE2 $e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

8.8±1.0 <sup>+0.6</sup> <sub>-0.9</sub>		<sup>1</sup> AUBERT,B	05G	BABR Repl. by AUBERT 09L
9.5±1.1±0.9		<sup>1</sup> AUBERT	04Z	BABR Repl. by AUBERT 05G
< 83	90	<sup>2</sup> ABE	00C	SLD $e^+e^- \rightarrow Z$
<160	90	<sup>3</sup> ADAM	96D	DLPH $e^+e^- \rightarrow Z$
< 43	90	ASNER	96	CLE2 Repl. by JESSOP 00
<260	90	<sup>4</sup> ABREU	95N	DLPH Sup. by ADAM 96D
<150	90	<sup>1</sup> ALBRECHT	90B	ARG $e^+e^- \rightarrow \Upsilon(4S)$
<170	90	<sup>5</sup> BORTOLETTO89	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
<230	90	<sup>5</sup> BEBEK	87	CLEO $e^+e^- \rightarrow \Upsilon(4S)$
<600	90	GILES	84	CLEO Repl. by BEBEK 87

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> ABE 00C assumes  $B(Z \rightarrow b\bar{b}) = (21.7 \pm 0.1)\%$  and the  $B$  fractions  $f_{B^0} = f_{B^+} = (39.7^{+1.8}_{-2.2})\%$  and  $f_{B_s} = (10.5^{+1.8}_{-2.2})\%$ .

<sup>3</sup> ADAM 96D assumes  $f_{B^0} = f_{B^-} = 0.39$  and  $f_{B_s} = 0.12$ .

<sup>4</sup> Assumes a  $B^0, B^-$  production fraction of 0.39 and a  $B_s$  production fraction of 0.12.

<sup>5</sup> Papers assume the  $\Upsilon(4S)$  decays 43% to  $B^0\bar{B}^0$ . We rescale to 50%.

$[\Gamma(K^*(892)^0 \pi^+) + \Gamma(\rho^0 \pi^+)]/\Gamma_{\text{total}} \quad (\Gamma_{331} + \Gamma_{424})/\Gamma$

VALUE (units $10^{-6}$ )	DOCUMENT ID	TECN	COMMENT
$170_{-80}^{+120} \pm 20$	<sup>1</sup> ADAM	96D	DLPH $e^+ e^- \rightarrow Z$

<sup>1</sup> ADAM 96D assumes  $f_{B^0} = f_{B^-} = 0.39$  and  $f_{B_s} = 0.12$ .

$\Gamma(\pi^+ f_0(980), f_0 \rightarrow \pi^+ \pi^-)/\Gamma_{\text{total}} \quad \Gamma_{425}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
< 1.5	90	<sup>1</sup> AUBERT	09L	BABR $e^+ e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
< 3.0	90	<sup>1</sup> AUBERT,B	05G	BABR Repl. by AUBERT 09L
< 140	90	<sup>2</sup> BORTOLETTO89	CLEO	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> BORTOLETTO 89 reports  $< 1.2 \times 10^{-4}$  assuming the  $\Upsilon(4S)$  decays 43% to  $B^0 \bar{B}^0$ . We rescale to 50%.

$\Gamma(\pi^+ f_2(1270))/\Gamma_{\text{total}} \quad \Gamma_{426}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
$1.60_{-0.44}^{+0.67} + 0.02_{-0.06}$		<sup>1,2</sup> AUBERT	09L	BABR $e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$4.10 \pm 1.28_{-0.14}^{+0.04}$		<sup>2,3</sup> AUBERT,B	05G	BABR Repl. by AUBERT 09L
< 240	90	<sup>4</sup> BORTOLETTO89	CLEO	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> AUBERT 09L reports  $[\Gamma(B^+ \rightarrow \pi^+ f_2(1270))/\Gamma_{\text{total}}] \times [B(f_2(1270) \rightarrow \pi^+ \pi^-)] = (0.9 \pm 0.2 \pm 0.1_{-0.1}^{+0.3}) \times 10^{-6}$  which we divide by our best value  $B(f_2(1270) \rightarrow \pi^+ \pi^-) = (56.2_{-0.6}^{+1.9}) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>3</sup> AUBERT,B 05G reports  $[\Gamma(B^+ \rightarrow \pi^+ f_2(1270))/\Gamma_{\text{total}}] \times [B(f_2(1270) \rightarrow \pi^+ \pi^-)] = (2.3 \pm 0.6 \pm 0.4) \times 10^{-6}$  which we divide by our best value  $B(f_2(1270) \rightarrow \pi^+ \pi^-) = (56.2_{-0.6}^{+1.9}) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>4</sup> BORTOLETTO 89 reports  $< 2.1 \times 10^{-4}$  assuming the  $\Upsilon(4S)$  decays 43% to  $B^0 \bar{B}^0$ . We rescale to 50%.

$\Gamma(\rho(1450)^0 \pi^+, \rho^0 \rightarrow \pi^+ \pi^-)/\Gamma_{\text{total}} \quad \Gamma_{427}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
$1.4 \pm 0.4_{-0.8}^{+0.5}$		<sup>1</sup> AUBERT	09L	BABR $e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

< 2.3	90	<sup>1</sup> AUBERT,B	05G	BABR Repl. by AUBERT 09L
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(f_0(1370)\pi^+, f_0 \rightarrow \pi^+\pi^-)/\Gamma_{\text{total}}$   $\Gamma_{428}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
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<b>&lt;4.0</b>	90	<sup>1</sup> AUBERT	09L BABR	$e^+e^- \rightarrow \gamma(4S)$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

<3.0	90	<sup>1</sup> AUBERT,B	05G BABR	Repl. by AUBERT 09L
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\gamma(4S)$ .

$\Gamma(f_0(500)\pi^+, f_0 \rightarrow \pi^+\pi^-)/\Gamma_{\text{total}}$   $\Gamma_{429}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
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<b>&lt;4.1</b>	90	<sup>1</sup> AUBERT,B	05G BABR	$e^+e^- \rightarrow \gamma(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\gamma(4S)$ .

$\Gamma(\pi^+\pi^-\pi^+\text{ nonresonant})/\Gamma_{\text{total}}$   $\Gamma_{430}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
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<b><math>5.3 \pm 0.7^{+1.3}_{-0.8}</math></b>		<sup>1</sup> AUBERT	09L BABR	$e^+e^- \rightarrow \gamma(4S)$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

< 4.6	90	<sup>1</sup> AUBERT,B	05G BABR	Repl. by AUBERT 09L
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<41	90	BERGFELD	96B CLE2	$e^+e^- \rightarrow \gamma(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\gamma(4S)$ .

$\Gamma(\pi^+\pi^0\pi^0)/\Gamma_{\text{total}}$   $\Gamma_{431}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
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<b>&lt;8.9 <math>\times 10^{-4}</math></b>	90	<sup>1</sup> ALBRECHT	90B ARG	$e^+e^- \rightarrow \gamma(4S)$
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<sup>1</sup> ALBRECHT 90B limit assumes equal production of  $B^0\bar{B}^0$  and  $B^+B^-$  at  $\gamma(4S)$ .

$\Gamma(\rho^+\pi^0)/\Gamma_{\text{total}}$   $\Gamma_{432}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
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**10.9  $\pm$  1.4 OUR AVERAGE**

10.2 $\pm$ 1.4 $\pm$ 0.9		<sup>1</sup> AUBERT	07X BABR	$e^+e^- \rightarrow \gamma(4S)$
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13.2 $\pm$ 2.3 $^{+1.4}_{-1.9}$		<sup>1</sup> ZHANG	05A BELL	$e^+e^- \rightarrow \gamma(4S)$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

10.9 $\pm$ 1.9 $\pm$ 1.9		<sup>1</sup> AUBERT	04Z BABR	Repl. by AUBERT 07X
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< 43	90	<sup>1,2</sup> JESSOP	00 CLE2	$e^+e^- \rightarrow \gamma(4S)$
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< 77	90	ASNER	96 CLE2	Repl. by JESSOP 00
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<550	90	<sup>1</sup> ALBRECHT	90B ARG	$e^+e^- \rightarrow \gamma(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\gamma(4S)$ .

<sup>2</sup> Assumes no nonresonant contributions of  $B^+ \rightarrow \pi^+\pi^0\pi^0$ .

$\Gamma(\pi^+\pi^-\pi^+\pi^0)/\Gamma_{\text{total}}$   $\Gamma_{433}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
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<b>&lt;4.0 <math>\times 10^{-3}</math></b>	90	<sup>1</sup> ALBRECHT	90B ARG	$e^+e^- \rightarrow \gamma(4S)$
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<sup>1</sup> ALBRECHT 90B limit assumes equal production of  $B^0\bar{B}^0$  and  $B^+B^-$  at  $\gamma(4S)$ .

$\Gamma(\rho^+ \rho^0)/\Gamma_{\text{total}}$   $\Gamma_{434}/\Gamma$ 

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
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**24.0 ± 1.9 OUR AVERAGE**

23.7 ± 1.4 ± 1.4		<sup>1</sup> AUBERT	09G BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
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31.7 ± 7.1 <sup>+3.8</sup> <sub>-6.7</sub>		<sup>1,2</sup> ZHANG	03B BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

16.8 ± 2.2 ± 2.3		<sup>1</sup> AUBERT, BE	06G BABR	Repl. by AUBERT 09G
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22.5 <sup>+5.7</sup> <sub>-5.4</sub> ± 5.8		<sup>1</sup> AUBERT	03V BABR	Repl. by AUBERT, BE 06G
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< 1000	90	<sup>1</sup> ALBRECHT	90B ARG	$e^+ e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> The systematic error includes the error associated with the helicity-mix uncertainty.

 $\Gamma(\rho^+ f_0(980), f_0 \rightarrow \pi^+ \pi^-)/\Gamma_{\text{total}}$   $\Gamma_{435}/\Gamma$ 

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
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< 2.0	90	<sup>1</sup> AUBERT	09G BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

< 1.9	90	<sup>1</sup> AUBERT, BE	06G BABR	Repl. by AUBERT 09G
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

 $\Gamma(a_1(1260)^+ \pi^0)/\Gamma_{\text{total}}$   $\Gamma_{436}/\Gamma$ 

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
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<b>26.4 ± 5.4 ± 4.1</b>		<sup>1,2</sup> AUBERT	07BL BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

< 1700	90	<sup>1</sup> ALBRECHT	90B ARG	$e^+ e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> Assumes  $a_1^+$  decays only to  $3\pi$  and  $B(a_1^+ \rightarrow \pi^\pm \pi^\mp \pi^+) = 0.5$ .

 $\Gamma(a_1(1260)^0 \pi^+)/\Gamma_{\text{total}}$   $\Gamma_{437}/\Gamma$ 

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
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<b>20.4 ± 4.7 ± 3.4</b>		<sup>1,2</sup> AUBERT	07BL BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

< 900	90	<sup>1</sup> ALBRECHT	90B ARG	$e^+ e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> Assumes  $a_1^0$  decays only to  $3\pi$  and  $B(a_1^+ \rightarrow \pi^\pm \pi^\mp \pi^0) = 1.0$ .

 $\Gamma(\omega \pi^+)/\Gamma_{\text{total}}$   $\Gamma_{438}/\Gamma$ 

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
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**6.9 ± 0.5 OUR AVERAGE**

6.7 ± 0.5 ± 0.4		<sup>1</sup> AUBERT	07AE BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
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6.9 ± 0.6 ± 0.5		<sup>1</sup> JEN	06 BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
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11.3 <sup>+3.3</sup> <sub>-2.9</sub> ± 1.4		<sup>1</sup> JESSOP	00 CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

$6.1 \pm 0.7 \pm 0.4$		<sup>1</sup> AUBERT,B	06E	BABR	Repl. by AUBERT 07AE
$5.5 \pm 0.9 \pm 0.5$		<sup>1</sup> AUBERT	04H	BABR	Repl. by AUBERT,B 06E
$5.7^{+1.4}_{-1.3} \pm 0.6$		<sup>1</sup> WANG	04A	BELL	Repl. by JEN 06
$4.2^{+2.0}_{-1.8} \pm 0.5$		<sup>1</sup> LU	02	BELL	Repl. by WANG 04A
$6.6^{+2.1}_{-1.8} \pm 0.7$		<sup>1</sup> AUBERT	01G	BABR	Repl. by AUBERT 04H
< 23	90	<sup>1</sup> BERGFELD	98	CLE2	Repl. by JESSOP 00
<400	90	<sup>1</sup> ALBRECHT	90B	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\omega\rho^+)/\Gamma_{\text{total}}$   $\Gamma_{439}/\Gamma$

<u>VALUE (units <math>10^{-6}</math>)</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>15.9±1.6±1.4</b>		<sup>1</sup> AUBERT	09H	BABR $e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$10.6 \pm 2.1^{+1.6}_{-1.0}$		<sup>1</sup> AUBERT,B	06T	BABR	Repl. by AUBERT 09H
$12.6^{+3.7}_{-3.3} \pm 1.6$		<sup>1</sup> AUBERT	050	BABR	Repl. by AUBERT,B 06T
<61	90	<sup>1</sup> BERGFELD	98	CLE2	

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\eta\pi^+)/\Gamma_{\text{total}}$   $\Gamma_{440}/\Gamma$

<u>VALUE (units <math>10^{-6}</math>)</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>4.02±0.27 OUR AVERAGE</b>				
$4.07 \pm 0.26 \pm 0.21$		<sup>1</sup> HOI	12	BELL $e^+e^- \rightarrow \Upsilon(4S)$
$4.00 \pm 0.40 \pm 0.24$		<sup>1</sup> AUBERT	09AV	BABR $e^+e^- \rightarrow \Upsilon(4S)$
$1.2^{+2.8}_{-1.2}$		<sup>1</sup> RICHICHI	00	CLE2 $e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$5.0 \pm 0.5 \pm 0.3$		<sup>1</sup> AUBERT	07AE	BABR	Repl. by AUBERT 09AV
$4.2 \pm 0.4 \pm 0.2$		<sup>1</sup> CHANG	07B	BELL	Repl. by HOI 12
$5.1 \pm 0.6 \pm 0.3$		<sup>1</sup> AUBERT,B	05K	BABR	Repl. by AUBERT 07AE
$4.8 \pm 0.7 \pm 0.3$		<sup>1</sup> CHANG	05A	BELL	Repl. by CHANG 07B
$5.3 \pm 1.0 \pm 0.3$		<sup>1</sup> AUBERT	04H	BABR	Repl. by AUBERT,B 05K
< 15	90	BEHRENS	98	CLE2	Repl. by RICHICHI 00
<700	90	<sup>1</sup> ALBRECHT	90B	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\eta\rho^+)/\Gamma_{\text{total}}$   $\Gamma_{441}/\Gamma$

<u>VALUE (units <math>10^{-6}</math>)</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>7.0±2.9 OUR AVERAGE</b>		Error includes scale factor of 2.8.		
$9.9 \pm 1.2 \pm 0.8$		<sup>1</sup> AUBERT	08AH	BABR $e^+e^- \rightarrow \Upsilon(4S)$
$4.1^{+1.4}_{-1.3} \pm 0.4$		<sup>1</sup> WANG	07B	BELL $e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$8.4 \pm 1.9 \pm 1.1$		<sup>1</sup> AUBERT,B	05K	BABR	Repl. by AUBERT 08AH
<14	90	<sup>1</sup> AUBERT,B	04D	BABR	Repl. by AUBERT,B 05K
<15	90	<sup>1</sup> RICHICHI	00	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
<32	90	BEHRENS	98	CLE2	Repl. by RICHICHI 00

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\eta' \pi^+)/\Gamma_{\text{total}}$   $\Gamma_{442}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b><math>2.7 \pm 0.9</math></b>	<b>OUR AVERAGE</b>	Error includes scale factor of 1.9.		
$3.5 \pm 0.6 \pm 0.2$		<sup>1</sup> AUBERT	09AV	BABR $e^+e^- \rightarrow \Upsilon(4S)$
$1.76^{+0.67+0.15}_{-0.62-0.14}$		<sup>1</sup> SCHUEMANN	06	BELL $e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$3.9 \pm 0.7 \pm 0.3$		<sup>1</sup> AUBERT	07AE	BABR	Repl. by AUBERT 09AV
$4.0 \pm 0.8 \pm 0.4$		<sup>1</sup> AUBERT,B	05K	BABR	Repl. by AUBERT 07AE
< 4.5	90	<sup>1</sup> AUBERT	04H	BABR	Repl. by AUBERT,B 05K
< 7.0	90	<sup>1</sup> ABE	01M	BELL	$e^+e^- \rightarrow \Upsilon(4S)$
<12	90	<sup>1</sup> AUBERT	01G	BABR	$e^+e^- \rightarrow \Upsilon(4S)$
<12	90	<sup>1</sup> RICHICHI	00	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
<31	90	BEHRENS	98	CLE2	Repl. by RICHICHI 00

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\eta' \rho^+)/\Gamma_{\text{total}}$   $\Gamma_{443}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b><math>9.7^{+1.9}_{-1.8} \pm 1.1</math></b>		<sup>1</sup> DEL-AMO-SA..10A	BABR	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$8.7^{+3.1+2.3}_{-2.8-1.3}$		<sup>1</sup> AUBERT	07E	BABR	Repl. by DEL-AMO-SANCHEZ 10A
< 5.8	90	<sup>1</sup> SCHUEMANN	07	BELL	$e^+e^- \rightarrow \Upsilon(4S)$
<22	90	<sup>1</sup> AUBERT,B	04D	BABR	Repl. by AUBERT 07E
<33	90	<sup>1</sup> RICHICHI	00	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
<47	90	BEHRENS	98	CLE2	Repl. by RICHICHI 00

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\phi \pi^+)/\Gamma_{\text{total}}$   $\Gamma_{444}/\Gamma$

VALUE (units $10^{-7}$ )	CL%	DOCUMENT ID	TECN	COMMENT
< <b>1.5</b>	90	<sup>1</sup> AAIJ	14A	LHCB $pp$ at 7 TeV

• • • We do not use the following data for averages, fits, limits, etc. • • •

< 3.3	90	<sup>2</sup> KIM	12A	BELL	$e^+e^- \rightarrow \Upsilon(4S)$
< 2.4	90	<sup>2</sup> AUBERT,B	06C	BABR	$e^+e^- \rightarrow \Upsilon(4S)$
< 4.1	90	<sup>2</sup> AUBERT	04A	BABR	Repl. by AUBERT,B 06C
< 14	90	<sup>2</sup> AUBERT	01D	BABR	$e^+e^- \rightarrow \Upsilon(4S)$
<1530	90	<sup>3</sup> ABE	00C	SLD	$e^+e^- \rightarrow Z$
< 50	90	<sup>2</sup> BERGFELD	98	CLE2	

<sup>1</sup> Measures  $B(B^+ \rightarrow \phi\pi^+)/B(B^+ \rightarrow \phi K^+) < 0.018$  at 90% C.L. and assumes  $B(B^+ \rightarrow \phi K^+) = (8.8^{+0.7}_{-0.6}) \times 10^{-6}$ .

<sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>3</sup> ABE 00C assumes  $B(Z \rightarrow b\bar{b}) = (21.7 \pm 0.1)\%$  and the  $B$  fractions  $f_{B^0} = f_{B^+} = (39.7^{+1.8}_{-2.2})\%$  and  $f_{B_s} = (10.5^{+1.8}_{-2.2})\%$ .

**$\Gamma(\phi\rho^+)/\Gamma_{\text{total}}$   $\Gamma_{445}/\Gamma$**

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
< 3.0	90	<sup>1</sup> AUBERT	08BK BABR	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

<16 <sup>1</sup> BERGFELD 98 CLE2

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

**$\Gamma(a_0(980)^0\pi^+, a_0^0 \rightarrow \eta\pi^0)/\Gamma_{\text{total}}$   $\Gamma_{446}/\Gamma$**

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<5.8	90	<sup>1</sup> AUBERT, BE	04 BABR	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of charged and neutral  $B$  mesons from  $\Upsilon(4S)$  decays.

**$\Gamma(a_0(980)^+\pi^0, a_0^+ \rightarrow \eta\pi^+)/\Gamma_{\text{total}}$   $\Gamma_{447}/\Gamma$**

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<1.4	90	<sup>1</sup> AUBERT	08A BABR	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

**$\Gamma(\pi^+\pi^+\pi^+\pi^-\pi^-)/\Gamma_{\text{total}}$   $\Gamma_{448}/\Gamma$**

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<8.6 $\times 10^{-4}$	90	<sup>1</sup> ALBRECHT	90B ARG	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> ALBRECHT 90B limit assumes equal production of  $B^0\bar{B}^0$  and  $B^+B^-$  at  $\Upsilon(4S)$ .

**$\Gamma(\rho^0 a_1(1260)^+)/\Gamma_{\text{total}}$   $\Gamma_{449}/\Gamma$**

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<6.2 $\times 10^{-4}$	90	<sup>1</sup> BORTOLETTO89	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

<6.0  $\times 10^{-4}$  <sup>2</sup> ALBRECHT 90B ARG  $e^+e^- \rightarrow \Upsilon(4S)$

<3.2  $\times 10^{-3}$  <sup>1</sup> BEBEK 87 CLEO  $e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> BORTOLETTO 89 reports  $< 5.4 \times 10^{-4}$  assuming the  $\Upsilon(4S)$  decays 43% to  $B^0\bar{B}^0$ . We rescale to 50%.

<sup>2</sup> ALBRECHT 90B limit assumes equal production of  $B^0\bar{B}^0$  and  $B^+B^-$  at  $\Upsilon(4S)$ .

**$\Gamma(\rho^0 a_2(1320)^+)/\Gamma_{\text{total}}$   $\Gamma_{450}/\Gamma$**

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<7.2 $\times 10^{-4}$	90	<sup>1</sup> BORTOLETTO89	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

<2.6  $\times 10^{-3}$  <sup>2</sup> BEBEK 87 CLEO  $e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> BORTOLETTO 89 reports  $< 6.3 \times 10^{-4}$  assuming the  $\Upsilon(4S)$  decays 43% to  $B^0\bar{B}^0$ . We rescale to 50%.

<sup>2</sup> BEBEK 87 reports  $< 2.3 \times 10^{-3}$  assuming the  $\Upsilon(4S)$  decays 43% to  $B^0\bar{B}^0$ . We rescale to 50%.



$\Gamma(b_1^0 \pi^+, b_1^0 \rightarrow \omega \pi^0)/\Gamma_{\text{total}}$   $\Gamma_{451}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b><math>6.7 \pm 1.7 \pm 1.0</math></b>		<sup>1</sup> AUBERT	07BI BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(b_1^+ \pi^0, b_1^+ \rightarrow \omega \pi^+)/\Gamma_{\text{total}}$   $\Gamma_{452}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b><math>&lt; 3.3</math></b>	90	<sup>1</sup> AUBERT	08AG BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^0)/\Gamma_{\text{total}}$   $\Gamma_{453}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b><math>&lt; 6.3 \times 10^{-3}</math></b>	90	<sup>1</sup> ALBRECHT	90B ARG	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> ALBRECHT 90B limit assumes equal production of  $B^0 \bar{B}^0$  and  $B^+ B^-$  at  $\Upsilon(4S)$ .

$\Gamma(b_1^+ \rho^0, b_1^+ \rightarrow \omega \pi^+)/\Gamma_{\text{total}}$   $\Gamma_{454}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b><math>&lt; 5.2 \times 10^{-6}</math></b>	90	<sup>1</sup> AUBERT	09AF BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(b_1^0 \rho^+, b_1^0 \rightarrow \omega \pi^0)/\Gamma_{\text{total}}$   $\Gamma_{456}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b><math>&lt; 3.3 \times 10^{-6}</math></b>	90	<sup>1</sup> AUBERT	09AF BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(a_1(1260)^+ a_1(1260)^0)/\Gamma_{\text{total}}$   $\Gamma_{455}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b><math>&lt; 1.3 \times 10^{-2}</math></b>	90	<sup>1</sup> ALBRECHT	90B ARG	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> ALBRECHT 90B limit assumes equal production of  $B^0 \bar{B}^0$  and  $B^+ B^-$  at  $\Upsilon(4S)$ .

$\Gamma(h^+ \pi^0)/\Gamma_{\text{total}}$   $\Gamma_{457}/\Gamma$

$h^+ = K^+ \text{ or } \pi^+$

VALUE (units $10^{-6}$ )	DOCUMENT ID	TECN	COMMENT
<b><math>16^{+6}_{-5} \pm 3.6</math></b>	GODANG	98 CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$

$\Gamma(\omega h^+)/\Gamma_{\text{total}}$   $\Gamma_{458}/\Gamma$

$h^+ = K^+ \text{ or } \pi^+$

VALUE (units $10^{-6}$ )	DOCUMENT ID	TECN	COMMENT
<b><math>13.8^{+2.7}_{-2.4}</math> OUR AVERAGE</b>			

$13.4^{+3.3}_{-2.9} \pm 1.1$  <sup>1</sup> LU 02 BELL  $e^+ e^- \rightarrow \Upsilon(4S)$

$14.3^{+3.6}_{-3.2} \pm 2.0$  <sup>1</sup> JESSOP 00 CLE2  $e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$25^{+8}_{-7} \pm 3$  <sup>1</sup> BERGFELD 98 CLE2 Repl. by JESSOP 00

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(h^+ X^0(\text{Familon}))/\Gamma_{\text{total}}$   $\Gamma_{459}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;49</b>	90	<sup>1</sup> AMMAR	01B CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> AMMAR 01B searched for the two-body decay of the  $B$  meson to a massless neutral feebly-interacting particle  $X^0$  such as the familon, the Nambu-Goldstone boson associated with a spontaneously broken global family symmetry.

$\Gamma(p\bar{p}\pi^+)/\Gamma_{\text{total}}$   $\Gamma_{460}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>1.62 ± 0.20 OUR AVERAGE</b>				

1.60 <sup>+</sup> <sub>-</sub>	0.22 ± 0.19	0.12	<sup>1,2,3</sup> WEI	08 BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
1.69 ±	0.29 ±	0.26	<sup>1</sup> AUBERT	07AV BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●					
1.07 ±	0.11 ±	0.11	<sup>4</sup> AAIJ	14AF LHCb	$pp$ at 7, 8 TeV
3.06 <sup>+</sup> <sub>-</sub>	0.73 ± 0.62	0.37	<sup>1,3</sup> WANG	04 BELL	Repl. by WEI 08
< 3.7		90	<sup>1,2</sup> ABE	02K BELL	Repl. by WANG 04
<500		90	<sup>5</sup> ABREU	95N DLPH	Repl. by ADAM 96D
<160		90	<sup>6</sup> BEBEK	89 CLEO	$e^+ e^- \rightarrow \Upsilon(4S)$
570 ±150 ±210			<sup>7</sup> ALBRECHT	88F ARG	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .  
<sup>2</sup> Explicitly vetoes resonant production of  $p\bar{p}$  from Charmonium states.  
<sup>3</sup> Also provides results with  $m_{p\bar{p}} < 2.85 \text{ GeV}/c^2$  and angular asymmetry of  $p\bar{p}$  system.  
<sup>4</sup> Requires  $m_{p\bar{p}} < 2.85 \text{ GeV}/c^2$ .  
<sup>5</sup> Assumes a  $B^0, B^-$  production fraction of 0.39 and a  $B_s$  production fraction of 0.12.  
<sup>6</sup> BEBEK 89 reports  $< 1.4 \times 10^{-4}$  assuming the  $\Upsilon(4S)$  decays 43% to  $B^0 \bar{B}^0$ . We rescale to 50%.  
<sup>7</sup> ALBRECHT 88F reports  $(5.2 \pm 1.4 \pm 1.9) \times 10^{-4}$  assuming the  $\Upsilon(4S)$  decays 45% to  $B^0 \bar{B}^0$ . We rescale to 50%.

$\Gamma(p\bar{p}\pi^+ \text{nonresonant})/\Gamma_{\text{total}}$   $\Gamma_{461}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;53</b>	90	BERGFELD	96B CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$

$\Gamma(p\bar{p}\pi^+ \pi^+ \pi^-)/\Gamma_{\text{total}}$   $\Gamma_{462}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				

$< 5.2 \times 10^{-4}$	90	<sup>1</sup> ALBRECHT	88F ARG	$e^+ e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> ALBRECHT 88F reports  $< 4.7 \times 10^{-4}$  assuming the  $\Upsilon(4S)$  decays 45% to  $B^0 \bar{B}^0$ . We rescale to 50%.

$\Gamma(p\bar{p}K^+)/\Gamma_{\text{total}}$   $\Gamma_{463}/\Gamma$

VALUE (units $10^{-6}$ )	DOCUMENT ID	TECN	COMMENT
<b>5.9 ± 0.5 OUR AVERAGE</b>	Error includes scale factor of 1.5.		
5.54 <sup>+0.27</sup> <sub>-0.25</sub> ± 0.36	<sup>1,2,3</sup> WEI	08 BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
6.7 ± 0.5 ± 0.4	<sup>1,3</sup> AUBERT,B	05L BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$4.59^{+0.38}_{-0.34} \pm 0.50$	1,2,3 WANG	05A BELL	Repl. by WEI 08
$5.66^{+0.67}_{-0.57} \pm 0.62$	1,2,3 WANG	04 BELL	Repl. by WANG 05A
$4.3^{+1.1}_{-0.9} \pm 0.5$	1,2 ABE	02K BELL	Repl. by WANG 04

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> Explicitly vetoes resonant production of  $p\bar{p}$  from Charmonium states.

<sup>3</sup> Provides also results with  $m_{p\bar{p}} < 2.85 \text{ GeV}/c^2$  and angular asymmetry of  $p\bar{p}$  system.

### $\Gamma(p\bar{p}K^+)/\Gamma(J/\psi(1S)K^+)$

$\Gamma_{463}/\Gamma_{255}$

VALUE	DOCUMENT ID	TECN	COMMENT
<b><math>0.0104 \pm 0.0005 \pm 0.0001</math></b>	1,2 AAIJ	13S LHCb	$pp$ at 7 TeV

<sup>1</sup> AAIJ 13S reports  $[\Gamma(B^+ \rightarrow p\bar{p}K^+)/\Gamma(B^+ \rightarrow J/\psi(1S)K^+)] / [B(J/\psi(1S) \rightarrow p\bar{p})] = 4.91 \pm 0.19 \pm 0.14$  which we multiply by our best value  $B(J/\psi(1S) \rightarrow p\bar{p}) = (2.120 \pm 0.029) \times 10^{-3}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>2</sup> Measurement includes contribution where  $p\bar{p}$  is produced in charmonia decays.

### $\Gamma(\Theta(1710)^{++}\bar{p}, \Theta^{++} \rightarrow pK^+)/\Gamma_{\text{total}}$

$\Gamma_{464}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b><math>&lt;0.091</math></b>	90	1 WANG	05A BELL	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$<0.1$	90	1,2 AUBERT,B	05L BABR	$e^+e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> Provides upper limits depending on the pentaquark masses between 1.43 to 2.0  $\text{GeV}/c^2$ .

### $\Gamma(f_J(2220)K^+, f_J \rightarrow p\bar{p})/\Gamma_{\text{total}}$

$\Gamma_{465}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b><math>&lt;0.41</math></b>	90	1 WANG	05A BELL	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

### $\Gamma(p\bar{\Lambda}(1520))/\Gamma_{\text{total}}$

$\Gamma_{466}/\Gamma$

VALUE (units $10^{-7}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b><math>3.15 \pm 0.48 \pm 0.27</math></b>		1 AAIJ	14AF LHCb	$pp$ at 7, 8 TeV

• • • We do not use the following data for averages, fits, limits, etc. • • •

$3.9^{+1.0}_{-0.9} \pm 0.3$		1 AAIJ	13AU LHCb	Repl. by AAIJ 14AF
$<15$	90	2 AUBERT,B	05L BABR	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Uses  $B(B^+ \rightarrow J/\psi K^+) = (1.016 \pm 0.033) \times 10^{-3}$ ,  $B(J/\psi \rightarrow p\bar{p}) = (2.17 \pm 0.07) \times 10^{-3}$  and  $B(\Lambda(1520) \rightarrow K^- p) = 0.234 \pm 0.016$ .

<sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

### $\Gamma(p\bar{p}K^+ \text{ nonresonant})/\Gamma_{\text{total}}$

$\Gamma_{467}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b><math>&lt;89</math></b>	90	BERGFELD	96B CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

$\Gamma(\rho\bar{p}K^*(892)^+)/\Gamma_{\text{total}}$   $\Gamma_{468}/\Gamma$ 

<u>VALUE (units <math>10^{-6}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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**3.6  $^{+0.8}_{-0.7}$  OUR AVERAGE**3.38  $^{+0.73}_{-0.60} \pm 0.39$       1,2 CHEN      08C BELL     $e^+e^- \rightarrow \Upsilon(4S)$ 5.3  $\pm 1.5 \pm 1.3$       2 AUBERT      07AV BABR     $e^+e^- \rightarrow \Upsilon(4S)$ 

• • • We do not use the following data for averages, fits, limits, etc. • • •

10.3  $^{+3.6}_{-2.8} \ ^{+1.3}_{-1.7}$       2,3 WANG      04 BELL    Repl. by CHEN 08C<sup>1</sup> Explicitly vetoes resonant production of  $\rho\bar{p}$  from charmonium states.<sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .<sup>3</sup> Explicitly vetoes resonant production of  $\rho\bar{p}$  from charmonium states. The branching fraction for  $M_{\rho\bar{p}} < 2.85 \text{ GeV}/c^2$  is also reported. $\Gamma(f_J(2220)K^{*+}, f_J \rightarrow \rho\bar{p})/\Gamma_{\text{total}}$   $\Gamma_{469}/\Gamma$ 

<u>VALUE (units <math>10^{-6}</math>)</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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**<0.77**      90      1 AUBERT      07AV BABR     $e^+e^- \rightarrow \Upsilon(4S)$ <sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ . $\Gamma(\rho\bar{\Lambda})/\Gamma_{\text{total}}$   $\Gamma_{470}/\Gamma$ 

<u>VALUE (units <math>10^{-6}</math>)</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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**< 0.32**      90      1 TSAI      07 BELL     $e^+e^- \rightarrow \Upsilon(4S)$ 

• • • We do not use the following data for averages, fits, limits, etc. • • •

&lt; 0.49      90      1 CHANG      05 BELL    Repl. by TSAI 07

< 1.5      90      1 BORNHEIM    03 CLE2     $e^+e^- \rightarrow \Upsilon(4S)$ < 2.2      90      1 ABE      02O BELL     $e^+e^- \rightarrow \Upsilon(4S)$ < 2.6      90      1 COAN      99 CLE2     $e^+e^- \rightarrow \Upsilon(4S)$ <60      90      2 AVERY      89B CLEO     $e^+e^- \rightarrow \Upsilon(4S)$ <93      90      3 ALBRECHT    88F ARG     $e^+e^- \rightarrow \Upsilon(4S)$ <sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .<sup>2</sup> AVERY 89B reports  $< 5 \times 10^{-5}$  assuming the  $\Upsilon(4S)$  decays 43% to  $B^0\bar{B}^0$ . We rescale to 50%.<sup>3</sup> ALBRECHT 88F reports  $< 8.5 \times 10^{-5}$  assuming the  $\Upsilon(4S)$  decays 45% to  $B^0\bar{B}^0$ . We rescale to 50%. $\Gamma(\rho\bar{\Lambda}\gamma)/\Gamma_{\text{total}}$   $\Gamma_{471}/\Gamma$ 

<u>VALUE (units <math>10^{-6}</math>)</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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**2.45  $^{+0.44}_{-0.38} \pm 0.22$**       1 WANG      07C BELL     $e^+e^- \rightarrow \Upsilon(4S)$ 

• • • We do not use the following data for averages, fits, limits, etc. • • •

2.16  $^{+0.58}_{-0.53} \pm 0.20$       1 LEE      05 BELL    Repl. by WANG 07C<3.9      90      2 EDWARDS    03 CLE2     $e^+e^- \rightarrow \Upsilon(4S)$ <sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .<sup>2</sup> Corresponds to  $E_\gamma > 1.5 \text{ GeV}$ . The limit changes to  $3.3 \times 10^{-6}$  for  $E_\gamma > 2.0 \text{ GeV}$ .

$\Gamma(\rho\bar{\lambda}\pi^0)/\Gamma_{\text{total}}$   $\Gamma_{472}/\Gamma$ 

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
$3.00^{+0.61}_{-0.53} \pm 0.33$		<sup>1</sup> WANG	07C BELL	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

 $\Gamma(\rho\bar{\Sigma}(1385)^0)/\Gamma_{\text{total}}$   $\Gamma_{473}/\Gamma$ 

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
$<0.47$	90	<sup>1</sup> WANG	07C BELL	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

 $\Gamma(\Delta^+\bar{\lambda})/\Gamma_{\text{total}}$   $\Gamma_{474}/\Gamma$ 

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
$<0.82$	90	<sup>1</sup> WANG	07C BELL	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

 $\Gamma(\rho\bar{\Sigma}\gamma)/\Gamma_{\text{total}}$   $\Gamma_{475}/\Gamma$ 

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
$<4.6$	90	<sup>1</sup> LEE	05 BELL	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$<7.9$	90	<sup>2</sup> EDWARDS	03 CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> Corresponds to  $E_\gamma > 1.5$  GeV. The limit changes to  $6.4 \times 10^{-6}$  for  $E_\gamma > 2.0$  GeV.

 $\Gamma(\rho\bar{\lambda}\pi^+\pi^-)/\Gamma_{\text{total}}$   $\Gamma_{476}/\Gamma$ 

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
$5.92^{+0.88}_{-0.84} \pm 0.69$		<sup>1</sup> CHEN	09C BELL	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$<200$	90	<sup>2</sup> ALBRECHT	88F ARG	$e^+e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> ALBRECHT 88F reports  $< 1.8 \times 10^{-4}$  assuming the  $\Upsilon(4S)$  decays 45% to  $B^0\bar{B}^0$ . We rescale to 50%.

 $\Gamma(\rho\bar{\lambda}\rho^0)/\Gamma_{\text{total}}$   $\Gamma_{477}/\Gamma$ 

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
$4.78^{+0.67}_{-0.64} \pm 0.60$		<sup>1</sup> CHEN	09C BELL	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

 $\Gamma(\rho\bar{\lambda}f_2(1270))/\Gamma_{\text{total}}$   $\Gamma_{478}/\Gamma$ 

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
$2.03^{+0.77}_{-0.72} \pm 0.27$		<sup>1</sup> CHEN	09C BELL	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\Lambda\bar{\Lambda}\pi^+)/\Gamma_{\text{total}}$   $\Gamma_{479}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
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<b>&lt;0.94</b>	90	1,2 CHANG	09	BELL Repl. by CHANG 09
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• • • We do not use the following data for averages, fits, limits, etc. • • •

<2.8	90	<sup>2</sup> LEE	04	BELL $e^+e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> For  $m_{\Lambda\bar{\Lambda}} < 2.85 \text{ GeV}/c^2$ .

<sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\Lambda\bar{\Lambda}K^+)/\Gamma_{\text{total}}$   $\Gamma_{480}/\Gamma$

VALUE (units $10^{-6}$ )	DOCUMENT ID	TECN	COMMENT
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<b><math>3.38^{+0.41}_{-0.36} \pm 0.41</math></b>	1,2 CHANG	09	BELL $e^+e^- \rightarrow \Upsilon(4S)$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

$2.91^{+0.9}_{-0.70} \pm 0.38$	<sup>2</sup> LEE	04	BELL Repl. by CHANG 09
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<sup>1</sup> Excluding charmonium events in  $2.85 < m_{\Lambda\bar{\Lambda}} < 3.128 \text{ GeV}/c^2$  and  $3.315 < m_{\Lambda\bar{\Lambda}} < 3.735 \text{ GeV}/c^2$ . Measurements in various  $m_{\Lambda\bar{\Lambda}}$  bins are also reported.

<sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\Lambda\bar{\Lambda}K^{*+})/\Gamma_{\text{total}}$   $\Gamma_{481}/\Gamma$

VALUE (units $10^{-6}$ )	DOCUMENT ID	TECN	COMMENT
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<b><math>2.19^{+1.13}_{-0.88} \pm 0.33</math></b>	1,2 CHANG	09	BELL $e^+e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> For  $m_{\Lambda\bar{\Lambda}} < 2.85 \text{ GeV}/c^2$ .

<sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\bar{\Delta}^0 p)/\Gamma_{\text{total}}$   $\Gamma_{482}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
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<b>&lt; 1.38</b>	90	<sup>1</sup> WEI	08	BELL $e^+e^- \rightarrow \Upsilon(4S)$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

<380	90	<sup>2</sup> BORTOLETTO89	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> BORTOLETTO 89 reports  $< 3.3 \times 10^{-4}$  assuming the  $\Upsilon(4S)$  decays 43% to  $B^0\bar{B}^0$ . We rescale to 50%.

$\Gamma(\Delta^{++}\bar{p})/\Gamma_{\text{total}}$   $\Gamma_{483}/\Gamma$

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
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<b>&lt; 0.14</b>	90	<sup>1</sup> WEI	08	BELL $e^+e^- \rightarrow \Upsilon(4S)$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

<150	90	<sup>2</sup> BORTOLETTO89	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> BORTOLETTO 89 reports  $< 1.3 \times 10^{-4}$  assuming the  $\Upsilon(4S)$  decays 43% to  $B^0\bar{B}^0$ . We rescale to 50%.

$\Gamma(D^+ \rho \bar{p})/\Gamma_{\text{total}}$   $\Gamma_{484}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<1.5 \times 10^{-5}$	90	<sup>1</sup> ABE	02W BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(D^{*(2010)+} \rho \bar{p})/\Gamma_{\text{total}}$   $\Gamma_{485}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<1.5 \times 10^{-5}$	90	<sup>1</sup> ABE	02W BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\bar{D}^0 \rho \bar{p} \pi^+)/\Gamma_{\text{total}}$   $\Gamma_{486}/\Gamma$

VALUE (units $10^{-4}$ )	DOCUMENT ID	TECN	COMMENT
$3.72 \pm 0.11 \pm 0.25$	<sup>1,2</sup> DEL-AMO-SA..12	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Uses the values of  $D$  and  $D^*$  branching fractions from PDG 08.

<sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\bar{D}^{*0} \rho \bar{p} \pi^+)/\Gamma_{\text{total}}$   $\Gamma_{487}/\Gamma$

VALUE (units $10^{-4}$ )	DOCUMENT ID	TECN	COMMENT
$3.73 \pm 0.17 \pm 0.27$	<sup>1,2</sup> DEL-AMO-SA..12	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Uses the values of  $D$  and  $D^*$  branching fractions from PDG 08.

<sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(D^- \rho \bar{p} \pi^+ \pi^-)/\Gamma_{\text{total}}$   $\Gamma_{488}/\Gamma$

VALUE (units $10^{-4}$ )	DOCUMENT ID	TECN	COMMENT
$1.66 \pm 0.13 \pm 0.27$	<sup>1,2</sup> DEL-AMO-SA..12	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Uses the values of  $D$  and  $D^*$  branching fractions from PDG 08.

<sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(D^{*-} \rho \bar{p} \pi^+ \pi^-)/\Gamma_{\text{total}}$   $\Gamma_{489}/\Gamma$

VALUE (units $10^{-4}$ )	DOCUMENT ID	TECN	COMMENT
$1.86 \pm 0.16 \pm 0.19$	<sup>1,2</sup> DEL-AMO-SA..12	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Uses the values of  $D$  and  $D^*$  branching fractions from PDG 08.

<sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\rho \bar{\Lambda}^0 \bar{D}^0)/\Gamma_{\text{total}}$   $\Gamma_{490}/\Gamma$

VALUE (units $10^{-5}$ )	DOCUMENT ID	TECN	COMMENT
$1.43^{+0.28}_{-0.25} \pm 0.18$	<sup>1,2</sup> CHEN	11F BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Uses  $B(\Lambda \rightarrow p \pi^-) = 63.9 \pm 0.5\%$ ,  $B(D^0 \rightarrow K^- \pi^+) = 3.89 \pm 0.05\%$ , and  $B(D^0 \rightarrow K^- \pi^+ \pi^0) = 13.9 \pm 0.5\%$ .

<sup>2</sup> Assumes equal production of  $B^0$  and  $B^+$  from Upsilon(4S) decays.

$$\Gamma(p\bar{\Lambda}^0\bar{D}^*(2007)^0)/\Gamma_{\text{total}} \qquad \Gamma_{491}/\Gamma$$

VALUE (units $10^{-5}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<5	90	1,2,3 CHEN	11F BELL	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> CHEN 11F reports  $< 4.8 \times 10^{-5}$  from a measurement of  $[\Gamma(B^+ \rightarrow p\bar{\Lambda}^0\bar{D}^*(2007)^0)/\Gamma_{\text{total}}] / [B(D^*(2007)^0 \rightarrow D^0\pi^0)]$  assuming  $B(D^*(2007)^0 \rightarrow D^0\pi^0) = (61.9 \pm 2.9) \times 10^{-2}$ , which we rescale to our best value  $B(D^*(2007)^0 \rightarrow D^0\pi^0) = 64.7 \times 10^{-2}$ .

<sup>2</sup> Uses  $B(\Lambda \rightarrow p\pi^-) = 63.9 \pm 0.5\%$  and  $B(D^0 \rightarrow K^-\pi^+) = 3.89 \pm 0.05\%$ .

<sup>3</sup> Assumes equal production of  $B^0$  and  $B^+$  from Upsilon(4S) decays.

$$\Gamma(\bar{\Lambda}_c^- p\pi^+)/\Gamma_{\text{total}} \qquad \Gamma_{492}/\Gamma$$

VALUE (units $10^{-4}$ )	DOCUMENT ID	TECN	COMMENT
<b>2.2 ± 0.4 OUR AVERAGE</b>	Error includes scale factor of 2.2. See the ideogram below.		
2.68 ± 0.15 ± 0.14	1,2 AUBERT	08BN BABR	$e^+e^- \rightarrow \Upsilon(4S)$
1.58 ± 0.20 ± 0.08	1,3 GABYSHEV	06A BELL	$e^+e^- \rightarrow \Upsilon(4S)$
1.9 ± 0.5 ± 0.1	1,4 DYTMAN	02 CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
1.5 ± 0.4 ± 0.1	1,5 GABYSHEV	02 BELL	Repl. by GABYSHEV 06A
6.2 $^{+2.3}_{-2.0}$ ± 1.6	1,6 FU	97 CLE2	Repl. by DYTMAN 02

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> AUBERT 08BN reports  $(3.4 \pm 0.1 \pm 0.9) \times 10^{-4}$  from a measurement of  $[\Gamma(B^+ \rightarrow \bar{\Lambda}_c^- p\pi^+)/\Gamma_{\text{total}}] \times [B(\Lambda_c^+ \rightarrow pK^-\pi^+)]$  assuming  $B(\Lambda_c^+ \rightarrow pK^-\pi^+) = (5.0 \pm 1.3) \times 10^{-2}$ , which we rescale to our best value  $B(\Lambda_c^+ \rightarrow pK^-\pi^+) = (6.35 \pm 0.33) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>3</sup> GABYSHEV 06A reports  $(2.01 \pm 0.15 \pm 0.20) \times 10^{-4}$  from a measurement of  $[\Gamma(B^+ \rightarrow \bar{\Lambda}_c^- p\pi^+)/\Gamma_{\text{total}}] \times [B(\Lambda_c^+ \rightarrow pK^-\pi^+)]$  assuming  $B(\Lambda_c^+ \rightarrow pK^-\pi^+) = 0.05$ , which we rescale to our best value  $B(\Lambda_c^+ \rightarrow pK^-\pi^+) = (6.35 \pm 0.33) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

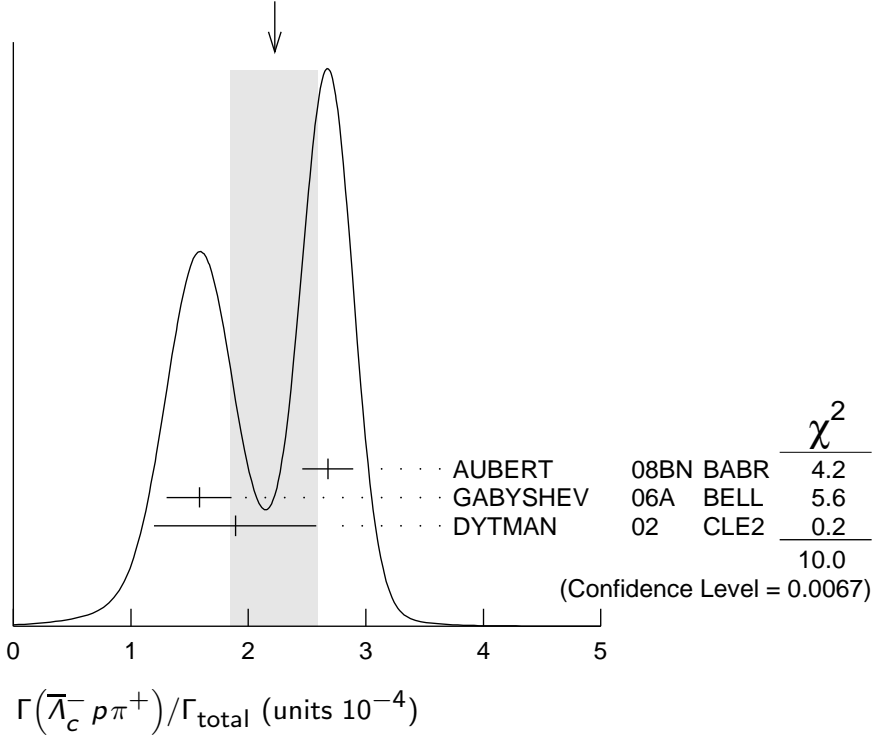
<sup>4</sup> DYTMAN 02 reports  $(2.4^{+0.63}_{-0.62}) \times 10^{-4}$  from a measurement of  $[\Gamma(B^+ \rightarrow \bar{\Lambda}_c^- p\pi^+)/\Gamma_{\text{total}}] \times [B(\Lambda_c^+ \rightarrow pK^-\pi^+)]$  assuming  $B(\Lambda_c^+ \rightarrow pK^-\pi^+) = 0.05$ , which we rescale to our best value  $B(\Lambda_c^+ \rightarrow pK^-\pi^+) = (6.35 \pm 0.33) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>5</sup> GABYSHEV 02 reports  $(1.87^{+0.51}_{-0.49}) \times 10^{-4}$  from a measurement of  $[\Gamma(B^+ \rightarrow \bar{\Lambda}_c^- p\pi^+)/\Gamma_{\text{total}}] \times [B(\Lambda_c^+ \rightarrow pK^-\pi^+)]$  assuming  $B(\Lambda_c^+ \rightarrow pK^-\pi^+) = 0.05$ , which we rescale to our best value  $B(\Lambda_c^+ \rightarrow pK^-\pi^+) = (6.35 \pm 0.33) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>6</sup> FU 97 uses PDG 96 values of  $\Lambda_c$  branching fraction.



WEIGHTED AVERAGE  
 $2.2 \pm 0.4$  (Error scaled by 2.2)



$\Gamma(\bar{\Lambda}_c^- \Delta(1232)^{++}) / \Gamma_{\text{total}}$

$\Gamma_{493} / \Gamma$

VALUE (units $10^{-5}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;1.9</b>	90	GABYSHEV 06A	BELL	$e^+ e^- \rightarrow \gamma(4S)$

$\Gamma(\bar{\Lambda}_c^- \Delta_X(1600)^{++}) / \Gamma_{\text{total}}$

$\Gamma_{494} / \Gamma$

VALUE (units $10^{-5}$ )	DOCUMENT ID	TECN	COMMENT
<b><math>4.6 \pm 0.9 \pm 0.2</math></b>	<sup>1</sup> GABYSHEV 06A	BELL	$e^+ e^- \rightarrow \gamma(4S)$

<sup>1</sup> GABYSHEV 06A reports  $(5.9 \pm 1.0 \pm 0.6) \times 10^{-5}$  from a measurement of  $[\Gamma(B^+ \rightarrow \bar{\Lambda}_c^- \Delta_X(1600)^{++}) / \Gamma_{\text{total}}] \times [B(\Lambda_c^+ \rightarrow p K^- \pi^+)]$  assuming  $B(\Lambda_c^+ \rightarrow p K^- \pi^+) = 0.05$ , which we rescale to our best value  $B(\Lambda_c^+ \rightarrow p K^- \pi^+) = (6.35 \pm 0.33) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\bar{\Lambda}_c^- \Delta_X(2420)^{++}) / \Gamma_{\text{total}}$

$\Gamma_{495} / \Gamma$

VALUE (units $10^{-5}$ )	DOCUMENT ID	TECN	COMMENT
<b><math>3.7 \pm 0.8 \pm 0.2</math></b>	<sup>1</sup> GABYSHEV 06A	BELL	$e^+ e^- \rightarrow \gamma(4S)$

<sup>1</sup> GABYSHEV 06A reports  $(4.7_{-0.9}^{+1.0} \pm 0.4) \times 10^{-5}$  from a measurement of  $[\Gamma(B^+ \rightarrow \bar{\Lambda}_c^- \Delta_X(2420)^{++}) / \Gamma_{\text{total}}] \times [B(\Lambda_c^+ \rightarrow p K^- \pi^+)]$  assuming  $B(\Lambda_c^+ \rightarrow p K^- \pi^+) = 0.05$ , which we rescale to our best value  $B(\Lambda_c^+ \rightarrow p K^- \pi^+) = (6.35 \pm 0.33) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\bar{\Lambda}_c^- p)_s \pi^+ / \Gamma_{\text{total}}$   $\Gamma_{496} / \Gamma$

$(\bar{\Lambda}_c^- p)_s$  denotes a low-mass enhancement near 3.35 GeV/c<sup>2</sup>.

VALUE (units 10 <sup>-5</sup> )	CL%	DOCUMENT ID	TECN	COMMENT
<b>3.1<sup>+0.7</sup><sub>-0.6</sub> ± 0.2</b>		<sup>1</sup> GABYSHEV	06A BELL	e <sup>+</sup> e <sup>-</sup> → $\Upsilon(4S)$

<sup>1</sup> GABYSHEV 06A reports  $(3.9^{+0.8}_{-0.7} \pm 0.4) \times 10^{-5}$  from a measurement of  $[\Gamma(B^+ \rightarrow (\bar{\Lambda}_c^- p)_s \pi^+) / \Gamma_{\text{total}}] \times [B(\Lambda_c^+ \rightarrow p K^- \pi^+)]$  assuming  $B(\Lambda_c^+ \rightarrow p K^- \pi^+) = 0.05$ , which we rescale to our best value  $B(\Lambda_c^+ \rightarrow p K^- \pi^+) = (6.35 \pm 0.33) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\bar{\Sigma}_c(2520)^0 p) / \Gamma_{\text{total}}$   $\Gamma_{497} / \Gamma$

VALUE (units 10 <sup>-5</sup> )	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;0.3</b>	90	<sup>1,2</sup> AUBERT	08BN BABR	e <sup>+</sup> e <sup>-</sup> → $\Upsilon(4S)$
•••		We do not use the following data for averages, fits, limits, etc. •••		
<2.7	90	<sup>1,2</sup> GABYSHEV	06A BELL	e <sup>+</sup> e <sup>-</sup> → $\Upsilon(4S)$
<4.6	90	<sup>1,2</sup> GABYSHEV	02 BELL	Repl. by GABYSHEV 06A

<sup>1</sup> Assumes equal production of B<sup>+</sup> and B<sup>0</sup> at the  $\Upsilon(4S)$ .

<sup>2</sup> Uses the value for  $\Lambda_c \rightarrow p K^- \pi^+$  branching ratio  $(5.0 \pm 1.3)\%$ .

$\Gamma(\bar{\Sigma}_c(2520)^0 p) / \Gamma(\bar{\Lambda}_c^- p \pi^+)$   $\Gamma_{497} / \Gamma_{492}$

VALUE (units 10 <sup>-3</sup> )	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;9</b>	90	AUBERT	08BN BABR	e <sup>+</sup> e <sup>-</sup> → $\Upsilon(4S)$

$\Gamma(\bar{\Sigma}_c(2800)^0 p) / \Gamma_{\text{total}}$   $\Gamma_{498} / \Gamma$

VALUE (units 10 <sup>-5</sup> )	CL%	DOCUMENT ID	TECN	COMMENT
<b>2.6 ± 0.7 ± 0.4</b>		<sup>1</sup> AUBERT	08BN BABR	e <sup>+</sup> e <sup>-</sup> → $\Upsilon(4S)$

<sup>1</sup> AUBERT 08BN reports  $[\Gamma(B^+ \rightarrow \bar{\Sigma}_c(2800)^0 p) / \Gamma_{\text{total}}] / [B(B^+ \rightarrow \bar{\Lambda}_c^- p \pi^+)] = 0.117 \pm 0.023 \pm 0.024$  which we multiply by our best value  $B(B^+ \rightarrow \bar{\Lambda}_c^- p \pi^+) = (2.2 \pm 0.4) \times 10^{-4}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\bar{\Lambda}_c^- p \pi^+ \pi^0) / \Gamma_{\text{total}}$   $\Gamma_{499} / \Gamma$

VALUE (units 10 <sup>-3</sup> )	CL%	DOCUMENT ID	TECN	COMMENT
<b>1.81 ± 0.29<sup>+0.52</sup><sub>-0.50</sub></b>		<sup>1,2</sup> DYTMAN	02 CLE2	e <sup>+</sup> e <sup>-</sup> → $\Upsilon(4S)$

••• We do not use the following data for averages, fits, limits, etc. •••

<3.12	90	<sup>3</sup> FU	97 CLE2	e <sup>+</sup> e <sup>-</sup> → $\Upsilon(4S)$
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<sup>1</sup> Assumes equal production of B<sup>+</sup> and B<sup>0</sup> at the  $\Upsilon(4S)$ .

<sup>2</sup> DYTMAN 02 measurement uses  $B(\Lambda_c^- \rightarrow \bar{p} K^+ \pi^-) = 5.0 \pm 1.3\%$ . The second error includes the systematic and the uncertainty of the branching ratio.

<sup>3</sup> FU 97 uses PDG 96 values of  $\Lambda_c$  branching ratio.

$\Gamma(\bar{\Lambda}_c^- p \pi^+ \pi^+ \pi^-)/\Gamma_{\text{total}}$   $\Gamma_{500}/\Gamma$

VALUE (units $10^{-3}$ )	CL%	DOCUMENT ID	TECN	COMMENT
$2.25 \pm 0.25^{+0.63}_{-0.61}$		1,2 DYTMAN 02	CLE2	$e^+ e^- \rightarrow \gamma(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

<1.46	90	<sup>3</sup> FU	97	CLE2 $e^+ e^- \rightarrow \gamma(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\gamma(4S)$ .

<sup>2</sup> DYTMAN 02 measurement uses  $B(\Lambda_c^- \rightarrow \bar{p} K^+ \pi^-) = 5.0 \pm 1.3\%$ . The second error includes the systematic and the uncertainty of the branching ratio.

<sup>3</sup> FU 97 uses PDG 96 values of  $\Lambda_c$  branching ratio.

$\Gamma(\bar{\Lambda}_c^- p \pi^+ \pi^+ \pi^- \pi^0)/\Gamma_{\text{total}}$   $\Gamma_{501}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
< $1.34 \times 10^{-2}$	90	<sup>1</sup> FU	97	CLE2 $e^+ e^- \rightarrow \gamma(4S)$

<sup>1</sup> FU 97 uses PDG 96 values of  $\Lambda_c$  branching ratio.

$\Gamma(\Lambda_c^+ \Lambda_c^- K^+)/\Gamma_{\text{total}}$   $\Gamma_{502}/\Gamma$

VALUE (units $10^{-4}$ )	DOCUMENT ID	TECN	COMMENT
<b>6.9 ± 2.2 OUR AVERAGE</b>			
9.0 ± 4.4 ± 0.5	1,2 AUBERT 08H	BABR	$e^+ e^- \rightarrow \gamma(4S)$
6.2 <sup>+2.5</sup> <sub>-2.4</sub> ± 0.3	2,3 GABYSHEV 06	BELL	$e^+ e^- \rightarrow \gamma(4S)$

<sup>1</sup> AUBERT 08H reports  $(1.14 \pm 0.15 \pm 0.62) \times 10^{-3}$  from a measurement of  $[\Gamma(B^+ \rightarrow \Lambda_c^+ \Lambda_c^- K^+)/\Gamma_{\text{total}}] \times [B(\Lambda_c^+ \rightarrow p K^- \pi^+)]$  assuming  $B(\Lambda_c^+ \rightarrow p K^- \pi^+) = (5.0 \pm 1.3) \times 10^{-2}$ , which we rescale to our best value  $B(\Lambda_c^+ \rightarrow p K^- \pi^+) = (6.35 \pm 0.33) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\gamma(4S)$ .

<sup>3</sup> GABYSHEV 06 reports  $(7.9^{+1.0}_{-0.9} \pm 3.6) \times 10^{-4}$  from a measurement of  $[\Gamma(B^+ \rightarrow \Lambda_c^+ \Lambda_c^- K^+)/\Gamma_{\text{total}}] \times [B(\Lambda_c^+ \rightarrow p K^- \pi^+)]$  assuming  $B(\Lambda_c^+ \rightarrow p K^- \pi^+) = (5.0 \pm 1.3) \times 10^{-2}$ , which we rescale to our best value  $B(\Lambda_c^+ \rightarrow p K^- \pi^+) = (6.35 \pm 0.33) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\bar{\Sigma}_c(2455)^0 p)/\Gamma_{\text{total}}$   $\Gamma_{503}/\Gamma$

VALUE (units $10^{-5}$ )	CL%	DOCUMENT ID	TECN	COMMENT
$2.9 \pm 0.6^{+0.2}_{-0.1}$		1,2 GABYSHEV 06A	BELL	$e^+ e^- \rightarrow \gamma(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

<8	90	1,3 DYTMAN 02	CLE2	$e^+ e^- \rightarrow \gamma(4S)$
<9.3	90	1,4 GABYSHEV 02	BELL	Repl. by GABYSHEV 06A

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> GABYSHEV 06A reports  $(3.7 \pm 0.7 \pm 0.4) \times 10^{-5}$  from a measurement of  $[\Gamma(B^+ \rightarrow \bar{\Sigma}_c(2455)^0 p)/\Gamma_{\text{total}}] \times [B(\Lambda_c^+ \rightarrow p K^- \pi^+)]$  assuming  $B(\Lambda_c^+ \rightarrow p K^- \pi^+) = 0.05$ , which we rescale to our best value  $B(\Lambda_c^+ \rightarrow p K^- \pi^+) = (6.35 \pm 0.33) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>3</sup> DYTMAN 02 measurement uses  $B(\Lambda_c^- \rightarrow \bar{p} K^+ \pi^-) = 5.0 \pm 1.3\%$ . The second error includes the systematic and the uncertainty of the branching ratio.

<sup>4</sup> Uses the value for  $\Lambda_c \rightarrow p K^- \pi^+$  branching ratio  $(5.0 \pm 1.3)\%$ .

### $\Gamma(\bar{\Sigma}_c(2455)^0 p)/\Gamma(\bar{\Lambda}_c^- p \pi^+)$ $\Gamma_{503}/\Gamma_{492}$

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.123±0.012±0.008</b>	<sup>1</sup> AUBERT	08BN BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

### $\Gamma(\bar{\Sigma}_c(2455)^0 p \pi^0)/\Gamma_{\text{total}}$ $\Gamma_{504}/\Gamma$

<u>VALUE (units <math>10^{-4}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>3.5±1.1±0.2</b>	<sup>1,2</sup> DYTMAN	02 CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> DYTMAN 02 reports  $(4.4 \pm 1.4) \times 10^{-4}$  from a measurement of  $[\Gamma(B^+ \rightarrow \bar{\Sigma}_c(2455)^0 p \pi^0)/\Gamma_{\text{total}}] \times [B(\Lambda_c^+ \rightarrow p K^- \pi^+)]$  assuming  $B(\Lambda_c^+ \rightarrow p K^- \pi^+) = 0.05$ , which we rescale to our best value  $B(\Lambda_c^+ \rightarrow p K^- \pi^+) = (6.35 \pm 0.33) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

### $\Gamma(\bar{\Sigma}_c(2455)^0 p \pi^- \pi^+)/\Gamma_{\text{total}}$ $\Gamma_{505}/\Gamma$

<u>VALUE (units <math>10^{-4}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>3.5±1.0±0.2</b>	<sup>1,2</sup> DYTMAN	02 CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> DYTMAN 02 reports  $(4.4 \pm 1.3) \times 10^{-4}$  from a measurement of  $[\Gamma(B^+ \rightarrow \bar{\Sigma}_c(2455)^0 p \pi^- \pi^+)/\Gamma_{\text{total}}] \times [B(\Lambda_c^+ \rightarrow p K^- \pi^+)]$  assuming  $B(\Lambda_c^+ \rightarrow p K^- \pi^+) = 0.05$ , which we rescale to our best value  $B(\Lambda_c^+ \rightarrow p K^- \pi^+) = (6.35 \pm 0.33) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

### $\Gamma(\bar{\Sigma}_c(2455)^{--} p \pi^+ \pi^+)/\Gamma_{\text{total}}$ $\Gamma_{506}/\Gamma$

<u>VALUE (units <math>10^{-4}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>2.34±0.20 OUR AVERAGE</b>			

2.35±0.16 <sup>+0.13</sup> <sub>-0.12</sub>	<sup>1,2</sup> LEES	12Z BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
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2.2 ± 0.8 ± 0.1	<sup>1,3</sup> DYTMAN	02 CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> LEES 12Z reports  $(2.98 \pm 0.16 \pm 0.15 \pm 0.77) \times 10^{-4}$  from a measurement of  $[\Gamma(B^+ \rightarrow \bar{\Sigma}_c(2455)^{--} p \pi^+ \pi^+)/\Gamma_{\text{total}}] \times [B(\Lambda_c^+ \rightarrow p K^- \pi^+)]$  assuming  $B(\Lambda_c^+ \rightarrow p K^- \pi^+) = (5.0 \pm 1.3) \times 10^{-2}$ , which we rescale to our best value  $B(\Lambda_c^+ \rightarrow p K^- \pi^+) = (6.35 \pm 0.33) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>3</sup> DYTMAN 02 reports  $(2.8 \pm 0.9 \pm 0.5 \pm 0.7) \times 10^{-4}$  from a measurement of  $[\Gamma(B^+ \rightarrow \bar{\Sigma}_c(2455)^- \rho \pi^+ \pi^+) / \Gamma_{\text{total}}] \times [B(\Lambda_c^+ \rightarrow \rho K^- \pi^+)]$  assuming  $B(\Lambda_c^+ \rightarrow \rho K^- \pi^+) = (5.0 \pm 1.3) \times 10^{-2}$ , which we rescale to our best value  $B(\Lambda_c^+ \rightarrow \rho K^- \pi^+) = (6.35 \pm 0.33) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

**$\Gamma(\bar{\Lambda}_c(2593)^- / \bar{\Lambda}_c(2625)^- \rho \pi^+) / \Gamma_{\text{total}}$   $\Gamma_{507} / \Gamma$**

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$< 1.9 \times 10^{-4}$	90	1,2 DYTMAN 02	CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> DYTMAN 02 measurement uses  $B(\Lambda_c^- \rightarrow \bar{p} K^+ \pi^-) = 5.0 \pm 1.3\%$ . The second error includes the systematic and the uncertainty of the branching ratio.

**$\Gamma(\Xi_c^0 \Lambda_c^+, \Xi_c^0 \rightarrow \Xi^+ \pi^-) / \Gamma_{\text{total}}$   $\Gamma_{508} / \Gamma$**

VALUE (units $10^{-5}$ )	DOCUMENT ID	TECN	COMMENT
<b><math>2.4 \pm 0.9</math> OUR AVERAGE</b>	Error includes scale factor of 1.4.		
$2.0 \pm 0.7 \pm 0.1$	1,2 AUBERT 08H	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
$4.4^{+1.8}_{-1.5} \pm 0.2$	2,3 CHISTOV 06A	BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> AUBERT 08H reports  $(2.51 \pm 0.89 \pm 0.61) \times 10^{-5}$  from a measurement of  $[\Gamma(B^+ \rightarrow \Xi_c^0 \Lambda_c^+, \Xi_c^0 \rightarrow \Xi^+ \pi^-) / \Gamma_{\text{total}}] \times [B(\Lambda_c^+ \rightarrow \rho K^- \pi^+)]$  assuming  $B(\Lambda_c^+ \rightarrow \rho K^- \pi^+) = (5.0 \pm 1.3) \times 10^{-2}$ , which we rescale to our best value  $B(\Lambda_c^+ \rightarrow \rho K^- \pi^+) = (6.35 \pm 0.33) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>3</sup> CHISTOV 06A reports  $(5.6^{+1.9}_{-1.5} \pm 1.9) \times 10^{-5}$  from a measurement of  $[\Gamma(B^+ \rightarrow \Xi_c^0 \Lambda_c^+, \Xi_c^0 \rightarrow \Xi^+ \pi^-) / \Gamma_{\text{total}}] \times [B(\Lambda_c^+ \rightarrow \rho K^- \pi^+)]$  assuming  $B(\Lambda_c^+ \rightarrow \rho K^- \pi^+) = (5.0 \pm 1.3) \times 10^{-2}$ , which we rescale to our best value  $B(\Lambda_c^+ \rightarrow \rho K^- \pi^+) = (6.35 \pm 0.33) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

**$\Gamma(\Xi_c^0 \Lambda_c^+, \Xi_c^0 \rightarrow \Lambda K^+ \pi^-) / \Gamma_{\text{total}}$   $\Gamma_{509} / \Gamma$**

VALUE (units $10^{-5}$ )	DOCUMENT ID	TECN	COMMENT
<b><math>2.1 \pm 0.9</math> OUR AVERAGE</b>	Error includes scale factor of 1.5.		
$1.3 \pm 0.8 \pm 0.1$	1,2 AUBERT 08H	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
$3.1^{+1.1}_{-0.9} \pm 0.2$	2,3 CHISTOV 06A	BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> AUBERT 08H reports  $(1.70 \pm 0.93 \pm 0.53) \times 10^{-5}$  from a measurement of  $[\Gamma(B^+ \rightarrow \Xi_c^0 \Lambda_c^+, \Xi_c^0 \rightarrow \Lambda K^+ \pi^-) / \Gamma_{\text{total}}] \times [B(\Lambda_c^+ \rightarrow \rho K^- \pi^+)]$  assuming  $B(\Lambda_c^+ \rightarrow \rho K^- \pi^+) = (5.0 \pm 1.3) \times 10^{-2}$ , which we rescale to our best value  $B(\Lambda_c^+ \rightarrow \rho K^- \pi^+) = (6.35 \pm 0.33) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>3</sup> CHISTOV 06A reports  $(4.0^{+1.1}_{-0.9} \pm 1.3) \times 10^{-5}$  from a measurement of  $[\Gamma(B^+ \rightarrow \Xi_c^0 \Lambda_c^+, \Xi_c^0 \rightarrow \Lambda K^+ \pi^-) / \Gamma_{\text{total}}] \times [B(\Lambda_c^+ \rightarrow \rho K^- \pi^+)]$  assuming  $B(\Lambda_c^+ \rightarrow \rho K^- \pi^+) = (5.0 \pm 1.3) \times 10^{-2}$ , which we rescale to our best value  $B(\Lambda_c^+ \rightarrow \rho K^- \pi^+) = (6.35 \pm 0.33) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\pi^+ \ell^+ \ell^-)/\Gamma_{\text{total}}$   $\Gamma_{510}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$< 4.9 \times 10^{-8}$	90	<sup>1</sup> WEI	08A BELL	$e^+ e^- \rightarrow \gamma(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
$< 6.6 \times 10^{-8}$	90	<sup>1</sup> LEES	13M BABR	$e^+ e^- \rightarrow \gamma(4S)$
$< 1.2 \times 10^{-7}$	90	<sup>1</sup> AUBERT	07AG BABR	$e^+ e^- \rightarrow \gamma(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\gamma(4S)$ .

$\Gamma(\pi^+ e^+ e^-)/\Gamma_{\text{total}}$   $\Gamma_{511}/\Gamma$

Test for  $\Delta B=1$  weak neutral current. Allowed by higher-order electroweak interactions.

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$< 8.0 \times 10^{-8}$	90	<sup>1</sup> WEI	08A BELL	$e^+ e^- \rightarrow \gamma(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
$< 12.5 \times 10^{-8}$	90	<sup>1</sup> LEES	13M BABR	$e^+ e^- \rightarrow \gamma(4S)$
$< 18 \times 10^{-8}$	90	<sup>1</sup> AUBERT	07AG BABR	$e^+ e^- \rightarrow \gamma(4S)$
$< 3.9 \times 10^{-3}$	90	<sup>2</sup> WEIR	90B MRK2	$e^+ e^-$ 29 GeV

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\gamma(4S)$ .

<sup>2</sup> WEIR 90B assumes  $B^+$  production cross section from LUND.

$\Gamma(\pi^+ \mu^+ \mu^-)/\Gamma_{\text{total}}$   $\Gamma_{512}/\Gamma$

Test for  $\Delta B=1$  weak neutral current. Allowed by higher-order electroweak interactions.

VALUE (units $10^{-8}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b><math>1.79 \pm 0.22 \pm 0.05</math></b>		<sup>1</sup> AAIJ	15AR LHCB	$pp$ at 7, 8 TeV
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
$< 5.5$	90	<sup>2</sup> LEES	13M BABR	$e^+ e^- \rightarrow \gamma(4S)$
$2.3 \pm 0.6 \pm 0.1$		AAIJ	12AY LHCB	Repl. by AAIJ 15AR
$< 6.9$	90	<sup>2</sup> WEI	08A BELL	$e^+ e^- \rightarrow \gamma(4S)$
$< 28$	90	<sup>2</sup> AUBERT	07AG BABR	$e^+ e^- \rightarrow \gamma(4S)$

<sup>1</sup> AAIJ 15AR reports  $(1.83 \pm 0.24 \pm 0.05) \times 10^{-8}$  from a measurement of  $[\Gamma(B^+ \rightarrow \pi^+ \mu^+ \mu^-)/\Gamma_{\text{total}}] / [B(B^+ \rightarrow J/\psi(1S) K^+)] / [B(J/\psi(1S) \rightarrow \mu^+ \mu^-)]$  assuming  $B(B^+ \rightarrow J/\psi(1S) K^+) = (1.05 \pm 0.05) \times 10^{-3}$ ,  $B(J/\psi(1S) \rightarrow \mu^+ \mu^-) = (5.961 \pm 0.033) \times 10^{-2}$ , which we rescale to our best values  $B(B^+ \rightarrow J/\psi(1S) K^+) = (1.026 \pm 0.031) \times 10^{-3}$ ,  $B(J/\psi(1S) \rightarrow \mu^+ \mu^-) = (5.961 \pm 0.033) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best values.

<sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\gamma(4S)$ .

$\Gamma(\pi^+ \mu^+ \mu^-)/\Gamma(K^+ \mu^+ \mu^-)$   $\Gamma_{512}/\Gamma_{516}$

VALUE	DOCUMENT ID	TECN	COMMENT
$0.053 \pm 0.014 \pm 0.001$	AAIJ	12AY LHCB	Repl. by AAIJ 15AR

$\Gamma(\pi^+ \nu \bar{\nu})/\Gamma_{\text{total}}$   $\Gamma_{513}/\Gamma$

Test for  $\Delta B=1$  weak neutral current. Allowed by higher-order electroweak interactions.

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$< 9.8 \times 10^{-5}$	90	<sup>1</sup> LUTZ	13 BELL	$e^+ e^- \rightarrow \gamma(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
$< 1.7 \times 10^{-4}$	90	<sup>1</sup> CHEN	07D BELL	$e^+ e^- \rightarrow \gamma(4S)$
$< 1.0 \times 10^{-4}$	90	<sup>1</sup> AUBERT	05H BABR	$e^+ e^- \rightarrow \gamma(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\gamma(4S)$ .

$\Gamma(K^+ \ell^+ \ell^-) / \Gamma_{\text{total}}$   $\Gamma_{514} / \Gamma$

Test for  $\Delta B=1$  weak neutral current. Allowed by higher-order electroweak interactions.

VALUE (units $10^{-7}$ )	DOCUMENT ID	TECN	COMMENT
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**4.51 ± 0.23 OUR AVERAGE** Error includes scale factor of 1.1.

4.36 ± 0.15 ± 0.18	<sup>1</sup> AAIJ	13H	LHCB $pp$ at 7 TeV
4.8 ± 0.9 ± 0.2	<sup>2</sup> AUBERT	09T	BABR $e^+ e^- \rightarrow \Upsilon(4S)$
5.3 $^{+0.6}_{-0.5}$ ± 0.3	<sup>2</sup> WEI	09A	BELL $e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

3.8 $^{+0.9}_{-0.8}$ ± 0.2	<sup>2</sup> AUBERT,B	06J	BABR Repl. by AUBERT 09T
5.3 $^{+1.1}_{-1.0}$ ± 0.3	<sup>2</sup> ISHIKAWA	03	BELL Repl. by WEI 09A

<sup>1</sup> Uses  $B(B^+ \rightarrow J/\psi K^+ \rightarrow \mu^+ \mu^- K^+) = (6.01 \pm 0.21) \times 10^{-5}$ .

<sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(K^+ e^+ e^-) / \Gamma_{\text{total}}$   $\Gamma_{515} / \Gamma$

Test for  $\Delta B=1$  weak neutral current. Allowed by higher-order electroweak interactions.

VALUE (units $10^{-7}$ )	CL%	DOCUMENT ID	TECN	COMMENT
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**5.5 ± 0.7 OUR AVERAGE**

5.1 $^{+1.2}_{-1.1}$ ± 0.2		<sup>1</sup> AUBERT	09T	BABR $e^+ e^- \rightarrow \Upsilon(4S)$
5.7 $^{+0.9}_{-0.8}$ ± 0.3		<sup>1</sup> WEI	09A	BELL $e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

4.2 $^{+1.2}_{-1.1}$ ± 0.2		<sup>1</sup> AUBERT,B	06J	BABR Repl. by AUBERT 09T
10.5 $^{+2.5}_{-2.2}$ ± 0.7		<sup>1</sup> AUBERT	03U	BABR Repl. by AUBERT,B 06J
6.3 $^{+1.9}_{-1.7}$ ± 0.3		<sup>2</sup> ISHIKAWA	03	BELL Repl. by WEI 09A
< 14	90	<sup>1</sup> ABE	02	BELL $e^+ e^- \rightarrow \Upsilon(4S)$
< 9	90	<sup>1</sup> AUBERT	02L	BABR $e^+ e^- \rightarrow \Upsilon(4S)$
< 24	90	<sup>3</sup> ANDERSON	01B	CLE2 $e^+ e^- \rightarrow \Upsilon(4S)$
< 990	90	<sup>4</sup> ALBRECHT	91E	ARG $e^+ e^- \rightarrow \Upsilon(4S)$
< 68000	90	<sup>5</sup> WEIR	90B	MRK2 $e^+ e^-$ 29 GeV
< 600	90	<sup>6</sup> AVERY	89B	CLEO $e^+ e^- \rightarrow \Upsilon(4S)$
< 2500	90	<sup>7</sup> AVERY	87	CLEO $e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> Assumes equal production of  $B^0$  and  $B^+$  at  $\Upsilon(4S)$ . The second error is a total of systematic uncertainties including model dependence.

<sup>3</sup> The result is for di-lepton masses above 0.5 GeV.

<sup>4</sup> ALBRECHT 91E reports  $< 9.0 \times 10^{-5}$  assuming the  $\Upsilon(4S)$  decays 45% to  $B^0 \bar{B}^0$ . We rescale to 50%.

<sup>5</sup> WEIR 90B assumes  $B^+$  production cross section from LUND.

<sup>6</sup> AVERY 89B reports  $< 5 \times 10^{-5}$  assuming the  $\Upsilon(4S)$  decays 43% to  $B^0 \bar{B}^0$ . We rescale to 50%.

<sup>7</sup> AVERY 87 reports  $< 2.1 \times 10^{-4}$  assuming the  $\Upsilon(4S)$  decays 40% to  $B^0 \bar{B}^0$ . We rescale to 50%.

$\Gamma(K^+ \mu^+ \mu^-) / \Gamma_{\text{total}}$   $\Gamma_{516} / \Gamma$

Test for  $\Delta B=1$  weak neutral current. Allowed by higher-order electroweak interactions.

<u>VALUE (units <math>10^{-7}</math>)</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>4.43 ± 0.24 OUR FIT</b> Error includes scale factor of 1.2.				
<b>4.36 ± 0.27 OUR AVERAGE</b> Error includes scale factor of 1.3.				
4.29 ± 0.07 ± 0.21		<sup>1</sup> AAIJ	14M LHCb	$p\bar{p}$ at 7, 8 TeV
4.1 <sup>+1.6</sup> <sub>-1.5</sub> ± 0.2		<sup>2</sup> AUBERT	09T BABR	$e^+e^- \rightarrow \Upsilon(4S)$
5.3 <sup>+0.8</sup> <sub>-0.7</sub> ± 0.3		<sup>2</sup> WEI	09A BELL	$e^+e^- \rightarrow \Upsilon(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
4.36 ± 0.15 ± 0.18		<sup>3</sup> AAIJ	13H LHCb	Repl. by AAIJ 14M
3.1 <sup>+1.5</sup> <sub>-1.2</sub> ± 0.3		<sup>2</sup> AUBERT,B	06J BABR	Repl. by AUBERT 09T
0.7 <sup>+1.9</sup> <sub>-1.1</sub> ± 0.2		<sup>2</sup> AUBERT	03U BABR	Repl. by AUBERT,B 06J
4.5 <sup>+1.4</sup> <sub>-1.2</sub> ± 0.3		<sup>4</sup> ISHIKAWA	03 BELL	Repl. by WEI 09A
9.8 <sup>+4.6</sup> <sub>-3.6</sub> ± 1.6		<sup>2</sup> ABE	02 BELL	Repl. by ISHIKAWA 03
< 12	90	<sup>2</sup> AUBERT	02L BABR	$e^+e^- \rightarrow \Upsilon(4S)$
< 36.8	90	<sup>5</sup> ANDERSON	01B CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
< 52	90	<sup>6</sup> AFFOLDER	99B CDF	$p\bar{p}$ at 1.8 TeV
< 100	90	<sup>7</sup> ABE	96L CDF	Repl. by AFFOLDER 99B
< 2400	90	<sup>8</sup> ALBRECHT	91E ARG	$e^+e^- \rightarrow \Upsilon(4S)$
< 64000	90	<sup>9</sup> WEIR	90B MRK2	$e^+e^-$ 29 GeV
< 1700	90	<sup>10</sup> AVERY	89B CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
< 3800	90	<sup>11</sup> AVERY	87 CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

- <sup>1</sup> Uses  $B(B^+ \rightarrow J/\psi(1S)K^+) = (0.998 \pm 0.014 \pm 0.040) \times 10^{-3}$  for normalization.
- <sup>2</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .
- <sup>3</sup> Uses  $B(B^+ \rightarrow J/\psi K^+ \rightarrow \mu^+ \mu^- K^+) = (6.01 \pm 0.21) \times 10^{-5}$ .
- <sup>4</sup> Assumes equal production of  $B^0$  and  $B^+$  at  $\Upsilon(4S)$ . The second error is a total of systematic uncertainties including model dependence.
- <sup>5</sup> The result is for di-lepton masses above 0.5 GeV.
- <sup>6</sup> AFFOLDER 99B measured relative to  $B^+ \rightarrow J/\psi(1S)K^+$ .
- <sup>7</sup> ABE 96L measured relative to  $B^+ \rightarrow J/\psi(1S)K^+$  using PDG 94 branching ratios.
- <sup>8</sup> ALBRECHT 91E reports  $< 2.2 \times 10^{-4}$  assuming the  $\Upsilon(4S)$  decays 45% to  $B^0\bar{B}^0$ . We rescale to 50%.
- <sup>9</sup> WEIR 90B assumes  $B^+$  production cross section from LUND.
- <sup>10</sup> AVERY 89B reports  $< 1.5 \times 10^{-4}$  assuming the  $\Upsilon(4S)$  decays 43% to  $B^0\bar{B}^0$ . We rescale to 50%.
- <sup>11</sup> AVERY 87 reports  $< 3.2 \times 10^{-4}$  assuming the  $\Upsilon(4S)$  decays 40% to  $B^0\bar{B}^0$ . We rescale to 50%.

$\Gamma(K^+ \mu^+ \mu^-) / \Gamma(J/\psi(1S)K^+)$   $\Gamma_{516} / \Gamma_{255}$

<u>VALUE (units <math>10^{-3}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.431 ± 0.025 OUR FIT</b> Error includes scale factor of 1.2.			
<b>0.46 ± 0.04 ± 0.02</b>	AALTONEN	11AI CDF	$p\bar{p}$ at 1.96 TeV
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
0.38 ± 0.05 ± 0.02	AALTONEN	11L CDF	Repl. by AALTONEN 11AI
0.59 ± 0.15 ± 0.03	AALTONEN	09B CDF	Repl. by AALTONEN 11L



$\Gamma(K^+\bar{\nu})/\Gamma_{\text{total}}$   $\Gamma_{517}/\Gamma$

Test for  $\Delta B=1$  weak neutral current. Allowed by higher-order electroweak interactions.

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<1.6 \times 10^{-5}$	90	<sup>1,2</sup> LEES	13I BABR	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$<5.5 \times 10^{-5}$	90	<sup>1</sup> LUTZ	13 BELL	$e^+e^- \rightarrow \Upsilon(4S)$
$<1.3 \times 10^{-5}$	90	<sup>1</sup> DEL-AMO-SALDADO	BABR	Repl. by LEES 13I
$<1.4 \times 10^{-5}$	90	<sup>1</sup> CHEN	07D BELL	$e^+e^- \rightarrow \Upsilon(4S)$
$<5.2 \times 10^{-5}$	90	<sup>1</sup> AUBERT	05H BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$<2.4 \times 10^{-4}$	90	<sup>1</sup> BROWDER	01 CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> Also reported a limit  $< 3.7 \times 10^{-5}$  at 90% CL obtained using a fully reconstructed hadronic  $B$ -tag events.

$\Gamma(\rho^+\nu\bar{\nu})/\Gamma_{\text{total}}$   $\Gamma_{518}/\Gamma$

Test for  $\Delta B=1$  weak neutral current. Allowed by higher-order electroweak interaction.

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<2.13 \times 10^{-4}$	90	<sup>1</sup> LUTZ	13 BELL	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$<1.5 \times 10^{-4}$	90	<sup>1</sup> CHEN	07D BELL	Repl. by LUTZ 13

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(K^*(892)^+\ell^+\ell^-)/\Gamma_{\text{total}}$   $\Gamma_{519}/\Gamma$

Test for  $\Delta B=1$  weak neutral current. Allowed by higher-order electroweak interactions.

VALUE (units $10^{-7}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>10.1 ± 1.1 OUR AVERAGE</b>				Error includes scale factor of 1.1.
$9.24 \pm 0.93 \pm 0.67$		AAIJ	14M LHCb	$pp$ at 7, 8 TeV
$14.0^{+4.0}_{-3.7} \pm 0.9$		<sup>1</sup> AUBERT	09T BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$12.4^{+2.3}_{-2.1} \pm 1.3$		<sup>1</sup> WEI	09A BELL	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$11.6 \pm 1.9$		<sup>2</sup> AAIJ	12AH LHCb	Repl. by AAIJ 14M
$7.3^{+5.0}_{-4.2} \pm 2.1$		<sup>1</sup> AUBERT,B	06J BABR	Repl. by AUBERT 09T
$<22$	90	<sup>1</sup> ISHIKAWA	03 BELL	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> Measured in  $B^+ \rightarrow K^*(892)^+\mu^+\mu^-$  decays.

$\Gamma(K^*(892)^+e^+e^-)/\Gamma_{\text{total}}$   $\Gamma_{520}/\Gamma$

Test for  $\Delta B=1$  weak neutral current. Allowed by higher-order electroweak interactions.

VALUE (units $10^{-7}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>15.5<sup>+</sup><sub>-</sub> 4.0 3.1 OUR AVERAGE</b>				
$13.8^{+4.7}_{-4.2} \pm 0.8$		<sup>1</sup> AUBERT	09T BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$17.3^{+5.0}_{-4.2} \pm 2.0$		<sup>1</sup> WEI	09A BELL	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$7.5_{-}^{+} \frac{7.6}{6.5} \pm 3.8$		<sup>1</sup> AUBERT,B	06J	BABR	Repl. by AUBERT 09T
$2.0_{-}^{+} \frac{13.4}{8.7} \pm 2.8$		<sup>1</sup> AUBERT	03U	BABR	$e^{+}e^{-} \rightarrow \Upsilon(4S)$
< 46	90	<sup>2</sup> ISHIKAWA	03	BELL	$e^{+}e^{-} \rightarrow \Upsilon(4S)$
< 89	90	<sup>1</sup> ABE	02	BELL	Repl. by ISHIKAWA 03
< 95	90	<sup>1</sup> AUBERT	02L	BABR	$e^{+}e^{-} \rightarrow \Upsilon(4S)$
< 6900	90	<sup>3</sup> ALBRECHT	91E	ARG	$e^{+}e^{-} \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^{+}$  and  $B^{0}$  at the  $\Upsilon(4S)$ .

<sup>2</sup> Assumes equal production of  $B^{0}$  and  $B^{+}$  at  $\Upsilon(4S)$ . The second error is a total of systematic uncertainties including model dependence.

<sup>3</sup> ALBRECHT 91E reports  $< 6.3 \times 10^{-4}$  assuming the  $\Upsilon(4S)$  decays 45% to  $B^{0}\bar{B}^{0}$ . We rescale to 50%.

$\Gamma(K^{*}(892)^{+}\mu^{+}\mu^{-})/\Gamma_{\text{total}}$   $\Gamma_{521}/\Gamma$

Test for  $\Delta B=1$  weak neutral current. Allowed by higher-order electroweak interactions.

VALUE (units $10^{-7}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>9.6 ± 1.0 OUR FIT</b>				
<b>9.6 ± 1.1 OUR AVERAGE</b>				
$9.24 \pm 0.93 \pm 0.67$		<sup>1</sup> AAIJ	14M	LHCB $pp$ at 7, 8 TeV
$14.6_{-}^{+} \frac{7.9}{7.5} \pm 1.2$		<sup>2</sup> AUBERT	09T	BABR $e^{+}e^{-} \rightarrow \Upsilon(4S)$
$11.1_{-}^{+} \frac{3.2}{2.7} \pm 1.0$		<sup>2</sup> WEI	09A	BELL $e^{+}e^{-} \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$11.6 \pm 1.9$		AAIJ	12AH	LHCB	Repl. by AAIJ 14M
$9.7_{-}^{+} \frac{9.4}{6.9} \pm 1.4$		<sup>2</sup> AUBERT,B	06J	BABR	Repl. by AUBERT 09T
$30.7_{-}^{+} \frac{25.8}{17.8} \pm 4.2$		<sup>2</sup> AUBERT	03U	BABR	$e^{+}e^{-} \rightarrow \Upsilon(4S)$
$6.5_{-}^{+} \frac{6.9}{5.3} \frac{+1.5}{-1.6}$		<sup>3</sup> ISHIKAWA	03	BELL	Repl. by WEI 09A
< 39	90	<sup>2</sup> ABE	02	BELL	Repl. by ISHIKAWA 03
< 170	90	<sup>2</sup> AUBERT	02L	BABR	$e^{+}e^{-} \rightarrow \Upsilon(4S)$

<sup>1</sup> Uses  $B(B^{+} \rightarrow J/\psi(1S)K^{*}(892)^{+}) = (1.431 \pm 0.027 \pm 0.090) \times 10^{-3}$  for normalization.

<sup>2</sup> Assumes equal production of  $B^{+}$  and  $B^{0}$  at the  $\Upsilon(4S)$ .

<sup>3</sup> Assumes equal production of  $B^{0}$  and  $B^{+}$  at  $\Upsilon(4S)$ . The second error is a total of systematic uncertainties including model dependence. The 90% C.L. upper limit is  $2.2 \times 10^{-6}$ .

$\Gamma(K^{*}(892)^{+}\mu^{+}\mu^{-})/\Gamma(J/\psi(1S)K^{*}(892)^{+})$   $\Gamma_{521}/\Gamma_{260}$

VALUE (units $10^{-3}$ )	DOCUMENT ID	TECN	COMMENT
<b>0.67 ± 0.08 OUR FIT</b>			
<b>0.67 ± 0.22 ± 0.04</b>	AALTONEN	11A1	CDF $p\bar{p}$ at 1.96 TeV

$\Gamma(K^{*}(892)^{+}\nu\bar{\nu})/\Gamma_{\text{total}}$   $\Gamma_{522}/\Gamma$

Test for  $\Delta B=1$  weak neutral current. Allowed by higher-order electroweak interaction.

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt; 4.0 × 10<sup>-5</sup></b>	90	<sup>1</sup> LUTZ	13	BELL $e^{+}e^{-} \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$<6.4 \times 10^{-5}$	90	<sup>1,2</sup> LEES	13I BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$<8 \times 10^{-5}$	90	AUBERT	08BC BABR	Repl. by LEES 13I
$<1.4 \times 10^{-4}$	90	<sup>1</sup> CHEN	07D BELL	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> Also reported a limit  $< 11.6 \times 10^{-5}$  at 90% CL obtained using a fully reconstructed hadronic  $B$ -tag events.

$\Gamma(K^+\pi^+\pi^-\mu^+\mu^-)/\Gamma(\psi(2S)K^+)$   $\Gamma_{523}/\Gamma_{283}$

<u>VALUE (units <math>10^{-4}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$6.95^{+0.46}_{-0.43} \pm 0.34$	AAIJ	14AZ LHCb	$pp$ at 7, 8 TeV

$\Gamma(\phi K^+\mu^+\mu^-)/\Gamma(J/\psi(1S)\phi K^+)$   $\Gamma_{524}/\Gamma_{267}$

<u>VALUE (units <math>10^{-3}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$1.58^{+0.36+0.19}_{-0.32-0.07}$	AAIJ	14AZ LHCb	$pp$ at 7, 8 TeV

$\Gamma(\pi^+e^+\mu^-)/\Gamma_{\text{total}}$   $\Gamma_{525}/\Gamma$

Test of lepton family number conservation.

<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$<0.0064$	90	<sup>1</sup> WEIR	90B MRK2	$e^+e^-$ 29 GeV

<sup>1</sup> WEIR 90B assumes  $B^+$  production cross section from LUND.

$\Gamma(\pi^+e^-\mu^+)/\Gamma_{\text{total}}$   $\Gamma_{526}/\Gamma$

Test of lepton family number conservation.

<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$<0.0064$	90	<sup>1</sup> WEIR	90B MRK2	$e^+e^-$ 29 GeV

<sup>1</sup> WEIR 90B assumes  $B^+$  production cross section from LUND.

$\Gamma(\pi^+e^\pm\mu^\mp)/\Gamma_{\text{total}}$   $\Gamma_{527}/\Gamma$

<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$<1.7 \times 10^{-7}$	90	<sup>1</sup> AUBERT	07AG BABR	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\pi^+e^+\tau^-)/\Gamma_{\text{total}}$   $\Gamma_{528}/\Gamma$

Test of lepton family number conservation.

<u>VALUE (units <math>10^{-6}</math>)</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$<74$	90	<sup>1</sup> LEES	12P BABR	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Uses a fully reconstructed hadronic  $B$  decay as a tag on the recoil side.

$\Gamma(\pi^+e^-\tau^+)/\Gamma_{\text{total}}$   $\Gamma_{529}/\Gamma$

Test of lepton family number conservation.

<u>VALUE (units <math>10^{-6}</math>)</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$<20$	90	<sup>1</sup> LEES	12P BABR	$e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Uses a fully reconstructed hadronic  $B$  decay as a tag on the recoil side.

$\Gamma(\pi^+ e^\pm \tau^\mp)/\Gamma_{\text{total}}$   $\Gamma_{530}/\Gamma$

Test of lepton family number conservation.

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<75	90	1,2 LEES	12P BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes  $B(B^+ \rightarrow h^+ \ell^+ \tau^-) = B(B^+ \rightarrow h^+ \ell^- \tau^+)$ .

<sup>2</sup> Uses a fully reconstructed hadronic  $B$  decay as a tag on the recoil side.

$\Gamma(\pi^+ \mu^+ \tau^-)/\Gamma_{\text{total}}$   $\Gamma_{531}/\Gamma$

Test of lepton family number conservation.

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<62	90	<sup>1</sup> LEES	12P BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Uses a fully reconstructed hadronic  $B$  decay as a tag on the recoil side.

$\Gamma(\pi^+ \mu^- \tau^+)/\Gamma_{\text{total}}$   $\Gamma_{532}/\Gamma$

Test of lepton family number conservation.

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<45	90	<sup>1</sup> LEES	12P BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Uses a fully reconstructed hadronic  $B$  decay as a tag on the recoil side.

$\Gamma(\pi^+ \mu^\pm \tau^\mp)/\Gamma_{\text{total}}$   $\Gamma_{533}/\Gamma$

Test of lepton family number conservation.

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<72	90	1,2 LEES	12P BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes  $B(B^+ \rightarrow h^+ \ell^+ \tau^-) = B(B^+ \rightarrow h^+ \ell^- \tau^+)$ .

<sup>2</sup> Uses a fully reconstructed hadronic  $B$  decay as a tag on the recoil side.

$\Gamma(K^+ e^+ \mu^-)/\Gamma_{\text{total}}$   $\Gamma_{534}/\Gamma$

Test of lepton family number conservation.

VALUE (units $10^{-7}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<0.91	90	<sup>1</sup> AUBERT,B	06J BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

••• We do not use the following data for averages, fits, limits, etc. •••

<8	90	<sup>1</sup> AUBERT	02L BABR	Repl. by AUBERT,B 06J
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<6.4 $\times 10^4$	90	<sup>2</sup> WEIR	90B MRK2	$e^+ e^-$ 29 GeV
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> WEIR 90B assumes  $B^+$  production cross section from LUND.

$\Gamma(K^+ e^- \mu^+)/\Gamma_{\text{total}}$   $\Gamma_{535}/\Gamma$

Test of lepton family number conservation.

VALUE (units $10^{-7}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<1.3	90	<sup>1</sup> AUBERT,B	06J BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

••• We do not use the following data for averages, fits, limits, etc. •••

<6.4 $\times 10^4$	90	<sup>2</sup> WEIR	90B MRK2	$e^+ e^-$ 29 GeV
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> WEIR 90B assumes  $B^+$  production cross section from LUND.

$\Gamma(K^+ e^\pm \mu^\mp)/\Gamma_{\text{total}}$   $\Gamma_{536}/\Gamma$

VALUE (units $10^{-7}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<0.91	90	<sup>1</sup> AUBERT,B	06J BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(K^+ e^+ \tau^-)/\Gamma_{\text{total}}$   $\Gamma_{537}/\Gamma$

Test of lepton family number conservation.

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<43	90	<sup>1</sup> LEES	12P BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Uses a fully reconstructed hadronic  $B$  decay as a tag on the recoil side.

$\Gamma(K^+ e^- \tau^+)/\Gamma_{\text{total}}$   $\Gamma_{538}/\Gamma$

Test of lepton family number conservation.

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<15	90	<sup>1</sup> LEES	12P BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Uses a fully reconstructed hadronic  $B$  decay as a tag on the recoil side.

$\Gamma(K^+ e^\pm \tau^\mp)/\Gamma_{\text{total}}$   $\Gamma_{539}/\Gamma$

Test of lepton family number conservation.

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<30	90	<sup>1,2</sup> LEES	12P BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes  $B(B^+ \rightarrow h^+ \ell^+ \tau^-) = B(B^+ \rightarrow h^+ \ell^- \tau^+)$ .

<sup>2</sup> Uses a fully reconstructed hadronic  $B$  decay as a tag on the recoil side.

$\Gamma(K^+ \mu^+ \tau^-)/\Gamma_{\text{total}}$   $\Gamma_{540}/\Gamma$

Test of lepton family number conservation.

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<45	90	<sup>1</sup> LEES	12P BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Uses a fully reconstructed hadronic  $B$  decay as a tag on the recoil side.

$\Gamma(K^+ \mu^- \tau^+)/\Gamma_{\text{total}}$   $\Gamma_{541}/\Gamma$

Test of lepton family number conservation.

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<28	90	<sup>1</sup> LEES	12P BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Uses a fully reconstructed hadronic  $B$  decay as a tag on the recoil side.

$\Gamma(K^+ \mu^\pm \tau^\mp)/\Gamma_{\text{total}}$   $\Gamma_{542}/\Gamma$

Test of lepton family number conservation.

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<48	90	<sup>1,2</sup> LEES	12P BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

<77	90	<sup>1</sup> AUBERT	07AZ BABR	Repl. by LEES 12P
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<sup>1</sup> Uses a fully reconstructed hadronic  $B$  decay as a tag on the recoil side.

<sup>2</sup> Assumes  $B(B^+ \rightarrow h^+ \ell^+ \tau^-) = B(B^+ \rightarrow h^+ \ell^- \tau^+)$ .

$\Gamma(K^*(892)^+ e^+ \mu^-)/\Gamma_{\text{total}}$   $\Gamma_{543}/\Gamma$

VALUE (units $10^{-7}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<13	90	<sup>1</sup> AUBERT,B	06J BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(K^*(892)^+ e^- \mu^+)/\Gamma_{\text{total}}$   $\Gamma_{544}/\Gamma$

VALUE (units $10^{-7}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<9.9	90	<sup>1</sup> AUBERT,B	06J BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(K^*(892)^+ e^\pm \mu^\mp)/\Gamma_{\text{total}}$   $\Gamma_{545}/\Gamma$

Test of lepton family number conservation.

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<1.4 $\times 10^{-6}$	90	<sup>1</sup> AUBERT,B	06J BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

<7.9 $\times 10^{-6}$	90	<sup>1</sup> AUBERT	02L BABR	Repl. by AUBERT,B 06J
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<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

$\Gamma(\pi^- e^+ e^+)/\Gamma_{\text{total}}$   $\Gamma_{546}/\Gamma$

Test of total lepton number conservation.

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<2.3 $\times 10^{-8}$	90	<sup>1</sup> LEES	12J BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

<1.6 $\times 10^{-6}$	90	<sup>1</sup> EDWARDS	02B CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$
<0.0039	90	<sup>2</sup> WEIR	90B MRK2	$e^+ e^-$ 29 GeV

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>2</sup> WEIR 90B assumes  $B^+$  production cross section from LUND.

$\Gamma(\pi^- \mu^+ \mu^+)/\Gamma_{\text{total}}$   $\Gamma_{547}/\Gamma$

Test of total lepton number conservation.

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
< 4.0 $\times 10^{-9}$	95	<sup>1</sup> AAIJ	14AC LHCB	$pp$ at 7, 8 TeV

• • • We do not use the following data for averages, fits, limits, etc. • • •

< 1.3 $\times 10^{-8}$	95	<sup>2</sup> AAIJ	12AD LHCB	Repl. by AAIJ 14AC
< 4.4 $\times 10^{-8}$	90	AAIJ	12C LHCB	$pp$ at 7 TeV
<10.7 $\times 10^{-8}$	90	<sup>3</sup> LEES	12J BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
< 1.4 $\times 10^{-6}$	90	<sup>3</sup> EDWARDS	02B CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$
< 9.1 $\times 10^{-3}$	90	<sup>4</sup> WEIR	90B MRK2	$e^+ e^-$ 29 GeV

<sup>1</sup> Uses  $B^+ \rightarrow J/\psi K^+$ ,  $J/\psi \rightarrow \mu^+ \mu^-$  mode for normalization. Obtains neutrino-mass-dependent upper limits in the range  $0.4\text{--}4.0 \times 10^{-9}$ . This limit is applicable for Majorana neutrino lifetime  $< 1$  ps.

<sup>2</sup> Uses  $B^+ \rightarrow J/\psi K^+$ ,  $J/\psi \rightarrow \mu^+ \mu^-$  mode for normalization. Obtains neutrino-mass-dependent upper limits in the range  $0.4\text{--}1.0 \times 10^{-8}$ .

<sup>3</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .

<sup>4</sup> WEIR 90B assumes  $B^+$  production cross section from LUND.

$\Gamma(\pi^- e^+ \mu^+)/\Gamma_{\text{total}}$   $\Gamma_{548}/\Gamma$ 

Test of total lepton number conservation.

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;1.5</b> $\times 10^{-7}$	90	<sup>1</sup> LEES	14A BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
<1.3 $\times 10^{-6}$	90	<sup>1</sup> EDWARDS	02B CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$
<0.0064	90	<sup>2</sup> WEIR	90B MRK2	$e^+ e^-$ 29 GeV

• • • We do not use the following data for averages, fits, limits, etc. • • •

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .<sup>2</sup> WEIR 90B assumes  $B^+$  production cross section from LUND. $\Gamma(\rho^- e^+ e^+)/\Gamma_{\text{total}}$   $\Gamma_{549}/\Gamma$ 

Test of total lepton number conservation.

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;0.17</b>	90	<sup>1</sup> LEES	14A BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
<2.6	90	<sup>1</sup> EDWARDS	02B CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ . $\Gamma(\rho^- \mu^+ \mu^+)/\Gamma_{\text{total}}$   $\Gamma_{550}/\Gamma$ 

Test of total lepton number conservation.

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;0.42</b>	90	LEES	14A BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
<5.0	90	<sup>1</sup> EDWARDS	02B CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ . $\Gamma(\rho^- e^+ \mu^+)/\Gamma_{\text{total}}$   $\Gamma_{551}/\Gamma$ 

Test of total lepton number conservation.

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;0.47</b>	90	<sup>1</sup> LEES	14A BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
<3.3	90	<sup>1</sup> EDWARDS	02B CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ . $\Gamma(K^- e^+ e^+)/\Gamma_{\text{total}}$   $\Gamma_{552}/\Gamma$ 

Test of total lepton number conservation.

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;3.0</b> $\times 10^{-8}$	90	<sup>1</sup> LEES	12J BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
<1.0 $\times 10^{-6}$	90	<sup>1</sup> EDWARDS	02B CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$
<0.0039	90	<sup>2</sup> WEIR	90B MRK2	$e^+ e^-$ 29 GeV

• • • We do not use the following data for averages, fits, limits, etc. • • •

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .<sup>2</sup> WEIR 90B assumes  $B^+$  production cross section from LUND.

$\Gamma(K^-\mu^+\mu^+)/\Gamma_{\text{total}}$   $\Gamma_{553}/\Gamma$ 

Test of total lepton number conservation.

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<4.1 \times 10^{-8}$	90	AAIJ	12C	LHCB $pp$ at 7 TeV
$<6.7 \times 10^{-8}$	90	<sup>1</sup> LEES	12J	BABR $e^+e^- \rightarrow \Upsilon(4S)$
$<1.8 \times 10^{-6}$	90	<sup>1</sup> EDWARDS	02B	CLE2 $e^+e^- \rightarrow \Upsilon(4S)$
$<9.1 \times 10^{-3}$	90	<sup>2</sup> WEIR	90B	MRK2 $e^+e^-$ 29 GeV

• • • We do not use the following data for averages, fits, limits, etc. • • •

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .<sup>2</sup> WEIR 90B assumes  $B^+$  production cross section from LUND. $\Gamma(K^-e^+\mu^+)/\Gamma_{\text{total}}$   $\Gamma_{554}/\Gamma$ 

Test of total lepton number conservation.

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<1.6 \times 10^{-7}$	90	<sup>1</sup> LEES	14A	BABR $e^+e^- \rightarrow \Upsilon(4S)$
$<2.0 \times 10^{-6}$	90	<sup>1</sup> EDWARDS	02B	CLE2 $e^+e^- \rightarrow \Upsilon(4S)$
$<0.0064$	90	<sup>2</sup> WEIR	90B	MRK2 $e^+e^-$ 29 GeV

• • • We do not use the following data for averages, fits, limits, etc. • • •

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .<sup>2</sup> WEIR 90B assumes  $B^+$  production cross section from LUND. $\Gamma(K^*(892)^-e^+e^+)/\Gamma_{\text{total}}$   $\Gamma_{555}/\Gamma$ 

Test of total lepton number conservation.

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
$<0.40$	90	<sup>1</sup> LEES	14A	BABR $e^+e^- \rightarrow \Upsilon(4S)$
$<2.8$	90	<sup>1</sup> EDWARDS	02B	CLE2 $e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ . $\Gamma(K^*(892)^-\mu^+\mu^+)/\Gamma_{\text{total}}$   $\Gamma_{556}/\Gamma$ 

Test of total lepton number conservation.

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
$<0.59$	90	<sup>1</sup> LEES	14A	BABR $e^+e^- \rightarrow \Upsilon(4S)$
$<8.3$	90	<sup>1</sup> EDWARDS	02B	CLE2 $e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ . $\Gamma(K^*(892)^-e^+\mu^+)/\Gamma_{\text{total}}$   $\Gamma_{557}/\Gamma$ 

Test of total lepton number conservation.

VALUE (units $10^{-6}$ )	CL%	DOCUMENT ID	TECN	COMMENT
$<0.30$	90	<sup>1</sup> LEES	14A	BABR $e^+e^- \rightarrow \Upsilon(4S)$
$<4.4$	90	<sup>1</sup> EDWARDS	02B	CLE2 $e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

<sup>1</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ .



$\Gamma(D^- e^+ e^+)/\Gamma_{\text{total}}$   $\Gamma_{558}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<2.6 \times 10^{-6}$	90	<sup>1</sup> LEES	14A BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
$<2.6 \times 10^{-6}$	90	<sup>1,2</sup> SEON	11 BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Assumes equal production of  $B^0$  and  $B^+$  from Upsilon(4S) decays.

<sup>2</sup> Uses  $D^- \rightarrow K^+ \pi^- \pi^-$  mode and 3-body phase-space hypothesis for the signal decays.

$\Gamma(D^- e^+ \mu^+)/\Gamma_{\text{total}}$   $\Gamma_{559}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<1.8 \times 10^{-6}$	90	<sup>1,2</sup> SEON	11 BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$<2.1 \times 10^{-6}$	90	<sup>1</sup> LEES	14A BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Assumes equal production of  $B^0$  and  $B^+$  from Upsilon(4S) decays.

<sup>2</sup> Uses  $D^- \rightarrow K^+ \pi^- \pi^-$  mode and 3-body phase-space hypothesis for the signal decays.

$\Gamma(D^- \mu^+ \mu^+)/\Gamma_{\text{total}}$   $\Gamma_{560}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$< 6.9 \times 10^{-7}$	95	<sup>1</sup> AAIJ	12AD LHCB	$pp$ at 7 TeV

• • • We do not use the following data for averages, fits, limits, etc. • • •

$<17 \times 10^{-7}$	90	<sup>2</sup> LEES	14A BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
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$< 1.1 \times 10^{-6}$	90	<sup>2,3</sup> SEON	11 BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
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<sup>1</sup> Uses  $B^+ \rightarrow \psi(2S) K^+$ ,  $\psi(2S) \rightarrow J/\psi \pi^+ \pi^-$  mode for normalization.

<sup>2</sup> Assumes equal production of  $B^0$  and  $B^+$  from Upsilon(4S) decays.

<sup>3</sup> Uses  $D^- \rightarrow K^+ \pi^- \pi^-$  mode and 3-body phase-space hypothesis for the signal decays.

$\Gamma(D^{*-} \mu^+ \mu^+)/\Gamma_{\text{total}}$   $\Gamma_{561}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<2.4 \times 10^{-6}$	95	<sup>1</sup> AAIJ	12AD LHCB	$pp$ at 7 TeV

<sup>1</sup> Uses  $B^+ \rightarrow \psi(2S) K^+$ ,  $\psi(2S) \rightarrow J/\psi \pi^+ \pi^-$  mode for normalization.

$\Gamma(D_s^- \mu^+ \mu^+)/\Gamma_{\text{total}}$   $\Gamma_{562}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<5.8 \times 10^{-7}$	95	<sup>1</sup> AAIJ	12AD LHCB	$pp$ at 7 TeV

<sup>1</sup> Uses  $B^+ \rightarrow \psi(2S) K^+$ ,  $\psi(2S) \rightarrow J/\psi \pi^+ \pi^-$  mode for normalization. Obtains neutrino-mass-dependent upper limits in the range  $1.5\text{--}8.0 \times 10^{-7}$ .

$\Gamma(\bar{D}^0 \pi^- \mu^+ \mu^+)/\Gamma_{\text{total}}$   $\Gamma_{563}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<1.5 \times 10^{-6}$	95	<sup>1</sup> AAIJ	12AD LHCB	$pp$ at 7 TeV

<sup>1</sup> Uses  $B^+ \rightarrow \psi(2S) K^+$ ,  $\psi(2S) \rightarrow J/\psi \pi^+ \pi^-$  mode for normalization. Obtains neutrino-mass-dependent upper limits in the range  $0.3\text{--}1.5 \times 10^{-6}$ .

$\Gamma(\Lambda^0 \mu^+)/\Gamma_{\text{total}}$   $\Gamma_{564}/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<6 \times 10^{-8}$	90	<sup>1,2</sup> DEL-AMO-SA..11K	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> DEL-AMO-SANCHEZ 11K reports  $< 6.1 \times 10^{-8}$  from a measurement of  $[\Gamma(B^+ \rightarrow \Lambda^0 \mu^+)/\Gamma_{\text{total}}] \times [B(\Lambda \rightarrow p \pi^-)]$  assuming  $B(\Lambda \rightarrow p \pi^-) = (63.9 \pm 0.5) \times 10^{-2}$ .

<sup>2</sup> Uses  $B(\Upsilon(4S) \rightarrow B^0 \bar{B}^0) = (51.6 \pm 0.6)\%$  and  $B(\Upsilon(4S) \rightarrow B^+ B^-) = (48.4 \pm 0.6)\%$ .

$\Gamma(\Lambda^0 e^+)/\Gamma_{\text{total}}$   $\Gamma_{565}/\Gamma$ 

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<3.2 \times 10^{-8}$	90	1,2 DEL-AMO-SA..11k	BABR	$e^+e^- \rightarrow \gamma(4S)$
<sup>1</sup> DEL-AMO-SANCHEZ 11k reports $< 3.2 \times 10^{-8}$ from a measurement of $[\Gamma(B^+ \rightarrow \Lambda^0 e^+)/\Gamma_{\text{total}}] \times [B(\Lambda \rightarrow p\pi^-)]$ assuming $B(\Lambda \rightarrow p\pi^-) = (63.9 \pm 0.5) \times 10^{-2}$ . <sup>2</sup> Uses $B(\gamma(4S) \rightarrow B^0 \bar{B}^0) = (51.6 \pm 0.6)\%$ and $B(\gamma(4S) \rightarrow B^+ B^-) = (48.4 \pm 0.6)\%$ .				

 $\Gamma(\bar{\Lambda}^0 \mu^+)/\Gamma_{\text{total}}$   $\Gamma_{566}/\Gamma$ 

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<6 \times 10^{-8}$	90	1,2 DEL-AMO-SA..11k	BABR	$e^+e^- \rightarrow \gamma(4S)$
<sup>1</sup> DEL-AMO-SANCHEZ 11k reports $< 6.2 \times 10^{-8}$ from a measurement of $[\Gamma(B^+ \rightarrow \bar{\Lambda}^0 \mu^+)/\Gamma_{\text{total}}] \times [B(\Lambda \rightarrow p\pi^-)]$ assuming $B(\Lambda \rightarrow p\pi^-) = (63.9 \pm 0.5) \times 10^{-2}$ . <sup>2</sup> Uses $B(\gamma(4S) \rightarrow B^0 \bar{B}^0) = (51.6 \pm 0.6)\%$ and $B(\gamma(4S) \rightarrow B^+ B^-) = (48.4 \pm 0.6)\%$ .				

 $\Gamma(\bar{\Lambda}^0 e^+)/\Gamma_{\text{total}}$   $\Gamma_{567}/\Gamma$ 

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<8 \times 10^{-8}$	90	1,2 DEL-AMO-SA..11k	BABR	$e^+e^- \rightarrow \gamma(4S)$
<sup>1</sup> DEL-AMO-SANCHEZ 11k reports $< 8.1 \times 10^{-8}$ from a measurement of $[\Gamma(B^+ \rightarrow \bar{\Lambda}^0 e^+)/\Gamma_{\text{total}}] \times [B(\Lambda \rightarrow p\pi^-)]$ assuming $B(\Lambda \rightarrow p\pi^-) = (63.9 \pm 0.5) \times 10^{-2}$ . <sup>2</sup> Uses $B(\gamma(4S) \rightarrow B^0 \bar{B}^0) = (51.6 \pm 0.6)\%$ and $B(\gamma(4S) \rightarrow B^+ B^-) = (48.4 \pm 0.6)\%$ .				

## POLARIZATION IN $B^+$ DECAY

In decays involving two vector mesons, one can distinguish among the states in which meson polarizations are both longitudinal ( $L$ ) or both are transverse and parallel ( $\parallel$ ) or perpendicular ( $\perp$ ) to each other with the parameters  $\Gamma_L/\Gamma$ ,  $\Gamma_{\perp}/\Gamma$ , and the relative phases  $\phi_{\parallel}$  and  $\phi_{\perp}$ . See the definitions in the note on "Polarization in  $B$  Decays" review in the  $B^0$  Particle Listings.

 $\Gamma_L/\Gamma$  in  $B^+ \rightarrow \bar{D}^{*0} \rho^+$ 

VALUE	DOCUMENT ID	TECN	COMMENT
$0.892 \pm 0.018 \pm 0.016$	CSORNA 03	CLE2	$e^+e^- \rightarrow \gamma(4S)$

 $\Gamma_L/\Gamma$  in  $B^+ \rightarrow \bar{D}^{*0} K^{*+}$ 

VALUE	DOCUMENT ID	TECN	COMMENT
$0.86 \pm 0.06 \pm 0.03$	AUBERT 04k	BABR	$e^+e^- \rightarrow \gamma(4S)$

 $\Gamma_L/\Gamma$  in  $B^+ \rightarrow J/\psi K^{*+}$ 

VALUE	DOCUMENT ID	TECN	COMMENT
$0.604 \pm 0.015 \pm 0.018$	ITOH 05	BELL	$e^+e^- \rightarrow \gamma(4S)$

 $\Gamma_{\perp}/\Gamma$  in  $B^+ \rightarrow J/\psi K^{*+}$ 

VALUE	DOCUMENT ID	TECN	COMMENT
$0.180 \pm 0.014 \pm 0.010$	ITOH 05	BELL	$e^+e^- \rightarrow \gamma(4S)$

 $\Gamma_L/\Gamma$  in  $B^+ \rightarrow \omega K^{*+}$ 

VALUE	DOCUMENT ID	TECN	COMMENT
$0.41 \pm 0.18 \pm 0.05$	AUBERT 09H	BABR	$e^+e^- \rightarrow \gamma(4S)$

$\Gamma_L/\Gamma$  in  $B^+ \rightarrow \omega K_2^*(1430)^+$ 

VALUE	DOCUMENT ID	TECN	COMMENT
<b><math>0.56 \pm 0.10 \pm 0.04</math></b>	AUBERT	09H BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

 $\Gamma_L/\Gamma$  in  $B^+ \rightarrow K^{*+} \bar{K}^{*0}$ 

VALUE	DOCUMENT ID	TECN	COMMENT
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 **$0.82^{+0.15}_{-0.21}$  OUR AVERAGE**

$1.06 \pm 0.30 \pm 0.14$	<sup>1</sup> GOH	15 BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
$0.75^{+0.16}_{-0.26} \pm 0.03$	<sup>2,3</sup> AUBERT	09F BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Signal significance 2.7 standard deviations.<sup>2</sup> Signal significance 3.7 standard deviations.<sup>3</sup> Assumes equal production of  $B^+$  and  $B^0$  at the  $\Upsilon(4S)$ . $\Gamma_L/\Gamma$  in  $B^+ \rightarrow \phi K^*(892)^+$ 

VALUE	DOCUMENT ID	TECN	COMMENT
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 **$0.50 \pm 0.05$  OUR AVERAGE**

$0.49 \pm 0.05 \pm 0.03$	AUBERT	07BA BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
$0.52 \pm 0.08 \pm 0.03$	CHEN	05A BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$0.46 \pm 0.12 \pm 0.03$	AUBERT	03V BABR	Repl. by AUBERT 07BA
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 $\Gamma_{\perp}/\Gamma$  in  $B^+ \rightarrow \phi K^{*+}$ 

VALUE	DOCUMENT ID	TECN	COMMENT
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 **$0.20 \pm 0.05$  OUR AVERAGE**

$0.21 \pm 0.05 \pm 0.02$	AUBERT	07BA BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
$0.19 \pm 0.08 \pm 0.02$	CHEN	05A BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

 $\phi_{\parallel}$  in  $B^+ \rightarrow \phi K^{*+}$ 

VALUE (°)	DOCUMENT ID	TECN	COMMENT
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 **$2.34 \pm 0.18$  OUR AVERAGE**

$2.47 \pm 0.20 \pm 0.07$	AUBERT	07BA BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
$2.10 \pm 0.28 \pm 0.04$	CHEN	05A BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

 $\phi_{\perp}$  in  $B^+ \rightarrow \phi K^{*+}$ 

VALUE (°)	DOCUMENT ID	TECN	COMMENT
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 **$2.58 \pm 0.17$  OUR AVERAGE**

$2.69 \pm 0.20 \pm 0.03$	AUBERT	07BA BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
$2.31 \pm 0.30 \pm 0.07$	CHEN	05A BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

 $\delta_0(B^+ \rightarrow \phi K^{*+})$ 

VALUE (rad)	DOCUMENT ID	TECN	COMMENT
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<b><math>3.07 \pm 0.18 \pm 0.06</math></b>	AUBERT	07BA BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
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 $A_{CP}^0(B^+ \rightarrow \phi K^{*+})$ 

VALUE	DOCUMENT ID	TECN	COMMENT
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<b><math>0.17 \pm 0.11 \pm 0.02</math></b>	AUBERT	07BA BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
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$A_{CP}^\perp(B^+ \rightarrow \phi K^{*+})$ 

VALUE	DOCUMENT ID	TECN	COMMENT
$0.22 \pm 0.24 \pm 0.08$	AUBERT	07BA BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

 $\Delta\phi_{\parallel}(B^+ \rightarrow \phi K^{*+})$ 

VALUE (rad)	DOCUMENT ID	TECN	COMMENT
$0.07 \pm 0.20 \pm 0.05$	AUBERT	07BA BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

 $\Delta\phi_{\perp}(B^+ \rightarrow \phi K^{*+})$ 

VALUE (rad)	DOCUMENT ID	TECN	COMMENT
$0.19 \pm 0.20 \pm 0.07$	AUBERT	07BA BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

 $\Delta\delta_0(B^+ \rightarrow \phi K^{*+})$ 

VALUE (rad)	DOCUMENT ID	TECN	COMMENT
$0.20 \pm 0.18 \pm 0.03$	AUBERT	07BA BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

 $\Gamma_L/\Gamma$  in  $B^+ \rightarrow \phi K_1(1270)^+$ 

VALUE	DOCUMENT ID	TECN	COMMENT
$0.46^{+0.12+0.06}_{-0.13-0.07}$	AUBERT	08BI BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

 $\Gamma_L/\Gamma$  in  $B^+ \rightarrow \phi K_2^*(1430)^+$ 

VALUE	DOCUMENT ID	TECN	COMMENT
$0.80^{+0.09}_{-0.10} \pm 0.03$	AUBERT	08BI BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

 $\delta_0(B^+ \rightarrow \phi K_2^*(1430)^+)$ 

VALUE (rad)	DOCUMENT ID	TECN	COMMENT
$3.59 \pm 0.19 \pm 0.12$	AUBERT	08BI BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

 $\Delta\delta_0(B^+ \rightarrow \phi K_2^*(1430)^+)$ 

VALUE (rad)	DOCUMENT ID	TECN	COMMENT
$-0.05 \pm 0.19 \pm 0.06$	AUBERT	08BI BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

 $\Gamma_L/\Gamma$  in  $B^+ \rightarrow \rho^0 K^*(892)^+$ 

VALUE	DOCUMENT ID	TECN	COMMENT
$0.78 \pm 0.12 \pm 0.03$	DEL-AMO-SA..11D	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$0.96^{+0.04}_{-0.15} \pm 0.04$	AUBERT	03V	BABR	Repl. by DEL-AMO-SANCHEZ 11D
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 $\Gamma_L/\Gamma(B^+ \rightarrow K^*(892)^0 \rho^+)$ 

VALUE	DOCUMENT ID	TECN	COMMENT
<b><math>0.48 \pm 0.08</math> OUR AVERAGE</b>			
$0.52 \pm 0.10 \pm 0.04$	AUBERT,B	06G	BABR $e^+ e^- \rightarrow \Upsilon(4S)$
$0.43 \pm 0.11^{+0.05}_{-0.02}$	ZHANG	05D	BELL $e^+ e^- \rightarrow \Upsilon(4S)$

$\Gamma_L/\Gamma$  in  $B^+ \rightarrow \rho^+ \rho^0$ 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.950±0.016 OUR AVERAGE</b>			
0.950±0.015±0.006	AUBERT	09G BABR	$e^+e^- \rightarrow \Upsilon(4S)$
0.948±0.106±0.021	ZHANG	03B BELL	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.905±0.042 <sup>+0.023</sup> <sub>-0.027</sub>	AUBERT,BE	06G BABR	Repl. by AUBERT 09G
0.97 <sup>+0.03</sup> <sub>-0.07</sub> ±0.04	AUBERT	03V BABR	Repl. by AUBERT,BE 06G

 $\Gamma_L/\Gamma$  in  $B^+ \rightarrow \omega \rho^+$ 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.90±0.05±0.03</b>	AUBERT	09H BABR	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.82±0.11±0.02	AUBERT,B	06T BABR	Repl. by AUBERT 09H
0.88 <sup>+0.12</sup> <sub>-0.15</sub> ±0.03	AUBERT	05o BABR	Repl. by AUBERT,B 06T

 $\Gamma_L/\Gamma$  in  $B^+ \rightarrow p\bar{p}K^*(892)^+$ 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.32±0.17±0.09</b>	CHEN	08C BELL	$e^+e^- \rightarrow \Upsilon(4S)$

**CP VIOLATION**

$A_{CP}$  is defined as

$$\frac{B(B^- \rightarrow \bar{f}) - B(B^+ \rightarrow f)}{B(B^- \rightarrow \bar{f}) + B(B^+ \rightarrow f)},$$

the  $CP$ -violation charge asymmetry of exclusive  $B^-$  and  $B^+$  decay.

 $A_{CP}(B^+ \rightarrow J/\psi(1S)K^+)$ 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.003 ±0.006 OUR AVERAGE</b>	Error includes scale factor of 1.8. See the ideogram below.		
0.0059±0.0036±0.0007	ABAZOV	13M D0	$p\bar{p}$ at 1.96 TeV
-0.0076±0.0050±0.0022	SAKAI	10 BELL	$e^+e^- \rightarrow \Upsilon(4S)$
0.09 ±0.07 ±0.02	<sup>1</sup> WEI	08 BELL	$e^+e^- \rightarrow \Upsilon(4S)$
0.030 ±0.014 ±0.010	<sup>2</sup> AUBERT	05J BABR	$e^+e^- \rightarrow \Upsilon(4S)$
0.018 ±0.043 ±0.004	<sup>3</sup> BONVICINI	00 CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.0075±0.0061±0.0030	<sup>4</sup> ABAZOV	08o D0	Repl. by ABAZOV 13M
0.03 ±0.015 ±0.006	AUBERT	04P BABR	Repl. by AUBERT 05J
-0.026 ±0.022 ±0.017	ABE	03B BELL	Repl. by SAKAI 10
0.003 ±0.030 ±0.004	AUBERT	02F BABR	Repl. by AUBERT 04P

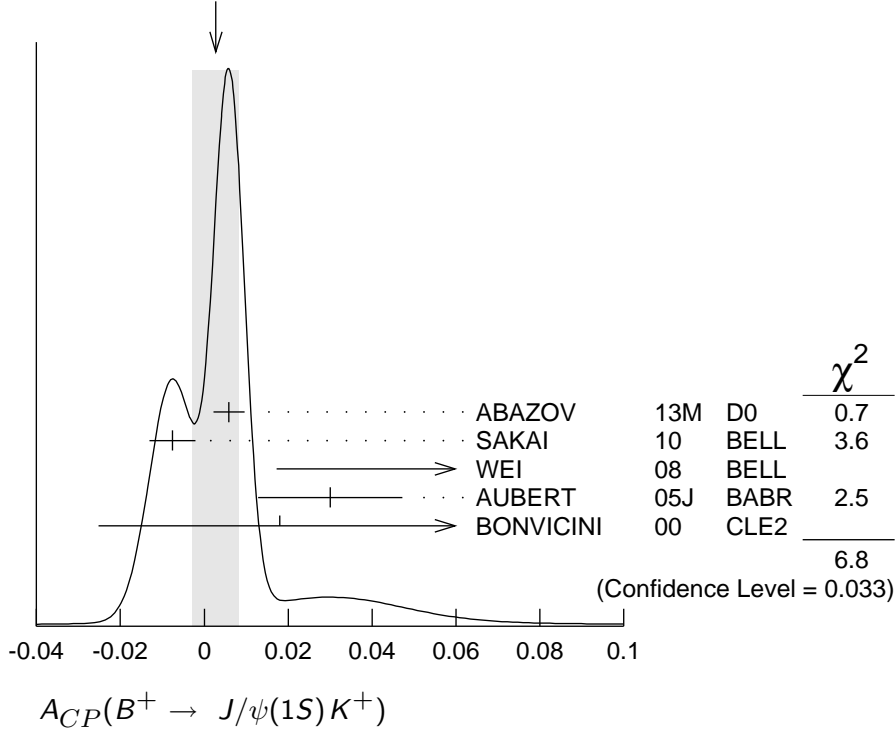
<sup>1</sup> Uses  $B^+ \rightarrow J/\psi K^+$ , where  $J/\psi \rightarrow p\bar{p}$ .

<sup>2</sup> The result reported corresponds to  $-A_{CP}$ .

<sup>3</sup> A +0.3% correction is applied due to a slightly higher reconstruction efficiency for the positive kaons.

<sup>4</sup> Uses  $J/\psi \rightarrow \mu^+ \mu^-$  decay.

WEIGHTED AVERAGE  
 $0.003 \pm 0.006$  (Error scaled by 1.8)



### $A_{CP}(B^+ \rightarrow J/\psi(1S)\pi^+)$

VALUE (units $10^{-2}$ )	DOCUMENT ID	TECN	COMMENT
<b><math>0.1 \pm 2.8</math> OUR AVERAGE</b>	Error includes scale factor of 1.2.		
$-4.2 \pm 4.4 \pm 0.9$	ABAZOV	13M D0	$p\bar{p}$ at 1.96 TeV
$0.5 \pm 2.7 \pm 1.1$	<sup>1</sup> AAIJ	12AC LHCb	$pp$ at 7 TeV
$12.3 \pm 8.5 \pm 0.4$	AUBERT	04P BABR	$e^+e^- \rightarrow \gamma(4S)$
$-2.3 \pm 16.4 \pm 1.5$	ABE	03B BELL	$e^+e^- \rightarrow \gamma(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
$9 \pm 8 \pm 3$	<sup>2</sup> ABAZOV	08O D0	Repl. by ABAZOV 13M
$1 \pm 22 \pm 1$	AUBERT	02F BABR	Repl. by AUBERT 04P

<sup>1</sup> Uses  $A_{CP}(B^+ \rightarrow J/\psi K^+) = 0.001 \pm 0.007$  to extract production asymmetry.

<sup>2</sup> Uses  $J/\psi \rightarrow \mu^+\mu^-$  decay.

### $A_{CP}(B^+ \rightarrow J/\psi\rho^+)$

VALUE	DOCUMENT ID	TECN	COMMENT
<b><math>-0.11 \pm 0.12 \pm 0.08</math></b>	AUBERT	07AC BABR	$e^+e^- \rightarrow \gamma(4S)$

### $A_{CP}(B^+ \rightarrow J/\psi K^*(892)^+)$

VALUE	DOCUMENT ID	TECN	COMMENT
<b><math>-0.048 \pm 0.029 \pm 0.016</math></b>	<sup>1</sup> AUBERT	05J BABR	$e^+e^- \rightarrow \gamma(4S)$

<sup>1</sup> The result reported corresponds to  $-A_{CP}$ .

**$A_{CP}(B^+ \rightarrow \eta_c K^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.01 ± 0.07 OUR AVERAGE</b>	Error includes scale factor of 2.2.		
0.040 ± 0.034 ± 0.004	<sup>1</sup> AAIJ	14AF LHCB	$pp$ at 7, 8 TeV
-0.16 ± 0.08 ± 0.02	<sup>1</sup> WEI	08 BELL	$e^+e^- \rightarrow \Upsilon(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
0.046 ± 0.057 ± 0.007	<sup>1</sup> AAIJ	13AU LHCB	Repl. by AAIJ 14AF
<sup>1</sup> Uses $B^+ \rightarrow \eta_c K^+$ , where $\eta_c \rightarrow p\bar{p}$ .			

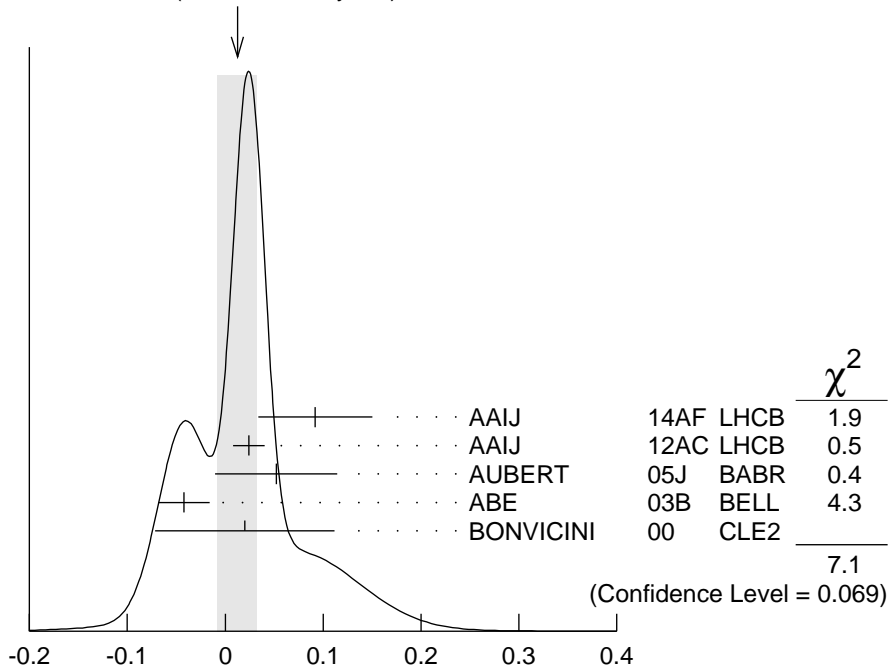
 **$A_{CP}(B^+ \rightarrow \psi(2S)\pi^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.03 ± 0.06 OUR AVERAGE</b>			
0.048 ± 0.090 ± 0.011	<sup>1</sup> AAIJ	12AC LHCB	$pp$ at 7 TeV
0.022 ± 0.085 ± 0.016	BHARDWAJ	08 BELL	$e^+e^- \rightarrow \Upsilon(4S)$
<sup>1</sup> Uses $A_{CP}(B^+ \rightarrow J/\psi K^+) = 0.001 \pm 0.007$ to extract production asymmetry.			

 **$A_{CP}(B^+ \rightarrow \psi(2S)K^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.012 ± 0.020 OUR AVERAGE</b>	Error includes scale factor of 1.5. See the ideogram below.		
0.092 ± 0.058 ± 0.004	<sup>1</sup> AAIJ	14AF LHCB	$pp$ at 7, 8 TeV
0.024 ± 0.014 ± 0.008	<sup>2</sup> AAIJ	12AC LHCB	$pp$ at 7 TeV
0.052 ± 0.059 ± 0.020	AUBERT	05J BABR	$e^+e^- \rightarrow \Upsilon(4S)$
-0.042 ± 0.020 ± 0.017	ABE	03B BELL	$e^+e^- \rightarrow \Upsilon(4S)$
0.02 ± 0.091 ± 0.01	<sup>3</sup> BONVICINI	00 CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
-0.002 ± 0.123 ± 0.012	<sup>1,2</sup> AAIJ	13AU LHCB	Repl. by AAIJ 14AF
<sup>1</sup> Uses $\psi(2S) \rightarrow p\bar{p}$ decays.			
<sup>2</sup> Uses $A_{CP}(B^+ \rightarrow J/\psi K^+) = 0.001 \pm 0.007$ to extract production asymmetry.			
<sup>3</sup> A +0.3% correction is applied due to a slightly higher reconstruction efficiency for the positive kaons.			

WEIGHTED AVERAGE  
 $0.012 \pm 0.020$  (Error scaled by 1.5)



$A_{CP}(B^+ \rightarrow \psi(2S)K^+)$

**$A_{CP}(B^+ \rightarrow \psi(2S)K^*(892)^+)$**

VALUE	DOCUMENT ID	TECN	COMMENT
$0.077 \pm 0.207 \pm 0.051$	<sup>1</sup> AUBERT	05J BABR	$e^+e^- \rightarrow \gamma(4S)$

<sup>1</sup>The result reported corresponds to  $-A_{CP}$ .

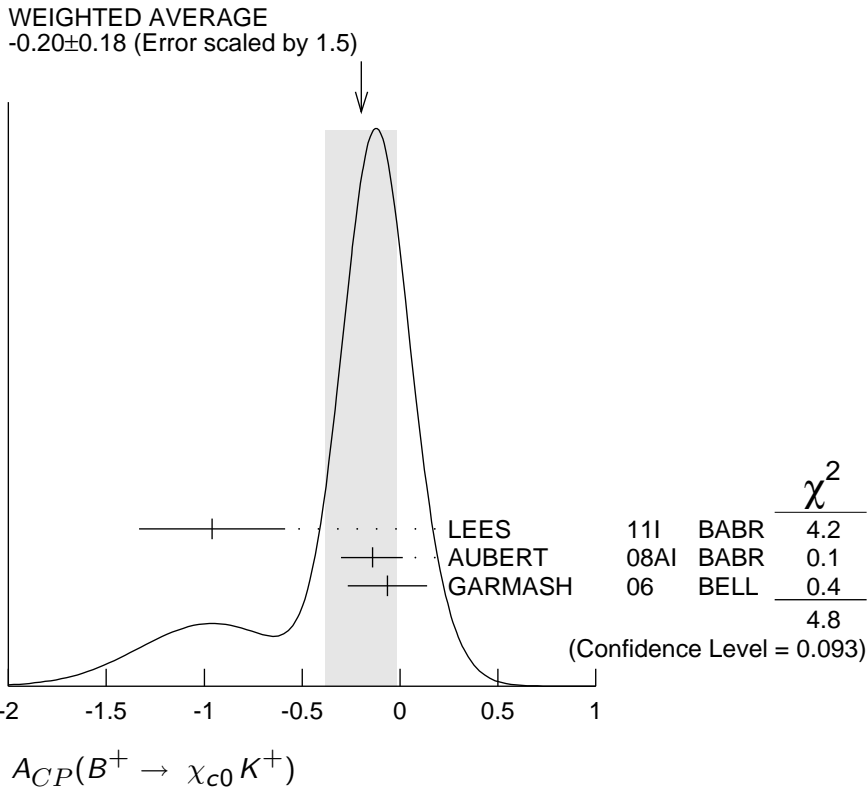
**$A_{CP}(B^+ \rightarrow \chi_{c1}(1P)\pi^+)$**

VALUE	DOCUMENT ID	TECN	COMMENT
$0.07 \pm 0.18 \pm 0.02$	KUMAR	06 BELL	$e^+e^- \rightarrow \gamma(4S)$

**$A_{CP}(B^+ \rightarrow \chi_{c0}K^+)$**

VALUE	DOCUMENT ID	TECN	COMMENT
<b><math>-0.20 \pm 0.18</math> OUR AVERAGE</b>	Error includes scale factor of 1.5. See the ideogram below.		
$-0.96 \pm 0.37 \pm 0.04$	LEES	11i BABR	$e^+e^- \rightarrow \gamma(4S)$
$-0.14 \pm 0.15^{+0.03}_{-0.06}$	AUBERT	08Ai BABR	$e^+e^- \rightarrow \gamma(4S)$
$-0.065 \pm 0.20^{+0.035}_{-0.024}$	GARMASH	06 BELL	$e^+e^- \rightarrow \gamma(4S)$





**$A_{CP}(B^+ \rightarrow \chi_{c1} K^+)$**

VALUE	DOCUMENT ID	TECN	COMMENT
<b><math>-0.009 \pm 0.033</math> OUR AVERAGE</b>			
$-0.01 \pm 0.03 \pm 0.02$	KUMAR 06	BELL	$e^+ e^- \rightarrow \gamma(4S)$
$-0.003 \pm 0.076 \pm 0.017$	<sup>1</sup> AUBERT 05J	BABR	$e^+ e^- \rightarrow \gamma(4S)$

<sup>1</sup> The result reported corresponds to  $-A_{CP}$ .

**$A_{CP}(B^+ \rightarrow \chi_{c1} K^*(892)^+)$**

VALUE	DOCUMENT ID	TECN	COMMENT
<b><math>0.471 \pm 0.378 \pm 0.268</math></b>	<sup>1</sup> AUBERT 05J	BABR	$e^+ e^- \rightarrow \gamma(4S)$

<sup>1</sup> The result reported corresponds to  $-A_{CP}$ .

**$A_{CP}(B^+ \rightarrow \bar{D}^0 \pi^+)$**

VALUE	DOCUMENT ID	TECN	COMMENT
<b><math>-0.007 \pm 0.007</math> OUR AVERAGE</b>			
$-0.006 \pm 0.005 \pm 0.010$	<sup>1</sup> AAIJ 13AE	LHCB	$pp$ at 7 TeV
$-0.008 \pm 0.008$	ABE 06	BELL	$e^+ e^- \rightarrow \gamma(4S)$

<sup>1</sup> Uses  $B^\pm \rightarrow [K^\pm \pi^\mp \pi^+ \pi^-]_D h^\pm$  mode.

**$A_{CP}(B^+ \rightarrow D_{CP(+1)} \pi^+)$**

VALUE	DOCUMENT ID	TECN	COMMENT
<b><math>0.035 \pm 0.024</math></b>	ABE 06	BELL	$e^+ e^- \rightarrow \gamma(4S)$

**$A_{CP}(B^+ \rightarrow D_{CP(-1)} \pi^+)$**

VALUE	DOCUMENT ID	TECN	COMMENT
<b><math>0.017 \pm 0.026</math></b>	ABE 06	BELL	$e^+ e^- \rightarrow \gamma(4S)$

**$A_{CP}([K^{\mp}\pi^{\pm}\pi^+\pi^-]_D\pi^+)$**

VALUE	DOCUMENT ID	TECN	COMMENT
<b><math>0.13 \pm 0.10</math></b>	AAIJ	13AE LHCb	$pp$ at 7 TeV

**$A_{CP}(B^+ \rightarrow \bar{D}^0 K^+)$**

VALUE	DOCUMENT ID	TECN	COMMENT
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**$0.007 \pm 0.025$  OUR AVERAGE** Error includes scale factor of 1.5. See the ideogram below.

$0.010 \pm 0.026 \pm 0.005$	1 AAIJ	15W LHCb	$pp$ at 7, 8 TeV
$-0.029 \pm 0.020 \pm 0.018$	2 AAIJ	13AE LHCb	$pp$ at 7 TeV
$0.066 \pm 0.036$	ABE	06 BELL	$e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

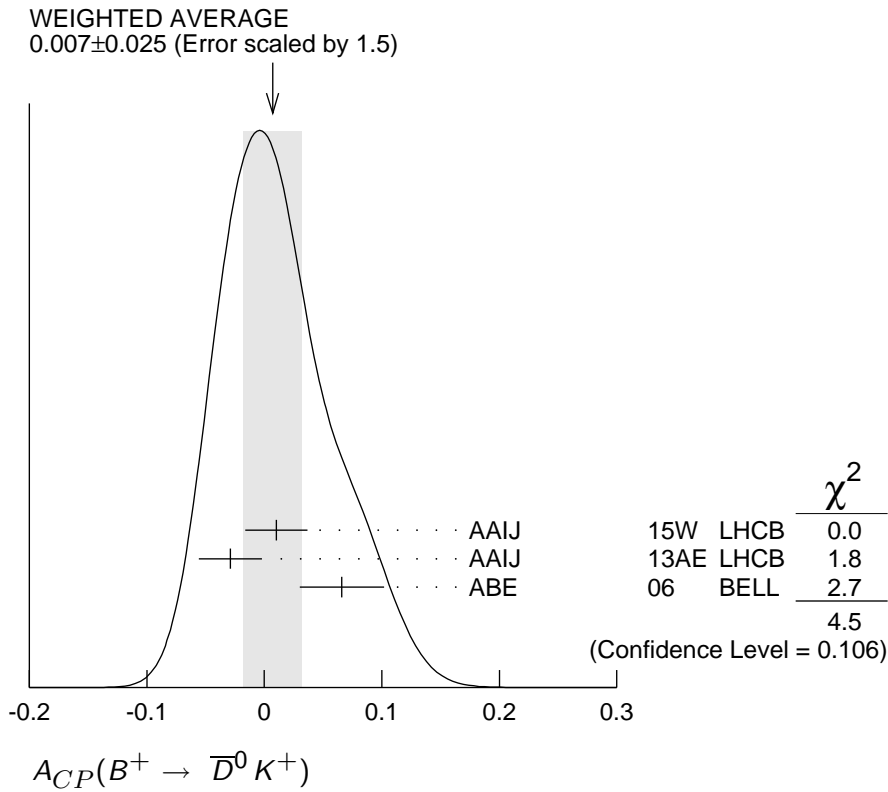
$0.003 \pm 0.080 \pm 0.037$	3 ABE	03D BELL	Repl. by SWAIN 03
$0.04 \pm 0.06 \pm 0.03$	4 SWAIN	03 BELL	Repl. by ABE 06

<sup>1</sup> Uses  $D^0 \rightarrow K^- \pi^+ \pi^0$  for the favored mode, and  $D^0 \rightarrow K^+ \pi^- \pi^0$  for the suppressed mode.

<sup>2</sup> Uses  $B^{\pm} \rightarrow [K^{\pm} \pi^{\mp} \pi^+ \pi^-]_D h^{\pm}$  mode.

<sup>3</sup> Corresponds to 90% confidence range  $-0.15 < A_{CP} < 0.16$ .

<sup>4</sup> Corresponds to 90% confidence range  $-0.07 < A_{CP} < 0.15$ .



**$A_{CP}([K^{\mp}\pi^{\pm}\pi^+\pi^-]_D K^+)$**

VALUE	DOCUMENT ID	TECN	COMMENT
<b><math>-0.42 \pm 0.22</math></b>	AAIJ	13AE LHCb	$pp$ at 7 TeV

### $r_B(B^+ \rightarrow D^0 K^+)$

$r_B$  and  $\delta_B$  are the amplitude ratio and relative strong phase between the amplitudes of  $A(B^+ \rightarrow D^0 K^+)$  and  $A(B^+ \rightarrow \bar{D}^0 K^+)$ ,

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b>0.095 ± 0.008 OUR AVERAGE</b>				
$0.080^{+0.019}_{-0.021}$		1 AAIJ	14BA LHCb	$pp$ at 7, 8 TeV
$0.097 \pm 0.011$		2 AAIJ	13AE LHCb	$pp$ at 7 TeV
$0.092^{+0.013}_{-0.012}$		3 LEES	13B BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$0.160^{+0.040+0.051}_{-0.038-0.015}$		4 POLUEKTOV 10	BELL	$e^+e^- \rightarrow \Upsilon(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
$0.06 \pm 0.04$		5 AAIJ	14BE LHCb	Repl. by AAIJ 14BA
$0.07 \pm 0.04$		6,7 AAIJ	12AQ LHCb	$pp$ at 7 TeV
$0.145 \pm 0.030 \pm 0.015$		7,8 AIHARA	12 BELL	$e^+e^- \rightarrow \Upsilon(4S)$
$< 0.13$	90	9 LEES	11D BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$0.096 \pm 0.029 \pm 0.006$		10 DEL-AMO-SA..10F	BABR	Repl. by LEES 13B
$0.095^{+0.051}_{-0.041}$		11 DEL-AMO-SA..10H	BABR	Repl. by LEES 13B
$0.086 \pm 0.032 \pm 0.015$		12 AUBERT	08AL BABR	Repl. by DEL-AMO-SANCHEZ 10F
$< 0.19$	90	HORII	08 BELL	$e^+e^- \rightarrow \Upsilon(4S)$
$0.159^{+0.054}_{-0.050} \pm 0.050$		13 POLUEKTOV 06	BELL	Repl. by POLUEKTOV 10
$0.12 \pm 0.08 \pm 0.05$		14 AUBERT,B	05Y BABR	Repl. by AUBERT 08AL

<sup>1</sup> Uses binned Dalitz plot analysis of  $B^+ \rightarrow DK^+$  decays, with  $D \rightarrow K_S^0 \pi^+ \pi^-$  and  $D \rightarrow K_S^0 K^+ K^-$ . Strong phase measurements from CLEO-c (LIBBY 10) of the  $D$  decay over the Dalitz plot are used as input.

<sup>2</sup> Uses  $B^\pm \rightarrow [K^\pm \pi^\mp \pi^+ \pi^-]_D h^\pm$  mode.

<sup>3</sup> Reports combination of published measurements using GGSZ, GLW, and ADS methods.

<sup>4</sup> Uses Dalitz plot analysis of  $\bar{D}^0 \rightarrow K_S^0 \pi^+ \pi^-$  decays from  $B^+ \rightarrow D^0 K^+$  modes. The corresponding two standard deviation interval is  $0.084 < r_B < 0.239$ .

<sup>5</sup> AAIJ 14BE uses model-dependent analysis of  $D \rightarrow K_S^0 \pi^+ \pi^-$  amplitudes. The model is the same as in DEL-AMO-SANCHEZ 10F.

<sup>6</sup> Reports combined statistical and systematic uncertainties.

<sup>7</sup> Uses binned Dalitz plot of  $\bar{D}^0 \rightarrow K_S^0 \pi^+ \pi^-$  decays from  $B^+ \rightarrow \bar{D}^0 K^+$ . Measurement of strong phases in  $\bar{D}^0 \rightarrow K_S^0 \pi^+ \pi^-$  Dalitz plot from LIBBY 10 is used as input.

<sup>8</sup> We combined the systematics in quadrature. The authors report separately the contribution to the systematic uncertainty due to the uncertainty on the bin-averaged strong phase difference between  $D^0$  and  $\bar{D}^0$  amplitudes.

<sup>9</sup> Uses decays of neutral  $D$  to  $K^- \pi^+ \pi^0$ .

<sup>10</sup> Uses Dalitz plot analysis of  $\bar{D}^0 \rightarrow K_S^0 \pi^+ \pi^-$ ,  $K_S^0 K^+ K^-$  decays from  $B^+ \rightarrow D(*) K(*)^+$  modes. The corresponding two standard deviation interval is  $0.037 < r_B < 0.155$ .

<sup>11</sup> Uses the Cabibbo suppressed decay of  $B^+ \rightarrow \bar{D} K^+$  followed by  $\bar{D} \rightarrow K^- \pi^+$ .

<sup>12</sup> Uses Dalitz plot analysis of  $\bar{D}^0 \rightarrow K_S^0 \pi^+ \pi^-$  and  $\bar{D}^0 \rightarrow K_S^0 K^+ K^-$  decays coming from  $B^\pm \rightarrow D(*) K(*)^\pm$  modes.

<sup>13</sup> Uses a Dalitz plot analysis of the  $\bar{D}^0 \rightarrow K_S^0 \pi^+ \pi^-$  decays; Combines the  $DK^+$ ,  $D^* K^+$  and  $DK^{*+}$  modes.

<sup>14</sup> Uses a Dalitz analysis of neutral  $D$  decays to  $K_S^0 \pi^+ \pi^-$  in the processes  $B^\pm \rightarrow D(*) K^\pm$ ,  $D^* \rightarrow D \pi^0$ ,  $D \gamma$ .

$\delta_B(B^+ \rightarrow D^0 K^+)$ 

VALUE (°)	DOCUMENT ID	TECN	COMMENT
<b>123 ±10</b>	<b>OUR AVERAGE</b>		
134 $\begin{smallmatrix} +14 \\ -15 \end{smallmatrix}$	<sup>1</sup> AAIJ	14BA LHCb	$pp$ at 7, 8 TeV
105 $\begin{smallmatrix} +16 \\ -17 \end{smallmatrix}$	<sup>2</sup> LEES	13B BABR	$e^+e^- \rightarrow \Upsilon(4S)$
136.7 $\begin{smallmatrix} +13.0 \\ -15.8 \end{smallmatrix} \pm 23.2$	<sup>3</sup> POLUEKTOV	10 BELL	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
115 $\begin{smallmatrix} +41 \\ -51 \end{smallmatrix}$	<sup>4</sup> AAIJ	14BE LHCb	Repl. by AAIJ 14BA
137 $\begin{smallmatrix} +35 \\ -46 \end{smallmatrix}$	<sup>5,6</sup> AAIJ	12AQ LHCb	$pp$ at 7 TeV
129.9 $\pm 15.0 \pm 6.0$	<sup>6,7</sup> AIHARA	12 BELL	$e^+e^- \rightarrow \Upsilon(4S)$
119 $\begin{smallmatrix} +19 \\ -20 \end{smallmatrix} \pm 4$	<sup>8</sup> DEL-AMO-SA..10F	BABR	Repl. by LEES 13B
109 $\begin{smallmatrix} +27 \\ -30 \end{smallmatrix} \pm 8$	<sup>9</sup> AUBERT	08AL BABR	Repl. by DEL-AMO-SANCHEZ 10F
145.7 $\begin{smallmatrix} +19.0 \\ -19.7 \end{smallmatrix} \pm 23.1$	<sup>10</sup> POLUEKTOV	06 BELL	Repl. by POLUEKTOV 10
104 $\pm 45 \begin{smallmatrix} +23 \\ -32 \end{smallmatrix}$	<sup>11</sup> AUBERT,B	05Y BABR	Repl. by AUBERT 08AL

<sup>1</sup> Uses binned Dalitz plot analysis of  $B^+ \rightarrow DK^+$  decays, with  $D \rightarrow K_S^0 \pi^+ \pi^-$  and  $D \rightarrow K_S^0 K^+ K^-$ . Strong phase measurements from CLEO-c (LIBBY 10) of the  $D$  decay over the Dalitz plot are used as input.

<sup>2</sup> Reports combination of published measurements using GGSZ, GLW, and ADS methods.

<sup>3</sup> Uses Dalitz plot analysis of  $\bar{D}^0 \rightarrow K_S^0 \pi^+ \pi^-$  decays from  $B^+ \rightarrow \bar{D}^0 K^+$  modes. The corresponding two standard deviation interval is  $102.2^\circ < \delta_B < 162.3^\circ$ .

<sup>4</sup> AAIJ 14BE uses model-dependent analysis of  $D \rightarrow K_S^0 \pi^+ \pi^-$  amplitudes. The model is the same as in DEL-AMO-SANCHEZ 10F.

<sup>5</sup> Reports combined statistical and systematic uncertainties.

<sup>6</sup> Uses binned Dalitz plot of  $\bar{D}^0 \rightarrow K_S^0 \pi^+ \pi^-$  decays from  $B^+ \rightarrow \bar{D}^0 K^+$ . Measurement of strong phases in  $\bar{D}^0 \rightarrow K_S^0 \pi^+ \pi^-$  Dalitz plot from LIBBY 10 is used as input.

<sup>7</sup> We combined the systematics in quadrature. The authors report separately the contribution to the systematic uncertainty due to the uncertainty on the bin-averaged strong phase difference between  $D^0$  and  $\bar{D}^0$  amplitudes.

<sup>8</sup> Uses Dalitz plot analysis of  $\bar{D}^0 \rightarrow K_S^0 \pi^+ \pi^-$ ,  $K_S^0 K^+ K^-$  decays from  $B^+ \rightarrow D^{(*)} K^{(*)+}$  modes. The corresponding two standard deviation interval is  $75^\circ < \delta_B < 157^\circ$ .

<sup>9</sup> Uses Dalitz plot analysis of  $\bar{D}^0 \rightarrow K_S^0 \pi^+ \pi^-$  and  $\bar{D}^0 \rightarrow K_S^0 K^+ K^-$  decays coming from  $B^\pm \rightarrow D^{(*)} K^{(*)\pm}$  modes.

<sup>10</sup> Uses a Dalitz plot analysis of the  $\bar{D}^0 \rightarrow K_S^0 \pi^+ \pi^-$  decays; Combines the  $DK^+$ ,  $D^* K^+$  and  $DK^{*+}$  modes.

<sup>11</sup> Uses a Dalitz analysis of neutral  $D$  decays to  $K_S^0 \pi^+ \pi^-$  in the processes  $B^\pm \rightarrow D^{(*)} K^\pm$ ,  $D^* \rightarrow D\pi^0, D\gamma$ .

### $r_B(B^+ \rightarrow \bar{D}^0 K^{*+})$

$r_B$  and  $\delta_B$  are the amplitude ratio and relative strong phase between the amplitudes of  $A_{CP}(B^+ \rightarrow D^0 K^{*+})$  and  $A_{CP}(B^+ \rightarrow \bar{D}^0 K^{*+})$ ,

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.17 ± 0.11 OUR AVERAGE</b>	Error includes scale factor of 2.3.		
0.143 <sup>+0.048</sup> <sub>-0.049</sub>	<sup>1</sup> LEES	13B BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
0.564 <sup>+0.216</sup> <sub>-0.155</sub> ± 0.093	<sup>2</sup> POLUEKTOV 06	BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.166 <sup>+0.073</sup> <sub>-0.069</sub>	<sup>3</sup> DEL-AMO-SA..10F	BABR	Repl. by LEES 13B
0.31 ± 0.07	<sup>4</sup> AUBERT	09AJ BABR	Repl. by LEES 13B
0.181 <sup>+0.088</sup> <sub>-0.108</sub> ± 0.042	<sup>5</sup> AUBERT	08AL BABR	Repl. by AUBERT 09AJ

<sup>1</sup> Reports combination of published measurements using GGSZ, GLW, and ADS methods.

<sup>2</sup> Uses a Dalitz plot analysis of the  $\bar{D}^0 \rightarrow K_S^0 \pi^+ \pi^-$  decays; Combines the  $DK^+$ ,  $D^* K^+$  and  $DK^{*+}$  modes.

<sup>3</sup> DEL-AMO-SANCHEZ 10F reports  $r_B \cdot k = 0.149^{+0.066}_{-0.062}$  for  $k = 0.9$ .

<sup>4</sup> Obtained by combining the GLW and ADS methods. The 2-sigma range corresponds to [0.17, 0.43].

<sup>5</sup> Uses Dalitz plot analysis of  $\bar{D}^0 \rightarrow K_S^0 \pi^+ \pi^-$  and  $\bar{D}^0 \rightarrow K_S^0 K^+ K^-$  decays coming from  $B^\pm \rightarrow D^{(*)} K^{(*)\pm}$  modes.

### $\delta_B(B^+ \rightarrow D^0 K^{*+})$

VALUE (°)	DOCUMENT ID	TECN	COMMENT
<b>155 ± 70 OUR AVERAGE</b>	Error includes scale factor of 2.0.		
101 ± 43	<sup>1</sup> LEES	13B BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
242.6 <sup>+20.2</sup> <sub>-23.2</sub> ± 49.4	<sup>2</sup> POLUEKTOV 06	BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
111 ± 32	DEL-AMO-SA..10F	BABR	Repl. by LEES 13B
104 <sup>+39</sup> <sub>-37</sub> ± 18	<sup>3</sup> AUBERT	08AL BABR	Repl. by LEES 13B

<sup>1</sup> Reports combination of published measurements using GGSZ, GLW, and ADS methods.

<sup>2</sup> Uses a Dalitz plot analysis of the  $\bar{D}^0 \rightarrow K_S^0 \pi^+ \pi^-$  decays; Combines the  $DK^+$ ,  $D^* K^+$  and  $DK^{*+}$  modes.

<sup>3</sup> Uses Dalitz plot analysis of  $\bar{D}^0 \rightarrow K_S^0 \pi^+ \pi^-$  and  $\bar{D}^0 \rightarrow K_S^0 K^+ K^-$  decays coming from  $B^\pm \rightarrow D^{(*)} K^{(*)\pm}$  modes.

### $A_{CP}(B^+ \rightarrow [K^- \pi^+]_D K^+)$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>-0.58 ± 0.21 OUR AVERAGE</b>			
-0.82 ± 0.44 ± 0.09	AALTONEN	11AJ CDF	$p\bar{p}$ at 1.96 TeV
-0.39 <sup>+0.26</sup> <sub>-0.28</sub> ± 0.04	HORII	11 BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
-0.86 ± 0.47 <sup>+0.12</sup> <sub>-0.16</sub>	DEL-AMO-SA..10H	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
-0.1 <sup>+0.8</sup> <sub>-1.0</sub> ± 0.4	HORII	08 BELL	Repl. by HORII 11
+0.88 <sup>+0.77</sup> <sub>-0.62</sub> ± 0.06	SAIGO	05 BELL	Repl. by HORII 08

**$A_{CP}(B^+ \rightarrow [K^- \pi^+ \pi^0]_D K^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>0.07 \pm 0.30</math> OUR AVERAGE</b>	Error includes scale factor of 1.5.		
$-0.20 \pm 0.27 \pm 0.04$	<sup>1</sup> AAIJ	15W	LHCB $pp$ at 7, 8 TeV
$0.41 \pm 0.30 \pm 0.05$	NAYAK	13	BELL $e^+ e^- \rightarrow \Upsilon(4S)$
<sup>1</sup> Uses $D^0 \rightarrow K^- \pi^+ \pi^0$ for the favored mode, and $D^0 \rightarrow K^+ \pi^- \pi^0$ for the suppressed mode.			

 **$A_{CP}(B^+ \rightarrow [K^+ K^- \pi^0]_D K^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>0.30 \pm 0.20 \pm 0.02</math></b>	<sup>1</sup> AAIJ	15W	LHCB $pp$ at 7, 8 TeV
<sup>1</sup> Uses $D \rightarrow K^+ K^- \pi^0$ mode.			

 **$A_{CP}(B^+ \rightarrow [\pi^+ \pi^- \pi^0]_D K^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>0.054 \pm 0.091 \pm 0.011</math></b>	<sup>1</sup> AAIJ	15W	LHCB $pp$ at 7, 8 TeV
<sup>1</sup> Uses $D \rightarrow \pi^+ \pi^- \pi^0$ mode.			

 **$A_{CP}(B^+ \rightarrow [K^- \pi^+]_{\bar{D}} K^*(892)^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>-0.34 \pm 0.43 \pm 0.16</math></b>	AUBERT	09AJ	BABR $e^+ e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
$-0.22 \pm 0.61 \pm 0.17$	AUBERT,B	05V	BABR Repl. by AUBERT 09AJ

 **$A_{CP}(B^+ \rightarrow [K^- \pi^+]_D \pi^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>0.00 \pm 0.09</math> OUR AVERAGE</b>			
$0.13 \pm 0.25 \pm 0.02$	AALTONEN	11AJ	CDF $p\bar{p}$ at 1.96 TeV
$-0.04 \pm 0.11^{+0.02}_{-0.01}$	HORII	11	BELL $e^+ e^- \rightarrow \Upsilon(4S)$
$0.03 \pm 0.17 \pm 0.04$	DEL-AMO-SA...	10H	BABR $e^+ e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
$-0.02^{+0.15}_{-0.16} \pm 0.04$	HORII	08	BELL Repl. by HORII 11
$+0.30^{+0.29}_{-0.25} \pm 0.06$	SAIGO	05	BELL Repl. by HORII 08

 **$A_{CP}(B^+ \rightarrow [K^- \pi^+ \pi^0]_D \pi^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>0.35 \pm 0.16</math> OUR AVERAGE</b>			
$0.438 \pm 0.190 \pm 0.011$	<sup>1</sup> AAIJ	15W	LHCB $pp$ at 7, 8 TeV
$0.16 \pm 0.27^{+0.03}_{-0.04}$	NAYAK	13	BELL $e^+ e^- \rightarrow \Upsilon(4S)$
<sup>1</sup> Uses $D^0 \rightarrow K^- \pi^+ \pi^0$ for the favored mode, and $D^0 \rightarrow K^+ \pi^- \pi^0$ for the suppressed mode.			

 **$A_{CP}(B^+ \rightarrow [K^+ K^- \pi^0]_D \pi^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>-0.030 \pm 0.040 \pm 0.005</math></b>	<sup>1</sup> AAIJ	15W	LHCB $pp$ at 7, 8 TeV
<sup>1</sup> Uses $D \rightarrow K^+ K^-$ mode.			

**$A_{CP}(B^+ \rightarrow [\pi^+ \pi^- \pi^0]_D \pi^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$-0.016 \pm 0.020 \pm 0.004$	<sup>1</sup> AAIJ	15W LHCB	$pp$ at 7, 8 TeV

<sup>1</sup> Uses  $D \rightarrow \pi^+ \pi^-$  mode. **$A_{CP}(B^+ \rightarrow [K^- \pi^+]_{(D\pi)} \pi^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$-0.09 \pm 0.27 \pm 0.05$	DEL-AMO-SA..10H	BABR	$e^+ e^- \rightarrow \gamma(4S)$

 **$A_{CP}(B^+ \rightarrow [K^- \pi^+]_{(D\gamma)} \pi^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$-0.65 \pm 0.55 \pm 0.22$	DEL-AMO-SA..10H	BABR	$e^+ e^- \rightarrow \gamma(4S)$

 **$A_{CP}(B^+ \rightarrow [K^- \pi^+]_{(D\pi)} K^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$0.77 \pm 0.35 \pm 0.12$	DEL-AMO-SA..10H	BABR	$e^+ e^- \rightarrow \gamma(4S)$

 **$A_{CP}(B^+ \rightarrow [K^- \pi^+]_{(D\gamma)} K^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$0.36 \pm 0.94^{+0.25}_{-0.41}$	DEL-AMO-SA..10H	BABR	$e^+ e^- \rightarrow \gamma(4S)$

 **$A_{CP}(B^+ \rightarrow [\pi^+ \pi^- \pi^0]_D K^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$-0.02 \pm 0.15 \pm 0.03$	<sup>1</sup> AUBERT	07BJ BABR	$e^+ e^- \rightarrow \gamma(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

 $-0.02 \pm 0.16 \pm 0.03$  AUBERT,B 05T BABR Repl. by AUBERT 07BJ<sup>1</sup> Uses a Dalitz plot analysis of  $D^0 \rightarrow \pi^+ \pi^- \pi^0$ . Also reports the one-sigma regions:  $0.06 < r_B < 0.78$ ,  $-30^\circ < \gamma < 76^\circ$ , and  $-27^\circ < \delta < 78^\circ$ . **$A_{CP}(B^+ \rightarrow [K_S^0 K^+ \pi^-]_D K^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$0.040 \pm 0.091 \pm 0.018$	<sup>1</sup> AAIJ	14V LHCB	$pp$ at 7, 8 TeV

<sup>1</sup> The analysis uses all of  $D \rightarrow K_S^0 K \pi$  Dalitz decays. **$A_{CP}(B^+ \rightarrow [K_S^0 K^- \pi^+]_D K^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$0.233 \pm 0.129 \pm 0.024$	<sup>1</sup> AAIJ	14V LHCB	$pp$ at 7, 8 TeV

<sup>1</sup> The analysis uses all of  $D \rightarrow K_S^0 K \pi$  Dalitz decays. **$A_{CP}(B^+ \rightarrow [K_S^0 K^- \pi^+]_D \pi^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$-0.052 \pm 0.029 \pm 0.017$	<sup>1</sup> AAIJ	14V LHCB	$pp$ at 7, 8 TeV

<sup>1</sup> The analysis uses all of  $D \rightarrow K_S^0 K \pi$  Dalitz decays.

**$A_{CP}(B^+ \rightarrow [K_S^0 K^+ \pi^-]_D \pi^+)$**

VALUE	DOCUMENT ID	TECN	COMMENT
$-0.025 \pm 0.024 \pm 0.010$	<sup>1</sup> AAIJ	14V LHCb	$pp$ at 7, 8 TeV

<sup>1</sup> The analysis uses all of  $D \rightarrow K_S^0 K \pi$  Dalitz decays.

**$A_{CP}(B^+ \rightarrow [K^*(892)^- K^+]_D K^+)$**

VALUE	DOCUMENT ID	TECN	COMMENT
$0.026 \pm 0.109 \pm 0.029$	<sup>1</sup> AAIJ	14V LHCb	$pp$ at 7, 8 TeV

<sup>1</sup> The Analysis uses  $D \rightarrow K^*(892) K \rightarrow K_S^0 K \pi$  decays.

**$A_{CP}(B^+ \rightarrow [K^*(892)^+ K^-]_D K^+)$**

VALUE	DOCUMENT ID	TECN	COMMENT
$0.336 \pm 0.208 \pm 0.026$	<sup>1</sup> AAIJ	14V LHCb	$pp$ at 7, 8 TeV

<sup>1</sup> The Analysis uses  $D \rightarrow K^*(892) K \rightarrow K_S^0 K \pi$  decays.

**$A_{CP}(B^+ \rightarrow [K^*(892)^+ K^-]_D \pi^+)$**

VALUE	DOCUMENT ID	TECN	COMMENT
$-0.054 \pm 0.043 \pm 0.017$	<sup>1</sup> AAIJ	14V LHCb	$pp$ at 7, 8 TeV

<sup>1</sup> The Analysis uses  $D \rightarrow K^*(892) K \rightarrow K_S^0 K \pi$  decays.

**$A_{CP}(B^+ \rightarrow [K^*(892)^- K^+]_D \pi^+)$**

VALUE	DOCUMENT ID	TECN	COMMENT
$-0.012 \pm 0.028 \pm 0.010$	<sup>1</sup> AAIJ	14V LHCb	$pp$ at 7, 8 TeV

<sup>1</sup> The Analysis uses  $D \rightarrow K^*(892) K \rightarrow K_S^0 K \pi$  decays.

**$A_{CP}(B^+ \rightarrow D_{CP(+1)} K^+)$**

VALUE	DOCUMENT ID	TECN	COMMENT
<b><math>0.170 \pm 0.033</math> OUR AVERAGE</b>	Error includes scale factor of 1.2.		

$0.145 \pm 0.032 \pm 0.010$	<sup>1</sup> AAIJ	12M LHCb	$pp$ at 7 TeV
$0.39 \pm 0.17 \pm 0.04$	AALTONEN	10A CDF	$p\bar{p}$ at 1.96 TeV
$0.25 \pm 0.06 \pm 0.02$	<sup>2</sup> DEL-AMO-SA..10G	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
$0.06 \pm 0.14 \pm 0.05$	ABE	06 BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
$0.27 \pm 0.09 \pm 0.04$	AUBERT	08AA BABR	Repl. by DEL-AMO-SANCHEZ 10G
$0.35 \pm 0.13 \pm 0.04$	AUBERT	06J BABR	Repl. by AUBERT 08AA
$0.07 \pm 0.17 \pm 0.06$	AUBERT	04N BABR	Repl. by AUBERT 06J
$0.29 \pm 0.26 \pm 0.05$	<sup>3</sup> ABE	03D BELL	Repl. by SWAIN 03
$0.06 \pm 0.19 \pm 0.04$	<sup>4</sup> SWAIN	03 BELL	Repl. by ABE 06

<sup>1</sup> AAIJ 12M reports an evidence of direct  $CP$  violation in  $B^\pm \rightarrow DK^\pm$  decays with a total significance of  $5.8 \sigma$ .

<sup>2</sup> Reports the first evidence for direct  $CP$  violation in  $B \rightarrow DK$  decays with 3.6 standard deviations.

<sup>3</sup> Corresponds to 90% confidence range  $-0.14 < A_{CP} < 0.73$ .

<sup>4</sup> Corresponds to 90% confidence range  $-0.26 < A_{CP} < 0.38$ .



### $A_{ADS}(B^+ \rightarrow DK^+)$

$$A_{ADS}(B^+ \rightarrow DK^+) = \frac{(R_K^- - R_K^+)}{(R_K^- + R_K^+)} \text{ where}$$

$$R_K^- = \Gamma(B^- \rightarrow [K^+ \pi^-]_D K^-) / \Gamma(B^- \rightarrow [K^- \pi^+]_D K^-) \text{ and}$$

$$R_K^+ = \Gamma(B^+ \rightarrow [K^- \pi^+]_D K^+) / \Gamma(B^+ \rightarrow [K^+ \pi^-]_D K^+)$$

VALUE	DOCUMENT ID	TECN	COMMENT
<b><math>-0.52 \pm 0.15 \pm 0.02</math></b>	AAIJ	12M LHCB	$pp$ at 7 TeV

### $A_{ADS}(B^+ \rightarrow D\pi^+)$

$$A_{ADS}(B^+ \rightarrow D\pi^+) = \frac{(R_\pi^- - R_\pi^+)}{(R_\pi^- + R_\pi^+)} \text{ where}$$

$$R_\pi^- = \Gamma(B^- \rightarrow [K^+ \pi^-]_D \pi^-) / \Gamma(B^- \rightarrow [K^- \pi^+]_D \pi^-) \text{ and}$$

$$R_\pi^+ = \Gamma(B^+ \rightarrow [K^- \pi^+]_D \pi^+) / \Gamma(B^+ \rightarrow [K^+ \pi^-]_D \pi^+)$$

VALUE	DOCUMENT ID	TECN	COMMENT
<b><math>0.143 \pm 0.062 \pm 0.011</math></b>	AAIJ	12M LHCB	$pp$ at 7 TeV

### $A_{ADS}(B^+ \rightarrow [K^- \pi^+]_D K^+ \pi^- \pi^+)$

VALUE	DOCUMENT ID	TECN	COMMENT
<b><math>-0.33^{+0.36}_{-0.34}</math></b>	AAIJ	15BC LHCB	$pp$ at 7, 8 TeV

### $A_{ADS}(B^+ \rightarrow [K^- \pi^+]_D \pi^+ \pi^- \pi^+)$

VALUE	DOCUMENT ID	TECN	COMMENT
<b><math>-0.013 \pm 0.087</math></b>	AAIJ	15BC LHCB	$pp$ at 7, 8 TeV

### $A_{CP}(B^+ \rightarrow D_{CP(-1)} K^+)$

VALUE	DOCUMENT ID	TECN	COMMENT
<b><math>-0.10 \pm 0.07</math> OUR AVERAGE</b>			

$-0.09 \pm 0.07 \pm 0.02$  DEL-AMO-SA..10G BABR  $e^+ e^- \rightarrow \Upsilon(4S)$

$-0.12 \pm 0.14 \pm 0.05$  ABE 06 BELL  $e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$-0.09 \pm 0.09 \pm 0.02$  AUBERT 08AA BABR Repl. by DEL-AMO-SANCHEZ 10G

$-0.06 \pm 0.13 \pm 0.04$  AUBERT 06J BABR Repl. by AUBERT 08AA

$-0.22 \pm 0.24 \pm 0.04$  <sup>1</sup> ABE 03D BELL Repl. by SWAIN 03

$-0.19 \pm 0.17 \pm 0.05$  <sup>2</sup> SWAIN 03 BELL Repl. by ABE 06

<sup>1</sup> Corresponds to 90% confidence range  $-0.62 < A_{CP} < 0.18$ .

<sup>2</sup> Corresponds to 90% confidence range  $-0.47 < A_{CP} < 0.11$ .

### $A_{CP}(B^+ \rightarrow [K^+ K^-]_D K^+ \pi^- \pi^+)$

VALUE	DOCUMENT ID	TECN	COMMENT
<b><math>-0.045 \pm 0.064 \pm 0.011</math></b>	AAIJ	15BC LHCB	$pp$ at 7, 8 TeV

### $A_{CP}(B^+ \rightarrow [\pi^+ \pi^-]_D K^+ \pi^- \pi^+)$

VALUE	DOCUMENT ID	TECN	COMMENT
<b><math>-0.054 \pm 0.101 \pm 0.011</math></b>	AAIJ	15BC LHCB	$pp$ at 7, 8 TeV

**$A_{CP}(B^+ \rightarrow [K^- \pi^+]_D K^+ \pi^- \pi^+)$**

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>0.013 \pm 0.019 \pm 0.013</math></b>	AAIJ	15BC LHCB	$pp$ at 7, 8 TeV

**$A_{CP}(B^+ \rightarrow [K^+ K^-]_D \pi^+ \pi^- \pi^+)$**

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>-0.019 \pm 0.011 \pm 0.010</math></b>	AAIJ	15BC LHCB	$pp$ at 7, 8 TeV

**$A_{CP}(B^+ \rightarrow [\pi^+ \pi^-]_D \pi^+ \pi^- \pi^+)$**

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>-0.013 \pm 0.016 \pm 0.010</math></b>	AAIJ	15BC LHCB	$pp$ at 7, 8 TeV

**$A_{CP}(B^+ \rightarrow [K^- \pi^+]_D \pi^+ \pi^- \pi^+)$**

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>-0.002 \pm 0.003 \pm 0.011</math></b>	AAIJ	15BC LHCB	$pp$ at 7, 8 TeV

**$A_{CP}(B^+ \rightarrow \bar{D}^{*0} \pi^+)$**

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>-0.014 \pm 0.015</math></b>	ABE	06 BELL	$e^+ e^- \rightarrow \gamma(4S)$

**$A_{CP}(B^+ \rightarrow (D_{CP(+1)}^*)^0 \pi^+)$**

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>-0.021 \pm 0.045</math></b>	ABE	06 BELL	$e^+ e^- \rightarrow \gamma(4S)$

**$A_{CP}(B^+ \rightarrow (D_{CP(-1)}^*)^0 \pi^+)$**

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>-0.090 \pm 0.051</math></b>	ABE	06 BELL	$e^+ e^- \rightarrow \gamma(4S)$

**$A_{CP}(B^+ \rightarrow D^{*0} K^+)$**

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>-0.07 \pm 0.04</math> OUR AVERAGE</b>			
$-0.06 \pm 0.04 \pm 0.01$	AUBERT	08BF BABR	$e^+ e^- \rightarrow \gamma(4S)$
$-0.089 \pm 0.086$	ABE	06 BELL	$e^+ e^- \rightarrow \gamma(4S)$

**$r_B^*(B^+ \rightarrow D^{*0} K^+)$**

$r_B^*$  and  $\delta_B^*$  are the amplitude ratio and relative strong phase between the amplitudes of  $A(B^+ \rightarrow D^{*0} K^+)$  and  $A(B^+ \rightarrow \bar{D}^{*0} K^+)$ ,

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>0.114^{+0.023}_{-0.040}</math> OUR AVERAGE</b>			Error includes scale factor of 1.2.
$0.106^{+0.019}_{-0.036}$	1 LEES	13B BABR	$e^+ e^- \rightarrow \gamma(4S)$
$0.196^{+0.072+0.064}_{-0.069-0.017}$	2 POLUEKTOV	10 BELL	$e^+ e^- \rightarrow \gamma(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$0.133^{+0.042}_{-0.039} \pm 0.013$	<sup>3</sup> DEL-AMO-SA..10F	BABR	Repl. by LEES 13B
$0.096^{+0.035}_{-0.051}$	<sup>4</sup> DEL-AMO-SA..10H	BABR	Repl. by LEES 13B
$0.135 \pm 0.050 \pm 0.012$	<sup>5</sup> AUBERT	08AL BABR	Repl. by DEL-AMO-SANCHEZ 10F
$0.175^{+0.108}_{-0.099} \pm 0.050$	<sup>6</sup> POLUEKTOV 06	BELL	Repl. by POLUEKTOV 10
$0.17 \pm 0.10 \pm 0.04$	<sup>7</sup> AUBERT,B	05Y BABR	Repl. by AUBERT 08AL

<sup>1</sup> Reports combination of published measurements using GGSZ, GLW, and ADS methods.

<sup>2</sup> Uses Dalitz plot analysis of  $\bar{D}^0 \rightarrow K_S^0 \pi^+ \pi^-$  decays from  $B^+ \rightarrow D^{*0} K^+$  modes.

The corresponding two standard deviation interval is  $0.061 < r_B^* < 0.271$ .

<sup>3</sup> Uses Dalitz plot analysis of  $\bar{D}^0 \rightarrow K_S^0 \pi^+ \pi^-$ ,  $K_S^0 K^+ K^-$  decays from  $B^+ \rightarrow D^{(*)} K^{(*)+}$  modes. The corresponding two standard deviation interval is  $0.049 < r_B^* < 0.215$ .

<sup>4</sup> Uses the Cabibbo suppressed decay of  $B^+ \rightarrow \bar{D}^* K^+$  followed by  $\bar{D}^* \rightarrow \bar{D} \pi^0$  or  $\bar{D} \gamma$ , and  $\bar{D} \rightarrow K^- \pi^+$ .

<sup>5</sup> Uses Dalitz plot analysis of  $\bar{D}^0 \rightarrow K_S^0 \pi^+ \pi^-$  and  $\bar{D}^0 \rightarrow K_S^0 K^+ K^-$  decays coming from  $B^\pm \rightarrow D^{(*)} K^{(*)\pm}$  modes.

<sup>6</sup> Uses a Dalitz plot analysis of the  $\bar{D}^0 \rightarrow K_S^0 \pi^+ \pi^-$  decays; Combines the  $DK^+$ ,  $D^* K^+$  and  $DK^{*+}$  modes.

<sup>7</sup> Uses a Dalitz analysis of neutral  $D$  decays to  $K_S^0 \pi^+ \pi^-$  in the processes  $B^\pm \rightarrow D^{(*)} K^\pm$ ,  $D^* \rightarrow D \pi^0$ ,  $D \gamma$ .

### $\delta_B^*(B^+ \rightarrow D^{*0} K^+)$

VALUE (°)	DOCUMENT ID	TECN	COMMENT
<b>310</b> $^{+22}_{-28}$	<b>OUR AVERAGE</b>		Error includes scale factor of 1.3.

294	$^{+21}_{-31}$	<sup>1</sup> LEES	13B	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
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341.9	$^{+18.0}_{-19.6} \pm 23.1$	<sup>2</sup> POLUEKTOV 10	BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

278	$\pm 21 \pm 6$	<sup>3</sup> DEL-AMO-SA..10F	BABR	Repl. by LEES 13B
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297	$^{+27}_{-29} \pm 6.4$	<sup>4</sup> AUBERT	08AL BABR	Repl. by DEL-AMO-SANCHEZ 10F
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302.0	$^{+33.8}_{-35.1} \pm 23.7$	<sup>5</sup> POLUEKTOV 06	BELL	Repl. by POLUEKTOV 10
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296	$\pm 41$ $^{+20}_{-19}$	<sup>6</sup> AUBERT,B	05Y BABR	Repl. by AUBERT 08AL
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<sup>1</sup> Reports combination of published measurements using GGSZ, GLW, and ADS methods. We added  $360^\circ$  to the value of  $(-66^{+21}_{-31})^\circ$  quoted by LEES 13B.

<sup>2</sup> Uses Dalitz plot analysis of  $\bar{D}^0 \rightarrow K_S^0 \pi^+ \pi^-$  decays from  $B^+ \rightarrow D^* K^+$  modes. The corresponding two standard deviation interval is  $296.5^\circ < \delta_B^* < 382.7^\circ$ .

<sup>3</sup> Uses Dalitz plot analysis of  $\bar{D}^0 \rightarrow K_S^0 \pi^+ \pi^-$ ,  $K_S^0 K^+ K^-$  decays from  $B^+ \rightarrow D^{(*)} K^{(*)+}$  modes. The corresponding two standard deviation interval is  $236^\circ < \delta_B^* < 322^\circ$ .

<sup>4</sup> Uses Dalitz plot analysis of  $\bar{D}^0 \rightarrow K_S^0 \pi^+ \pi^-$  and  $\bar{D}^0 \rightarrow K_S^0 K^+ K^-$  decays coming from  $B^\pm \rightarrow D^{(*)} K^{(*)\pm}$  modes.

<sup>5</sup> Uses a Dalitz plot analysis of the  $\bar{D}^0 \rightarrow K_S^0 \pi^+ \pi^-$  decays; Combines the  $DK^+$ ,  $D^* K^+$  and  $DK^{*+}$  modes.

<sup>6</sup> Uses a Dalitz analysis of neutral  $D$  decays to  $K_S^0 \pi^+ \pi^-$  in the processes  $B^\pm \rightarrow D^{(*)} K^\pm, D^* \rightarrow D\pi^0, D\gamma$ .

### $A_{CP}(B^+ \rightarrow D_{CP(+1)}^{*0} K^+)$

VALUE	DOCUMENT ID	TECN	COMMENT
<b><math>-0.12 \pm 0.08</math> OUR AVERAGE</b>			
$-0.11 \pm 0.09 \pm 0.01$	AUBERT	08BF BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
$-0.20 \pm 0.22 \pm 0.04$	ABE	06 BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
$-0.10 \pm 0.23^{+0.03}_{-0.04}$	AUBERT	05N BABR	Repl. by AUBERT 08BF

### $A_{CP}(B^+ \rightarrow D_{CP(-1)}^* K^+)$

VALUE	DOCUMENT ID	TECN	COMMENT
<b><math>0.07 \pm 0.10</math> OUR AVERAGE</b>			
$+0.06 \pm 0.10 \pm 0.02$	AUBERT	08BF BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
$+0.13 \pm 0.30 \pm 0.08$	ABE	06 BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

### $A_{CP}(B^+ \rightarrow D_{CP(+1)} K^*(892)^+)$

VALUE	DOCUMENT ID	TECN	COMMENT
<b><math>+0.09 \pm 0.13 \pm 0.06</math></b>	AUBERT	09AJ BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
$-0.08 \pm 0.19 \pm 0.08$	AUBERT,B	05U BABR	Repl. by AUBERT 09AJ

### $A_{CP}(B^+ \rightarrow D_{CP(-1)} K^*(892)^+)$

VALUE	DOCUMENT ID	TECN	COMMENT
<b><math>-0.23 \pm 0.21 \pm 0.07</math></b>	AUBERT	09AJ BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
$-0.26 \pm 0.40 \pm 0.12$	AUBERT,B	05U BABR	Repl. by AUBERT 09AJ

### $A_{CP}(B^+ \rightarrow D_s^+ \phi)$

VALUE	DOCUMENT ID	TECN	COMMENT
<b><math>-0.01 \pm 0.41 \pm 0.03</math></b>	AAIJ	13R LHCB	$pp$ at 7 TeV

### $A_{CP}(B^+ \rightarrow D^{*+} \bar{D}^{*0})$

VALUE	DOCUMENT ID	TECN	COMMENT
<b><math>-0.15 \pm 0.11 \pm 0.02</math></b>	AUBERT,B	06A BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

### $A_{CP}(B^+ \rightarrow D^{*+} \bar{D}^0)$

VALUE	DOCUMENT ID	TECN	COMMENT
<b><math>-0.06 \pm 0.13 \pm 0.02</math></b>	AUBERT,B	06A BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

### $A_{CP}(B^+ \rightarrow D^+ \bar{D}^{*0})$

VALUE	DOCUMENT ID	TECN	COMMENT
<b><math>0.13 \pm 0.18 \pm 0.04</math></b>	AUBERT,B	06A BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

**$A_{CP}(B^+ \rightarrow D^+ \bar{D}^0)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>-0.03 \pm 0.07</math> OUR AVERAGE</b>			
$0.00 \pm 0.08 \pm 0.02$	ADACHI	08 BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
$-0.13 \pm 0.14 \pm 0.02$	AUBERT,B	06A BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

 **$A_{CP}(B^+ \rightarrow K_S^0 \pi^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>-0.017 \pm 0.016</math> OUR AVERAGE</b>			
$-0.022 \pm 0.025 \pm 0.010$	AAIJ	13BS LHCb	$pp$ at 7 TeV
$-0.011 \pm 0.021 \pm 0.006$	DUH	13 BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
$-0.029 \pm 0.039 \pm 0.010$	<sup>1</sup> AUBERT,BE	06c BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
$0.18 \pm 0.24$	<sup>2</sup> CHEN	00 CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$0.03 \pm 0.03 \pm 0.01$	LIN	07 BELL	Repl. by DUH 13
$-0.09 \pm 0.05 \pm 0.01$	<sup>3</sup> AUBERT,BE	05E BABR	Repl. by AUBERT,BE 06c
$0.05 \pm 0.05 \pm 0.01$	<sup>4</sup> CHAO	05A BELL	Repl. by LIN 07
$-0.05 \pm 0.08 \pm 0.01$	<sup>5</sup> AUBERT	04M BABR	Repl. by AUBERT,BE 05E
$0.07 \begin{smallmatrix} +0.09 \\ -0.08 \end{smallmatrix} \begin{smallmatrix} +0.01 \\ -0.03 \end{smallmatrix}$	<sup>6</sup> UNNO	03 BELL	Repl. by CHAO 05A
$0.46 \pm 0.15 \pm 0.02$	<sup>7</sup> CASEY	02 BELL	Repl. by UNNO 03
$0.098 \begin{smallmatrix} +0.430 \\ -0.343 \end{smallmatrix} \begin{smallmatrix} +0.020 \\ -0.063 \end{smallmatrix}$	<sup>8</sup> ABE	01K BELL	Repl. by CASEY 02
$-0.21 \pm 0.18 \pm 0.03$	<sup>9</sup> AUBERT	01E BABR	Repl. by AUBERT 04M

<sup>1</sup> Corresponds to 90% confidence range  $-0.092 < A_{CP} < 0.036$ .

<sup>2</sup> Corresponds to 90% confidence range  $-0.22 < A_{CP} < 0.56$ .

<sup>3</sup> Corresponds to 90% confidence range  $-0.16 < A_{CP} < -0.02$ .

<sup>4</sup> Corresponds to 90% confidence range  $-0.04 < A_{CP} < 0.13$ .

<sup>5</sup> Corresponds to 90% confidence range  $-0.18 < A_{CP} < 0.08$ .

<sup>6</sup> Corresponds to 90% confidence range  $-0.10 < A_{CP} < +0.22$ .

<sup>7</sup> Corresponds to 90% confidence range  $+0.19 < A_{CP} < +0.72$ .

<sup>8</sup> Corresponds to 90% confidence range  $-0.53 < A_{CP} < 0.82$ .

<sup>9</sup> Corresponds to 90% confidence range  $-0.51 < A_{CP} < 0.09$ .

 **$A_{CP}(B^+ \rightarrow K^+ \pi^0)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>0.037 \pm 0.021</math> OUR AVERAGE</b>			
$0.043 \pm 0.024 \pm 0.002$	DUH	13 BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
$0.030 \pm 0.039 \pm 0.010$	AUBERT	07BC BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
$-0.29 \pm 0.23$	<sup>1</sup> CHEN	00 CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$0.07 \pm 0.03 \pm 0.01$	LIN	08 BELL	Repl. by DUH 13
$0.06 \pm 0.06 \pm 0.01$	<sup>2</sup> AUBERT	05L BABR	Repl. by AUBERT 07BC
$0.06 \pm 0.06 \pm 0.02$	<sup>2</sup> CHAO	05A BELL	Repl. by CHAO 04B
$0.04 \pm 0.05 \pm 0.02$	<sup>3</sup> CHAO	04B BELL	Repl. by LIN 08
$-0.09 \pm 0.09 \pm 0.01$	<sup>4</sup> AUBERT	03L BABR	Repl. by AUBERT 05L
$-0.02 \pm 0.19 \pm 0.02$	<sup>5</sup> CASEY	02 BELL	Repl. by CHAO 04B
$-0.059 \begin{smallmatrix} +0.222 \\ -0.196 \end{smallmatrix} \begin{smallmatrix} +0.055 \\ -0.017 \end{smallmatrix}$	<sup>6</sup> ABE	01K BELL	Repl. by CASEY 02
$0.00 \pm 0.18 \pm 0.04$	<sup>7</sup> AUBERT	01E BABR	Repl. by AUBERT 03L

- <sup>1</sup> Corresponds to 90% confidence range  $-0.67 < A_{CP} < 0.09$ .  
<sup>2</sup> Corresponds to a 90% CL interval of  $-0.06 < A_{CP} < 0.18$ .  
<sup>3</sup> Corresponds to 90% CL interval of  $-0.05 < A_{CP} < 0.13$ .  
<sup>4</sup> Corresponds to 90% confidence range  $-0.24 < A_{CP} < 0.06$ .  
<sup>5</sup> Corresponds to 90% confidence range  $-0.35 < A_{CP} < +0.30$ .  
<sup>6</sup> Corresponds to 90% confidence range  $-0.40 < A_{CP} < 0.36$ .  
<sup>7</sup> Corresponds to 90% confidence range  $-0.30 < A_{CP} < +0.30$ .

 **$A_{CP}(B^+ \rightarrow \eta' K^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.004±0.011 OUR AVERAGE</b>			
$-0.002 \pm 0.012 \pm 0.006$	<sup>1</sup> AAIJ	150 LHCB	$pp$ at 7, 8 TeV
$0.008^{+0.017}_{-0.018} \pm 0.009$	AUBERT	09AV BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
$0.028 \pm 0.028 \pm 0.021$	SCHUEMANN	06 BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
$0.03 \pm 0.12$	<sup>2</sup> CHEN	00 CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
$0.010 \pm 0.022 \pm 0.006$	AUBERT	07AE BABR	Repl. by AUBERT 09AV
$0.033 \pm 0.028 \pm 0.005$	<sup>3</sup> AUBERT	05M BABR	Repl. by AUBERT 07AE
$0.037 \pm 0.045 \pm 0.011$	<sup>4</sup> AUBERT	03W BABR	Repl. by AUBERT 05M
$-0.11 \pm 0.11 \pm 0.02$	<sup>5</sup> AUBERT	02E BABR	Repl. by AUBERT 05M
$-0.015 \pm 0.070 \pm 0.009$	<sup>6</sup> CHEN	02B BELL	Repl. by SCHUEMANN 06
$0.06 \pm 0.15 \pm 0.01$	<sup>7</sup> ABE	01M BELL	Repl. by CHEN 02B

- <sup>1</sup> Obtained using  $A_{CP}(B^\pm \rightarrow J/\psi K^\pm) = (0.3 \pm 0.6) \times 10^{-2}$ .  
<sup>2</sup> Corresponds to 90% confidence range  $-0.17 < A_{CP} < 0.23$ .  
<sup>3</sup> Corresponds to 90% confidence range  $-0.012 < A_{CP} < 0.078$ .  
<sup>4</sup> Corresponds to 90% confidence range  $-0.04 < A_{CP} < 0.11$ .  
<sup>5</sup> Corresponds to 90% confidence range  $-0.28 < A_{CP} < 0.07$ .  
<sup>6</sup> Corresponds to 90% confidence range  $-0.13 < A_{CP} < 0.10$ .  
<sup>7</sup> Corresponds to 90% confidence range  $-0.20 < A_{CP} < 0.32$ .

 **$A_{CP}(B^+ \rightarrow \eta' K^*(892)^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>-0.26±0.27±0.02</b>			
	DEL-AMO-SA..10A	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
$-0.30^{+0.33}_{-0.37} \pm 0.02$	<sup>1</sup> AUBERT	07E BABR	Repl. by DEL-AMO-SANCHEZ 10A

- <sup>1</sup> Reports  $A_{CP}$  with the opposite sign convention.

 **$A_{CP}(B^+ \rightarrow \eta' K_0^*(1430)^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.06±0.20±0.02</b>			
	DEL-AMO-SA..10A	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

 **$A_{CP}(B^+ \rightarrow \eta' K_2^*(1430)^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.15±0.13±0.02</b>			
	DEL-AMO-SA..10A	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

**$A_{CP}(B^+ \rightarrow \eta K^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>-0.37 \pm 0.08</math> OUR AVERAGE</b>			
$-0.38 \pm 0.11 \pm 0.01$	HOI	12 BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
$-0.36 \pm 0.11 \pm 0.03$	AUBERT	09AV BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
$-0.22 \pm 0.11 \pm 0.01$	AUBERT	07AE BABR	Repl. by AUBERT 09AV
$-0.39 \pm 0.16 \pm 0.03$	CHANG	07B BELL	Repl. by HOI 12
$-0.20 \pm 0.15 \pm 0.01$	AUBERT,B	05K BABR	Repl. by AUBERT 07AE
$-0.49 \pm 0.31 \pm 0.07$	CHANG	05A BELL	Repl. by CHANG 07B
$-0.52 \pm 0.24 \pm 0.01$	AUBERT	04H BABR	Repl. by AUBERT,B 05K

 **$A_{CP}(B^+ \rightarrow \eta K^*(892)^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>0.02 \pm 0.06</math> OUR AVERAGE</b>			
$0.03 \pm 0.10 \pm 0.01$	WANG	07B BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
$0.01 \pm 0.08 \pm 0.02$	AUBERT,B	06H BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
$0.13 \pm 0.14 \pm 0.02$	AUBERT,B	04D BABR	Repl. by AUBERT,B 06H

 **$A_{CP}(B^+ \rightarrow \eta K_0^*(1430)^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>0.05 \pm 0.13 \pm 0.02</math></b>	AUBERT,B	06H BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

 **$A_{CP}(B^+ \rightarrow \eta K_2^*(1430)^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>-0.45 \pm 0.30 \pm 0.02</math></b>	AUBERT,B	06H BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

 **$A_{CP}(B^+ \rightarrow \omega K^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>-0.02 \pm 0.04</math> OUR AVERAGE</b>			
$-0.03 \pm 0.04 \pm 0.01$	CHOBANOVA	14 BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
$-0.01 \pm 0.07 \pm 0.01$	AUBERT	07AE BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
$0.05 \pm 0.09 \pm 0.01$	AUBERT,B	06E BABR	Repl. by AUBERT 07AE
$0.05^{+0.08}_{-0.07} \pm 0.01$	JEN	06 BELL	Repl. by CHOBANOVA 14
$-0.09 \pm 0.17 \pm 0.01$	AUBERT	04H BABR	Repl. by AUBERT,B 06E
$0.06^{+0.21}_{-0.18} \pm 0.01$	<sup>1</sup> WANG	04A BELL	Repl. by JEN 06
$-0.21 \pm 0.28 \pm 0.03$	<sup>2</sup> LU	02 BELL	Repl. by WANG 04A

<sup>1</sup> Corresponds to 90% CL interval  $0.15 < A_{CP} < 0.90$ <sup>2</sup> Corresponds to 90% confidence range  $-0.70 < A_{CP} < +0.38$ . **$A_{CP}(B^+ \rightarrow \omega K^{*+})$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>+0.29 \pm 0.35 \pm 0.02</math></b>	AUBERT	09H BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

**$A_{CP}(B^+ \rightarrow \omega(K\pi)_0^{*+})$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$-0.10 \pm 0.09 \pm 0.02$	AUBERT	09H BABR	$e^+e^- \rightarrow \gamma(4S)$

 **$A_{CP}(B^+ \rightarrow \omega K_2^*(1430)^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$+0.14 \pm 0.15 \pm 0.02$	AUBERT	09H BABR	$e^+e^- \rightarrow \gamma(4S)$

 **$A_{CP}(B^+ \rightarrow K^{*0}\pi^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$-0.04 \pm 0.09$ <b>OUR AVERAGE</b>	Error includes scale factor of 2.1.		

$0.032 \pm 0.052^{+0.016}_{-0.013}$	AUBERT	08AI BABR	$e^+e^- \rightarrow \gamma(4S)$
$-0.149 \pm 0.064 \pm 0.022$	GARMASH	06 BELL	$e^+e^- \rightarrow \gamma(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
$0.068 \pm 0.078^{+0.070}_{-0.067}$	AUBERT,B	05N BABR	Repl. by AUBERT 08AI

 **$A_{CP}(B^+ \rightarrow K^*(892)^+\pi^0)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$-0.06 \pm 0.24 \pm 0.04$	LEES	11I BABR	$e^+e^- \rightarrow \gamma(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$0.04 \pm 0.29 \pm 0.05$	AUBERT	05X BABR	Repl. by LEES 11I
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 **$A_{CP}(B^+ \rightarrow K^+\pi^-\pi^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$0.027 \pm 0.008$ <b>OUR AVERAGE</b>			

$0.025 \pm 0.004 \pm 0.008$	<sup>1</sup> AAIJ	14BO LHCB	$pp$ at 7, 8 TeV
$0.028 \pm 0.020 \pm 0.023$	AUBERT	08AI BABR	$e^+e^- \rightarrow \gamma(4S)$
$0.049 \pm 0.026 \pm 0.020$	GARMASH	06 BELL	$e^+e^- \rightarrow \gamma(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$0.032 \pm 0.008 \pm 0.008$	AAIJ	13AZ LHCB	Repl. by AAIJ 14BO
$-0.013 \pm 0.037 \pm 0.011$	AUBERT,B	05N BABR	Repl. by AUBERT 08AI
$0.01 \pm 0.07 \pm 0.03$	AUBERT	03M BABR	Repl. by AUBERT,B 05N

<sup>1</sup>AAIJ 14BO reports also  $CP$  asymmetries in restricted regions of phase space.

 **$A_{CP}(B^+ \rightarrow K^+K^-K^+ \text{nonresonant})$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$0.060 \pm 0.044 \pm 0.019$	LEES	12O BABR	$e^+e^- \rightarrow \gamma(4S)$

 **$A_{CP}(B^+ \rightarrow f(980)^0K^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$-0.08 \pm 0.08 \pm 0.04$	<sup>1</sup> LEES	12O BABR	$e^+e^- \rightarrow \gamma(4S)$

<sup>1</sup>Measured in the  $B^+ \rightarrow K^+K^-K^+$  decay.



**$A_{CP}(B^+ \rightarrow f_2(1270)K^+)$**

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>-0.68^{+0.19}_{-0.17}</math> OUR AVERAGE</b>			
$-0.85 \pm 0.22^{+0.26}_{-0.13}$	AUBERT	08AI	BABR $e^+e^- \rightarrow \gamma(4S)$
$-0.59 \pm 0.22 \pm 0.036$	GARMASH	06	BELL $e^+e^- \rightarrow \gamma(4S)$

**$A_{CP}(B^+ \rightarrow f_0(1500)K^+)$**

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>0.28 \pm 0.26^{+0.15}_{-0.14}</math></b>	AUBERT	08AI	BABR $e^+e^- \rightarrow \gamma(4S)$

**$A_{CP}(B^+ \rightarrow f'_2(1525)^0 K^+)$**

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>-0.08^{+0.05}_{-0.04}</math> OUR AVERAGE</b>			
$0.18 \pm 0.18 \pm 0.04$	<sup>1</sup> LEES	11I	BABR $e^+e^- \rightarrow \gamma(4S)$
$-0.106 \pm 0.050^{+0.036}_{-0.015}$	AUBERT	08AI	BABR $e^+e^- \rightarrow \gamma(4S)$
$-0.077 \pm 0.065^{+0.046}_{-0.026}$	GARMASH	06	BELL $e^+e^- \rightarrow \gamma(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
$0.14 \pm 0.10 \pm 0.04$	<sup>2</sup> LEES	12O	BABR $e^+e^- \rightarrow \gamma(4S)$
$-0.31 \pm 0.25 \pm 0.08$	<sup>3</sup> AUBERT	06O	BABR Repl. by LEES 12O
$0.088 \pm 0.095^{+0.097}_{-0.056}$	AUBERT,B	05N	BABR Repl. by AUBERT 08AI

<sup>1</sup> Measured in  $B^+ \rightarrow f_0 K^+$  with  $f_0 \rightarrow \pi^0 \pi^0$  decay.

<sup>2</sup> Measured in the  $B^+ \rightarrow K^+ K^- K^+$  decay assuming  $A_{CP}(B^+ \rightarrow f'_2(1525)^0 K^+) = A_{CP}(B^+ \rightarrow f_0(1500)^0 K^+) = A_{CP}(B^+ \rightarrow f_0(1710)^0 K^+)$

<sup>3</sup> Measured in the  $B^+ \rightarrow K^+ K^- K^+$  decay.

**$A_{CP}(B^+ \rightarrow \rho^0 K^+)$**

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>0.37 \pm 0.10</math> OUR AVERAGE</b>			
$0.44 \pm 0.10^{+0.06}_{-0.14}$	AUBERT	08AI	BABR $e^+e^- \rightarrow \gamma(4S)$
$0.30 \pm 0.11^{+0.11}_{-0.04}$	GARMASH	06	BELL $e^+e^- \rightarrow \gamma(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
$0.32 \pm 0.13^{+0.10}_{-0.08}$	AUBERT,B	05N	BABR Repl. by AUBERT 08AI

**$A_{CP}(B^+ \rightarrow K_0^*(1430)^0 \pi^+)$**

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>0.055 \pm 0.033</math> OUR AVERAGE</b>			
$0.032 \pm 0.035^{+0.034}_{-0.028}$	AUBERT	08AI	BABR $e^+e^- \rightarrow \gamma(4S)$
$0.076 \pm 0.038^{+0.028}_{-0.022}$	GARMASH	06	BELL $e^+e^- \rightarrow \gamma(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
$-0.064 \pm 0.032^{+0.023}_{-0.026}$	AUBERT,B	05N	BABR Repl. by AUBERT 08AI

**$A_{CP}(B^+ \rightarrow K_2^*(1430)^0 \pi^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$0.05 \pm 0.23^{+0.18}_{-0.08}$	AUBERT	08AI	BABR $e^+ e^- \rightarrow \Upsilon(4S)$

 **$A_{CP}(B^+ \rightarrow K^+ \pi^0 \pi^0)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$-0.06 \pm 0.06 \pm 0.04$	LEES	11I	BABR $e^+ e^- \rightarrow \Upsilon(4S)$

 **$A_{CP}(B^+ \rightarrow K^0 \rho^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$-0.12 \pm 0.17 \pm 0.02$	AUBERT	07Z	BABR $e^+ e^- \rightarrow \Upsilon(4S)$

 **$A_{CP}(B^+ \rightarrow K^{*+} \pi^+ \pi^-)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$0.07 \pm 0.07 \pm 0.04$	AUBERT,B	06U	BABR $e^+ e^- \rightarrow \Upsilon(4S)$

 **$A_{CP}(B^+ \rightarrow \rho^0 K^*(892)^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$0.31 \pm 0.13 \pm 0.03$	DEL-AMO-SA..11D	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$0.20^{+0.32}_{-0.29} \pm 0.04$	AUBERT	03V	BABR Repl. by DEL-AMO-SANCHEZ 11D
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 **$A_{CP}(B^+ \rightarrow K^*(892)^+ f_0(980))$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$-0.15 \pm 0.12 \pm 0.03$	DEL-AMO-SA..11D	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$-0.34 \pm 0.21 \pm 0.03$	AUBERT,B	06G	BABR Repl. by DEL-AMO-SANCHEZ 11D
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 **$A_{CP}(B^+ \rightarrow a_1^+ K^0)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$+0.12 \pm 0.11 \pm 0.02$	AUBERT	08F	BABR $e^+ e^- \rightarrow \Upsilon(4S)$

 **$A_{CP}(B^+ \rightarrow b_1^+ K^0)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$-0.03 \pm 0.15 \pm 0.02$	AUBERT	08AG	BABR $e^+ e^- \rightarrow \Upsilon(4S)$

 **$A_{CP}(B^+ \rightarrow K^*(892)^0 \rho^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$-0.01 \pm 0.16 \pm 0.02$	AUBERT,B	06G	BABR $e^+ e^- \rightarrow \Upsilon(4S)$

 **$A_{CP}(B^+ \rightarrow b_1^0 K^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$-0.46 \pm 0.20 \pm 0.02$	AUBERT	07BI	BABR $e^+ e^- \rightarrow \Upsilon(4S)$

**$A_{CP}(B^+ \rightarrow K^0 K^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>0.04 \pm 0.14</math> OUR AVERAGE</b>			
$0.014 \pm 0.168 \pm 0.002$	DUH	13 BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
$0.10 \pm 0.26 \pm 0.03$	<sup>1</sup> AUBERT,BE	06C BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
$0.13 \begin{smallmatrix} +0.23 \\ -0.24 \end{smallmatrix} \pm 0.02$	LIN	07 BELL	Repl. by DUH 13
$0.15 \pm 0.33 \pm 0.03$	<sup>2</sup> AUBERT,BE	05E BABR	Repl. by AUBERT,BE 06C
<sup>1</sup> Corresponds to 90% confidence range $-0.31 < A_{CP} < 0.54$ .			
<sup>2</sup> Corresponds to 90% confidence range $-0.43 < A_{CP} < 0.68$ .			

 **$A_{CP}(B^+ \rightarrow K_S^0 K^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>-0.21 \pm 0.14 \pm 0.01</math></b>	AAIJ	13BS LHCB	$pp$ at 7 TeV

 **$A_{CP}(B^+ \rightarrow K^+ K_S^0 K_S^0)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>0.04 \begin{smallmatrix} +0.04 \\ -0.05 \end{smallmatrix} \pm 0.02</math></b>	LEES	120 BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
$-0.04 \pm 0.11 \pm 0.02$	<sup>1</sup> AUBERT,B	04V BABR	Repl. by LEES 120
<sup>1</sup> Corresponds to 90% confidence range $-0.23 < A_{CP} < 0.15$ .			

 **$A_{CP}(B^+ \rightarrow K^+ K^- \pi^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>-0.118 \pm 0.022</math> OUR AVERAGE</b>			
$-0.123 \pm 0.017 \pm 0.014$	<sup>1</sup> AAIJ	14BO LHCB	$pp$ at 7, 8 TeV
$0.00 \pm 0.10 \pm 0.03$	AUBERT	07BB BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
$-0.141 \pm 0.040 \pm 0.019$	<sup>2</sup> AAIJ	14 LHCB	Repl. by AAIJ 14BO
<sup>1</sup> AAIJ 14BO reports also $CP$ asymmetries in restricted regions of phase space.			
<sup>2</sup> AAIJ 14 reports $A_{CP}(B^+ \rightarrow K^+ K^- \pi^+) = -0.648 \pm 0.070 \pm 0.013 \pm 0.007$ in the Dalitz plot region of $m_{K^+ K^-}^2 < 1.5 \text{ GeV}^2/c^4$ . The third uncertainty is due to the $CP$ asymmetry of the $B^\pm \rightarrow J/\psi K^\pm$ reference mode uncertainty.			

 **$A_{CP}(B^+ \rightarrow K^+ K^- K^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>-0.033 \pm 0.008</math> OUR AVERAGE</b>			
$-0.036 \pm 0.004 \pm 0.007$	<sup>1</sup> AAIJ	14BO LHCB	$pp$ at 7, 8 TeV
$-0.017 \begin{smallmatrix} +0.019 \\ -0.014 \end{smallmatrix} \pm 0.014$	<sup>2</sup> LEES	120 BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
$-0.043 \pm 0.009 \pm 0.008$	AAIJ	13AZ LHCB	Repl. by AAIJ 14BO
$-0.017 \pm 0.026 \pm 0.015$	AUBERT	06O BABR	Repl. by LEES 120
$0.02 \pm 0.07 \pm 0.03$	AUBERT	03M BABR	Repl. by AUBERT 06O
<sup>1</sup> AAIJ 14BO reports also $CP$ asymmetries in restricted regions of phase space.			
<sup>2</sup> All intermediate charmonium and charm resonances are removed, except of $\chi_{c0}$ .			

**$A_{CP}(B^+ \rightarrow \phi K^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>0.024 \pm 0.028</math> OUR AVERAGE</b>	Error includes scale factor of 2.3.		
$0.017 \pm 0.011 \pm 0.006$	<sup>1</sup> AAIJ	150	LHCB $pp$ at 7, 8 TeV
$0.128 \pm 0.044 \pm 0.013$	LEES	120	BABR $e^+e^- \rightarrow \Upsilon(4S)$
$-0.07 \pm 0.17 \begin{smallmatrix} +0.03 \\ -0.02 \end{smallmatrix}$	ACOSTA	05J	CDF $p\bar{p}$ at 1.96 TeV
$0.01 \pm 0.12 \pm 0.05$	<sup>2</sup> CHEN	03B	BELL $e^+e^- \rightarrow \Upsilon(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
$0.022 \pm 0.021 \pm 0.009$	AAIJ	14A	LHCB Repl. by AAIJ 150
$0.00 \pm 0.08 \pm 0.02$	AUBERT	06O	BABR Repl. by LEES 120
$0.04 \pm 0.09 \pm 0.01$	<sup>3</sup> AUBERT	04A	BABR Repl. by AUBERT 06O
$-0.05 \pm 0.20 \pm 0.03$	<sup>4</sup> AUBERT	02E	BABR $e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Obtained using  $A_{CP}(B^\pm \rightarrow J/\psi K^\pm) = (0.3 \pm 0.6) \times 10^{-2}$ .<sup>2</sup> Corresponds to 90% confidence range  $-0.20 < A_{CP} < 0.22$ .<sup>3</sup> Corresponds to 90% confidence range  $-0.10 < A_{CP} < 0.18$ .<sup>4</sup> Corresponds to 90% confidence range  $-0.37 < A_{CP} < 0.28$ . **$A_{CP}(B^+ \rightarrow X_0(1550) K^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>-0.04 \pm 0.07 \pm 0.02</math></b>	<sup>1</sup> AUBERT	06O	BABR $e^+e^- \rightarrow \Upsilon(4S)$

<sup>1</sup> Measured in the  $B^+ \rightarrow K^+ K^- K^+$  decay. **$A_{CP}(B^+ \rightarrow K^{*+} K^+ K^-)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>0.11 \pm 0.08 \pm 0.03</math></b>	AUBERT,B	06U	BABR $e^+e^- \rightarrow \Upsilon(4S)$

 **$A_{CP}(B^+ \rightarrow \phi K^*(892)^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>-0.01 \pm 0.08</math> OUR AVERAGE</b>			
$0.00 \pm 0.09 \pm 0.04$	AUBERT	07BA	BABR $e^+e^- \rightarrow \Upsilon(4S)$
$-0.02 \pm 0.14 \pm 0.03$	<sup>1</sup> CHEN	05A	BELL $e^+e^- \rightarrow \Upsilon(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
$0.16 \pm 0.17 \pm 0.03$	AUBERT	03V	BABR Repl. by AUBERT 07BA
$-0.13 \pm 0.29 \begin{smallmatrix} +0.08 \\ -0.11 \end{smallmatrix}$	<sup>2</sup> CHEN	03B	BELL Repl. by CHEN 05A
$-0.43 \begin{smallmatrix} +0.36 \\ -0.30 \end{smallmatrix} \pm 0.06$	<sup>3</sup> AUBERT	02E	BABR Repl. by AUBERT 03V

<sup>1</sup> Corresponds to 90% confidence range  $-0.25 < A_{CP} < 0.22$ .<sup>2</sup> Corresponds to 90% confidence range  $-0.64 < A_{CP} < 0.36$ .<sup>3</sup> Corresponds to 90% confidence range  $-0.88 < A_{CP} < 0.18$ . **$A_{CP}(B^+ \rightarrow \phi(K\pi)_0^{*+})$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>0.04 \pm 0.15 \pm 0.04</math></b>	AUBERT	08BI	BABR $e^+e^- \rightarrow \Upsilon(4S)$

 **$A_{CP}(B^+ \rightarrow \phi K_1(1270)^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>0.15 \pm 0.19 \pm 0.05</math></b>	AUBERT	08BI	BABR $e^+e^- \rightarrow \Upsilon(4S)$

**$A_{CP}(B^+ \rightarrow \phi K_2^*(1430)^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>-0.23 \pm 0.19 \pm 0.06</math></b>	AUBERT	08BI	BABR $e^+e^- \rightarrow \Upsilon(4S)$

 **$A_{CP}(B^+ \rightarrow K^+ \phi \phi)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>-0.10 \pm 0.08 \pm 0.02</math></b>	<sup>1</sup> LEES	11A	BABR $e^+e^- \rightarrow \Upsilon(4S)$
$^1 m_{\phi\phi} < 2.85 \text{ GeV}/c^2$ .			

 **$A_{CP}(B^+ \rightarrow K^+[\phi\phi]\eta_c)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>0.09 \pm 0.10 \pm 0.02</math></b>	<sup>1</sup> LEES	11A	BABR $e^+e^- \rightarrow \Upsilon(4S)$
$^1 m_{\phi\phi}$ is consistent with $\eta_c$ mass [2.94, 3.02] $\text{GeV}/c^2$ .			

 **$A_{CP}(B^+ \rightarrow K^*(892)^+ \gamma)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>+0.018 \pm 0.028 \pm 0.007</math></b>	AUBERT	09AO	BABR $e^+e^- \rightarrow \Upsilon(4S)$

 **$A_{CP}(B^+ \rightarrow \eta K^+ \gamma)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>-0.12 \pm 0.07</math> OUR AVERAGE</b>			
$-0.09 \pm 0.10 \pm 0.01$	<sup>1</sup> AUBERT	09	BABR $e^+e^- \rightarrow \Upsilon(4S)$
$-0.16 \pm 0.09 \pm 0.06$	<sup>2</sup> NISHIDA	05	BELL $e^+e^- \rightarrow \Upsilon(4S)$
••• We do not use the following data for averages, fits, limits, etc. •••			
$-0.09 \pm 0.12 \pm 0.01$	<sup>1</sup> AUBERT,B	06M	BABR Repl. by AUBERT 09
$^1 m_{\eta K} < 3.25 \text{ GeV}/c^2$ .			
$^2 m_{\eta K} < 2.4 \text{ GeV}/c^2$			

 **$A_{CP}(B^+ \rightarrow \phi K^+ \gamma)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>-0.13 \pm 0.11</math> OUR AVERAGE</b>	Error includes scale factor of 1.1.		
$-0.03 \pm 0.11 \pm 0.08$	SAHOO	11A	BELL $e^+e^- \rightarrow \Upsilon(4S)$
$-0.26 \pm 0.14 \pm 0.05$	AUBERT	07Q	BABR $e^+e^- \rightarrow \Upsilon(4S)$

 **$A_{CP}(B^+ \rightarrow \rho^+ \gamma)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>-0.11 \pm 0.32 \pm 0.09</math></b>	TANIGUCHI	08	BELL $e^+e^- \rightarrow \Upsilon(4S)$

 **$A_{CP}(B^+ \rightarrow \pi^+ \pi^0)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>0.03 \pm 0.04</math> OUR AVERAGE</b>			
$0.025 \pm 0.043 \pm 0.007$	DUH	13	BELL $e^+e^- \rightarrow \Upsilon(4S)$
$0.03 \pm 0.08 \pm 0.01$	AUBERT	07BC	BABR $e^+e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$0.07 \pm 0.06 \pm 0.01$	LIN	08	BELL	Repl. by DUH 13
$-0.01 \pm 0.10 \pm 0.02$	<sup>1</sup> AUBERT	05L	BABR	Repl. by AUBERT 07BC
$0.00 \pm 0.10 \pm 0.02$	<sup>2</sup> CHAO	05A	BELL	Repl. by CHAO 04B
$-0.02 \pm 0.10 \pm 0.01$	<sup>3</sup> CHAO	04B	BELL	Repl. by LIN 08
$-0.03 \begin{smallmatrix} +0.18 \\ -0.17 \end{smallmatrix} \pm 0.02$	<sup>4</sup> AUBERT	03L	BABR	Repl. by AUBERT 05L
$0.30 \pm 0.30 \begin{smallmatrix} +0.06 \\ -0.04 \end{smallmatrix}$	<sup>5</sup> CASEY	02	BELL	Repl. by CHAO 04B

<sup>1</sup> Corresponds to a 90% CL interval of  $-0.19 < A_{CP} < 0.21$ .

<sup>2</sup> Corresponds to a 90% CL interval of  $-0.17 < A_{CP} < 0.16$ .

<sup>3</sup> This corresponds to 90% CL interval of  $-0.18 < A_{CP} < 0.14$ .

<sup>4</sup> Corresponds to 90% confidence range  $-0.32 < A_{CP} < 0.27$ .

<sup>5</sup> Corresponds to 90% confidence range  $-0.23 < A_{CP} < +0.86$ .

### $A_{CP}(B^+ \rightarrow \pi^+ \pi^- \pi^+)$

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>0.057 \pm 0.013</math> OUR AVERAGE</b>			
$0.058 \pm 0.008 \pm 0.011$	<sup>1</sup> AAIJ	14B0	LHCB $pp$ at 7, 8 TeV
$0.032 \pm 0.044 \begin{smallmatrix} +0.040 \\ -0.037 \end{smallmatrix}$	AUBERT	09L	BABR $e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$0.117 \pm 0.021 \pm 0.011$	<sup>2</sup> AAIJ	14	LHCB	Repl. by AAIJ 14B0
$-0.007 \pm 0.077 \pm 0.025$	AUBERT,B	05G	BABR	Repl. by AUBERT 09L
$-0.39 \pm 0.33 \pm 0.12$	AUBERT	03M	BABR	Repl. by AUBERT 05G

<sup>1</sup> AAIJ 14B0 reports also  $CP$  asymmetries in restricted regions of phase space.

<sup>2</sup> AAIJ 14 reports  $A_{CP}(B^+ \rightarrow \pi^+ \pi^- \pi^+) = 0.584 \pm 0.082 \pm 0.027 \pm 0.007$  in the Dalitz plot region of  $m_{\pi^+ \pi^-}^2 > 15 \text{ GeV}^2/c^4$  or  $m_{\pi^+ \pi^-}^2 < 0.4 \text{ GeV}^2/c^4$ . The third uncertainty is due to the  $CP$  asymmetry of the  $B^\pm \rightarrow J/\psi K^\pm$  reference mode uncertainty.

### $A_{CP}(B^+ \rightarrow \rho^0 \pi^+)$

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>0.18 \pm 0.07 \begin{smallmatrix} +0.05 \\ -0.15 \end{smallmatrix}</math></b>	AUBERT	09L	BABR $e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$-0.074 \pm 0.120 \begin{smallmatrix} +0.035 \\ -0.055 \end{smallmatrix}$	AUBERT,B	05G	BABR	Repl. by AUBERT 09L
$-0.19 \pm 0.11 \pm 0.02$	AUBERT	04Z	BABR	Repl. by AUBERT,B 05G

### $A_{CP}(B^+ \rightarrow f_2(1270) \pi^+)$

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>0.41 \pm 0.25 \begin{smallmatrix} +0.18 \\ -0.15 \end{smallmatrix}</math></b>	AUBERT	09L	BABR $e^+ e^- \rightarrow \Upsilon(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$-0.004 \pm 0.247 \begin{smallmatrix} +0.028 \\ -0.032 \end{smallmatrix}$	AUBERT,B	05G	BABR	Repl. by AUBERT 09L
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### $A_{CP}(B^+ \rightarrow \rho^0(1450) \pi^+)$

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>-0.06 \pm 0.28 \begin{smallmatrix} +0.23 \\ -0.40 \end{smallmatrix}</math></b>	AUBERT	09L	BABR $e^+ e^- \rightarrow \Upsilon(4S)$

**$A_{CP}(B^+ \rightarrow f_0(1370)\pi^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>0.72 \pm 0.15 \pm 0.16</math></b>	AUBERT	09L	BABR $e^+e^- \rightarrow \gamma(4S)$

 **$A_{CP}(B^+ \rightarrow \pi^+\pi^-\pi^+ \text{ nonresonant})$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>-0.14 \pm 0.14^{+0.18}_{-0.08}</math></b>	AUBERT	09L	BABR $e^+e^- \rightarrow \gamma(4S)$

 **$A_{CP}(B^+ \rightarrow \rho^+\pi^0)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>0.02 \pm 0.11</math> OUR AVERAGE</b>			
$-0.01 \pm 0.13 \pm 0.02$	AUBERT	07X	BABR $e^+e^- \rightarrow \gamma(4S)$
$0.06 \pm 0.17^{+0.04}_{-0.05}$	ZHANG	05A	BELL $e^+e^- \rightarrow \gamma(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$0.24 \pm 0.16 \pm 0.06$	AUBERT	04Z	BABR Repl. by AUBERT 07X
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 **$A_{CP}(B^+ \rightarrow \rho^+\rho^0)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>-0.05 \pm 0.05</math> OUR AVERAGE</b>			
$-0.054 \pm 0.055 \pm 0.010$	AUBERT	09G	BABR $e^+e^- \rightarrow \gamma(4S)$
$0.00 \pm 0.22 \pm 0.03$	ZHANG	03B	BELL $e^+e^- \rightarrow \gamma(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$-0.12 \pm 0.13 \pm 0.10$	AUBERT,BE	06G	BABR Repl. by AUBERT 09G
$-0.19 \pm 0.23 \pm 0.03$	AUBERT	03V	BABR Repl. by AUBERT,BE 06G

 **$A_{CP}(B^+ \rightarrow \omega\pi^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>-0.04 \pm 0.06</math> OUR AVERAGE</b>			
$-0.02 \pm 0.08 \pm 0.01$	AUBERT	07AE	BABR $e^+e^- \rightarrow \gamma(4S)$
$-0.02 \pm 0.09 \pm 0.01$	JEN	06	BELL $e^+e^- \rightarrow \gamma(4S)$
$-0.34 \pm 0.25$	<sup>1</sup> CHEN	00	CLE2 $e^+e^- \rightarrow \gamma(4S)$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$-0.01 \pm 0.10 \pm 0.01$	AUBERT,B	06E	BABR Repl. by AUBERT 07AE
$0.03 \pm 0.16 \pm 0.01$	AUBERT	04H	BABR Repl. by AUBERT,B 06E
$0.50^{+0.23}_{-0.20} \pm 0.02$	<sup>2</sup> WANG	04A	BELL Repl. by JEN 06
$-0.01^{+0.29}_{-0.31} \pm 0.03$	<sup>3</sup> AUBERT	02E	BABR Repl. by AUBERT 04H

<sup>1</sup> Corresponds to 90% confidence range  $-0.75 < A_{CP} < 0.07$ .

<sup>2</sup> Corresponds to 90% CL interval  $-0.25 < A_{CP} < 0.41$

<sup>3</sup> Corresponds to 90% confidence range  $-0.50 < A_{CP} < 0.46$ .

 **$A_{CP}(B^+ \rightarrow \omega\rho^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>-0.20 \pm 0.09 \pm 0.02</math></b>	AUBERT	09H	BABR $e^+e^- \rightarrow \gamma(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
$0.04 \pm 0.18 \pm 0.02$	AUBERT,B	06T	BABR Repl. by AUBERT 09H
$0.05 \pm 0.26 \pm 0.02$	AUBERT	05O	BABR Repl. by AUBERT,B 06T

**$A_{CP}(B^+ \rightarrow \eta\pi^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>-0.14 \pm 0.07</math> OUR AVERAGE</b>	Error includes scale factor of 1.4.		
$-0.19 \pm 0.06 \pm 0.01$	HOI	12 BELL	$e^+e^- \rightarrow \Upsilon(4S)$
$-0.03 \pm 0.09 \pm 0.03$	AUBERT	09AV BABR	$e^+e^- \rightarrow \Upsilon(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
$-0.08 \pm 0.10 \pm 0.01$	AUBERT	07AE BABR	Repl. by AUBERT 09AV
$-0.23 \pm 0.09 \pm 0.02$	CHANG	07B BELL	Repl. by HOI 12
$-0.13 \pm 0.12 \pm 0.01$	AUBERT,B	05K BABR	Repl. by AUBERT 07AE
$0.07 \pm 0.15 \pm 0.03$	CHANG	05A BELL	Repl. by CHANG 07B
$-0.44 \pm 0.18 \pm 0.01$	AUBERT	04H BABR	Repl. by AUBERT,B 05K

 **$A_{CP}(B^+ \rightarrow \eta\rho^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>0.11 \pm 0.11</math> OUR AVERAGE</b>			
$0.13 \pm 0.11 \pm 0.02$	AUBERT	08AH BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$-0.04^{+0.34}_{-0.32} \pm 0.01$	WANG	07B BELL	$e^+e^- \rightarrow \Upsilon(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
$0.02 \pm 0.18 \pm 0.02$	AUBERT,B	05K BABR	Repl. by AUBERT 08AH

 **$A_{CP}(B^+ \rightarrow \eta'\pi^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>0.06 \pm 0.16</math> OUR AVERAGE</b>			
$0.03 \pm 0.17 \pm 0.02$	AUBERT	09AV BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$0.20^{+0.37}_{-0.36} \pm 0.04$	SCHUEMANN	06 BELL	$e^+e^- \rightarrow \Upsilon(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
$0.21 \pm 0.17 \pm 0.01$	AUBERT	07AE BABR	Repl. by AUBERT 09AV
$0.14 \pm 0.16 \pm 0.01$	AUBERT,B	05K BABR	Repl. by AUBERT 07AE

 **$A_{CP}(B^+ \rightarrow \eta'\rho^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>0.26 \pm 0.17 \pm 0.02</math></b>	DEL-AMO-SA..10A	BABR	$e^+e^- \rightarrow \Upsilon(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
$0.04 \pm 0.28 \pm 0.02$	<sup>1</sup> AUBERT	07E BABR	Repl. by DEL-AMO-SANCHEZ 10A

<sup>1</sup> Reports  $A_{CP}$  with the opposite sign convention.

 **$A_{CP}(B^+ \rightarrow b_1^0\pi^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>+0.05 \pm 0.16 \pm 0.02</math></b>	AUBERT	07BI BABR	$e^+e^- \rightarrow \Upsilon(4S)$

 **$A_{CP}(B^+ \rightarrow p\bar{p}\pi^+)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>0.00 \pm 0.04</math> OUR AVERAGE</b>			
$-0.02 \pm 0.05 \pm 0.02$	<sup>1</sup> WEI	08 BELL	$e^+e^- \rightarrow \Upsilon(4S)$
$+0.04 \pm 0.07 \pm 0.04$	AUBERT	07AV BABR	$e^+e^- \rightarrow \Upsilon(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
$-0.16 \pm 0.22 \pm 0.01$	WANG	04 BELL	Repl. by WEI 08
<sup>1</sup> Requires $m_{p\bar{p}} < 2.85 \text{ GeV}/c^2$ .			



### $A_{CP}(B^+ \rightarrow p\bar{p}K^+)$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.00 ± 0.04 OUR AVERAGE</b>	Error includes scale factor of 2.2.		
0.021 ± 0.020 ± 0.004	<sup>1</sup> AAIJ	14AF LHCb	$pp$ at 7, 8 TeV
-0.17 ± 0.10 ± 0.02	<sup>1</sup> WEI	08 BELL	$e^+e^- \rightarrow \gamma(4S)$
-0.16 $^{+0.07}_{-0.08}$ ± 0.04	<sup>1</sup> AUBERT,B	05L BABR	$e^+e^- \rightarrow \gamma(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
-0.047 ± 0.036 ± 0.007	<sup>1</sup> AAIJ	13AU LHCb	Repl. by AAIJ 14AF
-0.05 ± 0.11 ± 0.01	WANG	04 BELL	Repl. by WEI 08
<sup>1</sup> Requires $m_{p\bar{p}} < 2.85 \text{ GeV}/c^2$ .			

### $A_{CP}(B^+ \rightarrow p\bar{p}K^*(892)^+)$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.21 ± 0.16 OUR AVERAGE</b>	Error includes scale factor of 1.4.		
-0.01 ± 0.19 ± 0.02	CHEN	08C BELL	$e^+e^- \rightarrow \gamma(4S)$
+0.32 ± 0.13 ± 0.05	AUBERT	07AV BABR	$e^+e^- \rightarrow \gamma(4S)$

### $A_{CP}(B^+ \rightarrow p\bar{\Lambda}\gamma)$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>+0.17 ± 0.16 ± 0.05</b>	WANG	07C BELL	$e^+e^- \rightarrow \gamma(4S)$

### $A_{CP}(B^+ \rightarrow p\bar{\Lambda}\pi^0)$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>+0.01 ± 0.17 ± 0.04</b>	WANG	07C BELL	$e^+e^- \rightarrow \gamma(4S)$

### $A_{CP}(B^+ \rightarrow K^+\ell^+\ell^-)$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>-0.02 ± 0.08 OUR AVERAGE</b>			
-0.03 ± 0.14 ± 0.01	<sup>1</sup> LEES	12S BABR	$e^+e^- \rightarrow \gamma(4S)$
-0.18 ± 0.18 ± 0.01	AUBERT	09T BABR	$e^+e^- \rightarrow \gamma(4S)$
+0.04 ± 0.10 ± 0.02	WEI	09A BELL	$e^+e^- \rightarrow \gamma(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
-0.07 ± 0.22 ± 0.02	AUBERT,B	06J BABR	Repl. by AUBERT 09T
<sup>1</sup> Measured in the union of $0.10 < q^2 < 8.12 \text{ GeV}^2/c^4$ and $q^2 > 10.11 \text{ GeV}^2/c^4$ . LEES 12S reports also individual measurements $A_{CP}(B^+ \rightarrow K^+\ell^+\ell^-) = 0.02 \pm 0.18 \pm 0.01$ for $0.10 < q^2 < 8.12 \text{ GeV}^2/c^4$ and $A_{CP}(B^+ \rightarrow K^+\ell^+\ell^-) = -0.06 ^{+0.22}_{-0.21} ± 0.01 for q^2 > 10.11 \text{ GeV}^2/c^4.$			

### $A_{CP}(B^+ \rightarrow K^+e^+e^-)$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>+0.14 ± 0.14 ± 0.03</b>	WEI	09A BELL	$e^+e^- \rightarrow \gamma(4S)$

### $A_{CP}(B^+ \rightarrow K^+\mu^+\mu^-)$

VALUE	DOCUMENT ID	TECN	COMMENT
<b>0.011 ± 0.017 OUR AVERAGE</b>			
0.012 ± 0.017 ± 0.001	AAIJ	14AN LHCb	$pp$ at 7, 8 TeV
-0.05 ± 0.13 ± 0.03	WEI	09A BELL	$e^+e^- \rightarrow \gamma(4S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
0.000 ± 0.033 ± 0.009	AAIJ	13BN LHCb	Repl. by AAIJ 14AN

**$A_{CP}(B^+ \rightarrow \pi^+ \mu^+ \mu^-)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>-0.11 \pm 0.12 \pm 0.01</math></b>	AAIJ	15AR LHCB	$pp$ at 7, 8 TeV

 **$A_{CP}(B^+ \rightarrow K^{*+} \ell^+ \ell^-)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>-0.09 \pm 0.14</math> OUR AVERAGE</b>			

$0.01^{+0.26}_{-0.24} \pm 0.02$	AUBERT	09T BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
$-0.13^{+0.17}_{-0.16} \pm 0.01$	WEI	09A BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
$0.03 \pm 0.23 \pm 0.03$	AUBERT,B	06J BABR	Repl. by AUBERT 09T

 **$A_{CP}(B^+ \rightarrow K^* e^+ e^-)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>-0.14^{+0.23}_{-0.22} \pm 0.02</math></b>	WEI	09A BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

 **$A_{CP}(B^+ \rightarrow K^* \mu^+ \mu^-)$** 

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>-0.12 \pm 0.24 \pm 0.02</math></b>	WEI	09A BELL	$e^+ e^- \rightarrow \Upsilon(4S)$

 **$\gamma(B^+ \rightarrow D^{(*)0} K^{(*)+})$** 

For angle  $\gamma(\phi_3)$  of the CKM unitarity triangle, see the review on “CP Violation” in the Reviews section.

<u>VALUE (°)</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>70 \pm 9</math> OUR AVERAGE</b>				
62 $^{+15}_{-14}$		1 AAIJ	14BA LHCB	$pp$ at 7, 8 TeV
69 $^{+17}_{-16}$		2 LEES	13B BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
78.4 $^{+10.8}_{-11.6} \pm 9.6$		3 POLUEKTOV 10	BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
84 $^{+49}_{-42}$		4 AAIJ	14BE LHCB	Repl. by AAIJ 14BA
72.6 $^{+9.7}_{-17.2}$		5 AAIJ	13AK LHCB	$pp$ at 7 TeV
44 $^{+43}_{-38}$		6,7 AAIJ	12AQ LHCB	Repl. by AAIJ 13AK
77.3 $^{+15.1}_{-14.9} \pm 5.9$		7,8 AIHARA	12 BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
68 $\pm 14 \pm 5$		9 DEL-AMO-SA..10F	BABR	Repl. by LEES 13B
7 to 173	95	10 DEL-AMO-SA..10G	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
76 $^{+22}_{-23} \pm 7.1$		11 AUBERT	08AL BABR	Repl. by DEL-AMO-SANCHEZ 10F
53 $^{+15}_{-18} \pm 10$		12 POLUEKTOV 06	BELL	Repl. by POLUEKTOV 10
70 $\pm 31 \begin{smallmatrix} +18 \\ -15 \end{smallmatrix}$		13 AUBERT,B	05Y BABR	Repl. by AUBERT 08AL
77 $^{+17}_{-19} \pm 17$		14 POLUEKTOV 04	BELL	Repl. by POLUEKTOV 06

- <sup>1</sup> Uses binned Dalitz plot analysis of  $B^+ \rightarrow DK^+$  decays, with  $D \rightarrow K_S^0 \pi^+ \pi^-$  and  $D \rightarrow K_S^0 K^+ K^-$ . Strong phase measurements from CLEO-c (LIBBY 10) of the  $D$  decay over the Dalitz plot are used as input. Solution that satisfies  $0 < \gamma < 180$  is chosen.
- <sup>2</sup> Reports combination of published measurements using GGSZ, GLW, and ADS methods. Reports also  $2\sigma$  range of  $41\text{--}102^\circ$  and a  $5.9\sigma$  significance for  $\gamma(B^+ \rightarrow D^{(*)0} K^{(*)+}) \neq 0$  hypothesis.
- <sup>3</sup> Uses Dalitz plot analysis of  $\bar{D}^0 \rightarrow K_S^0 \pi^+ \pi^-$  decays from  $B^+ \rightarrow D^{(*)} K^+$  modes. The corresponding two standard deviation interval for  $\gamma$  is  $54.2^\circ < \gamma < 100.5^\circ$ . CP conservation in the combined result is ruled out with a significance of 3.5 standard deviations.
- <sup>4</sup> AAIJ 14BE uses model-dependent analysis of  $D \rightarrow K_S^0 \pi^+ \pi^-$  amplitudes. The model is the same as in DEL-AMO-SANCHEZ 10F.
- <sup>5</sup> Presents a confidence region  $55.4^\circ < \gamma < 82.3^\circ$  at 68% CL with best fit value  $72.6^\circ$  and includes both statistical and systematic uncertainties. The corresponding 95% CL is  $40.2^\circ < \gamma < 92.7^\circ$ . The value is determined from combination of measurements using  $D$  meson decaying to  $K^+ K^-$ ,  $\pi^+ \pi^-$ ,  $K^\pm \pi^\mp$ ,  $K_S^0 \pi^+ \pi^-$ ,  $K_S^0 K^+ K^-$ , and  $K^\pm \pi^\mp \pi^\pm \pi^\mp$ . Combines  $B^\pm \rightarrow DK^\pm$  and  $B^\pm \rightarrow D\pi^\pm$ .
- <sup>6</sup> Reports combined statistical and systematic uncertainties.
- <sup>7</sup> Uses binned Dalitz plot of  $\bar{D}^0 \rightarrow K_S^0 \pi^+ \pi^-$  decays from  $B^+ \rightarrow \bar{D}^0 K^+$ . Measurement of strong phases in  $\bar{D}^0 \rightarrow K_S^0 \pi^+ \pi^-$  Dalitz plot from LIBBY 10 is used as input.
- <sup>8</sup> We combined the systematics in quadrature. The authors report separately the contribution to the systematic uncertainty due to the uncertainty on the bin-averaged strong phase difference between  $D^0$  and  $\bar{D}^0$  amplitudes.
- <sup>9</sup> Uses Dalitz plot analysis of  $\bar{D}^0 \rightarrow K_S^0 \pi^+ \pi^-$ ,  $K_S^0 K^+ K^-$  decays from  $B^+ \rightarrow D^{(*)} K^+$ ,  $DK^{*+}$  modes. The corresponding two standard deviation interval for  $\gamma$  is  $39^\circ < \gamma < 98^\circ$ . CP conservation in the combined result is ruled out with a significance of 3.5 standard deviations.
- <sup>10</sup> Reports confidence intervals for the CKM angle  $\gamma$  from the measured values of the GLW parameters using  $B^\pm \rightarrow DK^\pm$  decays with  $D$  mesons decaying to non- $CP(K\pi)$ ,  $CP$ -even ( $K^+ K^-$ ,  $\pi^+ \pi^-$ ), and  $CP$ -odd ( $K_S^0 \pi^0$ ,  $K_S^0 \omega$ ) states.
- <sup>11</sup> Uses Dalitz plot analysis of  $\bar{D}^0 \rightarrow K_S^0 \pi^+ \pi^-$  and  $\bar{D}^0 \rightarrow K_S^0 K^+ K^-$  decays coming from  $B^\pm \rightarrow D^{(*)} K^{(*)\pm}$  modes. The corresponding two standard deviation interval is  $29^\circ < \gamma < 122^\circ$ .
- <sup>12</sup> Uses a Dalitz plot analysis of the  $\bar{D}^0 \rightarrow K_S^0 \pi^+ \pi^-$  decays; Combines the  $DK^+$ ,  $D^* K^+$  and  $DK^{*+}$  modes. The corresponding two standard deviations interval for gamma is  $8^\circ < \gamma < 111^\circ$ .
- <sup>13</sup> Uses a Dalitz plot analysis of neutral  $D \rightarrow K_S^0 \pi^+ \pi^-$  decays coming from  $B^\pm \rightarrow DK^\pm$  and  $B^\pm \rightarrow D^{*0} K^\pm$  followed by  $D^{*0} \rightarrow D\pi^0$ ,  $D\gamma$ . The corresponding two standard deviations interval for gamma is  $12^\circ < \gamma < 137^\circ$ . AUBERT,B 05Y also reports the amplitude ratios and the strong phases.
- <sup>14</sup> Uses a Dalitz plot analysis of the 3-body  $D \rightarrow K_S^0 \pi^+ \pi^-$  decays coming from  $B^\pm \rightarrow DK^\pm$  and  $B^\pm \rightarrow D^* K^\pm$  followed by  $D^* \rightarrow D\pi^0$ ; here we use  $D$  to denote that the neutral  $D$  meson produced in the decay is an admixture of  $D^0$  and  $\bar{D}^0$ . The corresponding two standard deviations interval for  $\gamma$  is  $26^\circ < \gamma < 126^\circ$ . POLUEKTOV 04 also reports the amplitude ratios and the strong phases.

### $\gamma(B^+ \rightarrow DK^+ \pi^- \pi^+, D\pi^+ \pi^- \pi^+)$

VALUE ( $^\circ$ )	DOCUMENT ID	TECN	COMMENT
$74^{+20}_{-19}$	AAIJ	15BC LHCB	$pp$ at 7, 8 TeV

## PARTIAL BRANCHING FRACTIONS

 $B(B^+ \rightarrow K^{*+} \ell^+ \ell^-) (q^2 < 2.0 \text{ GeV}^2/c^4)$ 

<u>VALUE (units <math>10^{-7}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>1.4 <math>\pm 0.5</math> OUR AVERAGE</b>			
1.37 $^{+0.60}_{-0.58}$	AAIJ	12AH LHCB	$pp$ at 7 TeV
1.30 $\pm 0.98 \pm 0.14$	AALTONEN	11AI CDF	$p\bar{p}$ at 1.96 TeV

 $B(B^+ \rightarrow K^{*+} \ell^+ \ell^-) (2.0 < q^2 < 4.3 \text{ GeV}^2/c^4)$ 

<u>VALUE (units <math>10^{-7}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>1.1 <math>\pm 0.5</math> OUR AVERAGE</b>			
1.24 $^{+0.60}_{-0.55}$	AAIJ	12AH LHCB	$pp$ at 7 TeV
0.71 $\pm 1.00 \pm 0.15$	AALTONEN	11AI CDF	$p\bar{p}$ at 1.96 TeV

 $B(B^+ \rightarrow K^{*+} \ell^+ \ell^-) (4.3 < q^2 < 8.68 \text{ GeV}^2/c^4)$ 

<u>VALUE (units <math>10^{-7}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>2.4 <math>^{+0.8}_{-0.7}</math> OUR AVERAGE</b>			
2.50 $^{+0.88}_{-0.74}$	AAIJ	12AH LHCB	$pp$ at 7 TeV
1.71 $\pm 1.58 \pm 0.49$	AALTONEN	11AI CDF	$p\bar{p}$ at 1.96 TeV

 $B(B^+ \rightarrow K^{*+} \ell^+ \ell^-) (10.09 < q^2 < 12.86 \text{ GeV}^2/c^4)$ 

<u>VALUE (units <math>10^{-7}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>2.1 <math>\pm 0.6</math> OUR AVERAGE</b>			
2.13 $^{+0.72}_{-0.66}$	AAIJ	12AH LHCB	$pp$ at 7 TeV
1.97 $\pm 0.99 \pm 0.22$	AALTONEN	11AI CDF	$p\bar{p}$ at 1.96 TeV

 $B(B^+ \rightarrow K^{*+} \ell^+ \ell^-) (14.18 < q^2 < 16.0 \text{ GeV}^2/c^4)$ 

<u>VALUE (units <math>10^{-7}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.86 <math>^{+0.40}_{-0.32}</math> OUR AVERAGE</b>			
1.00 $^{+0.47}_{-0.38}$	AAIJ	12AH LHCB	$pp$ at 7 TeV
0.52 $\pm 0.61 \pm 0.09$	AALTONEN	11AI CDF	$p\bar{p}$ at 1.96 TeV

 $B(B^+ \rightarrow K^{*+} \ell^+ \ell^-) (15.0 < q^2 < 19.0 \text{ GeV}^2/c^4)$ 

<u>VALUE (units <math>10^{-7}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>1.58 <math>^{+0.32}_{-0.29} \pm 0.11</math></b>	<sup>1</sup> AAIJ	14M LHCB	$pp$ at 7, 8 TeV

<sup>1</sup> Uses  $B(B^+ \rightarrow J/\psi(1S) K^*(892)^+) = (1.431 \pm 0.027 \pm 0.090) \times 10^{-3}$  for normalization and  $\mu^+ \mu^-$  as a lepton pair.

**$B(B^+ \rightarrow K^{*+} \ell^+ \ell^-) (q^2 > 16.0 \text{ GeV}^2/c^4)$** 

<u>VALUE (units <math>10^{-7}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>1.3 ± 0.4 OUR AVERAGE</b>			
1.25 ± 0.46	AAIJ	12AH LHCB	$pp$ at 7 TeV
1.57 ± 0.96 ± 0.17	AALTONEN	11AI CDF	$p\bar{p}$ at 1.96 TeV

 **$B(B^+ \rightarrow K^{*+} \ell^+ \ell^-) (1.0 < q^2 < 6.0 \text{ GeV}^2/c^4)$** 

<u>VALUE (units <math>10^{-7}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>1.8 ± 0.4 OUR AVERAGE</b>			
1.79 <sup>+0.41</sup> <sub>-0.37</sub> ± 0.13	<sup>1</sup> AAIJ	14M LHCB	$pp$ at 7, 8 TeV
2.57 ± 1.61 ± 0.40	AALTONEN	11AI CDF	$p\bar{p}$ at 1.96 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •			
2.90 <sup>+0.90</sup> <sub>-0.85</sub>	AAIJ	12AH LHCB	Repl. by AAIJ 14M

<sup>1</sup> Uses  $B(B^+ \rightarrow J/\psi(1S) K^*(892)^+) = (1.431 \pm 0.027 \pm 0.090) \times 10^{-3}$  for normalization and  $\mu^+ \mu^-$  as a lepton pair. Measured in  $1.1 < q^2 < 6.0 \text{ GeV}^2/c^4$ .

 **$B(B^+ \rightarrow K^{*+} \ell^+ \ell^-) (0.0 < q^2 < 4.3 \text{ GeV}^2/c^4)$** 

<u>VALUE (units <math>10^{-7}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>2.01 ± 1.39 ± 0.27</b>	AALTONEN	11AI CDF	$p\bar{p}$ at 1.96 TeV

 **$B(B^+ \rightarrow K^+ \ell^+ \ell^-) (q^2 < 2.0 \text{ GeV}^2/c^4)$** 

<u>VALUE (units <math>10^{-7}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.51 ± 0.08 OUR AVERAGE</b>	Error includes scale factor of 1.5.		
0.556 ± 0.053 ± 0.027	<sup>1</sup> AAIJ	13H LHCB	$pp$ at 7 TeV
0.36 ± 0.11 ± 0.03	AALTONEN	11AI CDF	$p\bar{p}$ at 1.96 TeV

<sup>1</sup> Measured in  $0.05 < q^2 < 2.0 \text{ GeV}^2/c^4$  range.

 **$B(B^+ \rightarrow K^+ \ell^+ \ell^-) (2.0 < q^2 < 4.3 \text{ GeV}^2/c^4)$** 

<u>VALUE (units <math>10^{-7}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.60 ± 0.07 OUR AVERAGE</b>	Error includes scale factor of 1.3.		
0.573 ± 0.053 ± 0.023	AAIJ	13H LHCB	$pp$ at 7 TeV
0.80 ± 0.15 ± 0.05	AALTONEN	11AI CDF	$p\bar{p}$ at 1.96 TeV

 **$B(B^+ \rightarrow K^+ \ell^+ \ell^-) (4.3 < q^2 < 8.68 \text{ GeV}^2/c^4)$** 

<u>VALUE (units <math>10^{-7}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>1.03 ± 0.07 OUR AVERAGE</b>			
1.003 ± 0.070 ± 0.039	AAIJ	13H LHCB	$pp$ at 7 TeV
1.18 ± 0.19 ± 0.09	AALTONEN	11AI CDF	$p\bar{p}$ at 1.96 TeV

 **$B(B^+ \rightarrow K^+ \ell^+ \ell^-) (10.09 < q^2 < 12.86 \text{ GeV}^2/c^4)$** 

<u>VALUE (units <math>10^{-7}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.58 ± 0.05 OUR AVERAGE</b>			
0.565 ± 0.050 ± 0.022	AAIJ	13H LHCB	$pp$ at 7 TeV
0.68 ± 0.12 ± 0.05	AALTONEN	11AI CDF	$p\bar{p}$ at 1.96 TeV

**$B(B^+ \rightarrow K^+ \ell^+ \ell^-)$  ( $14.18 < q^2 < 16.0 \text{ GeV}^2/c^4$ )**

<u>VALUE (units <math>10^{-7}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>0.40 \pm 0.05</math> OUR AVERAGE</b>	Error includes scale factor of 1.4.		
$0.377 \pm 0.036 \pm 0.015$	AAIJ	13H LHCb	$pp$ at 7 TeV
$0.53 \pm 0.10 \pm 0.03$	AALTONEN	11A CDF	$p\bar{p}$ at 1.96 TeV

**$B(B^+ \rightarrow K^+ \ell^+ \ell^-)$  ( $16.0 < q^2 < 18.0 \text{ GeV}^2/c^4$ )**

<u>VALUE (units <math>10^{-7}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>0.354 \pm 0.036 \pm 0.018</math></b>	AAIJ	13H LHCb	$pp$ at 7 TeV

**$B(B^+ \rightarrow K^+ \ell^+ \ell^-)$  ( $18.0 < q^2 < 22.0 \text{ GeV}^2/c^4$ )**

$F_H$  is a fractional contribution of (pseudo) scalar and tensor amplitudes to the decay width in the massless muon approximation.

<u>VALUE (units <math>10^{-7}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>0.312 \pm 0.040 \pm 0.016</math></b>	AAIJ	13H LHCb	$pp$ at 7 TeV

**$B(B^+ \rightarrow K^+ \ell^+ \ell^-)$  ( $15.0 < q^2 < 22.0 \text{ GeV}^2/c^4$ )**

<u>VALUE (units <math>10^{-7}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>0.85 \pm 0.03 \pm 0.04</math></b>	<sup>1</sup> AAIJ	14M LHCb	$pp$ at 7, 8 TeV

<sup>1</sup> Uses  $B(B^+ \rightarrow J/\psi(1S) K^+) = (0.998 \pm 0.014 \pm 0.040) \times 10^{-3}$  for normalization and  $\mu^+ \mu^-$  as a lepton pair.

**$B(B^+ \rightarrow K^+ \ell^+ \ell^-)$  ( $16.0 < q^2 \text{ GeV}^2/c^4$ )**

<u>VALUE (units <math>10^{-7}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>0.48 \pm 0.11 \pm 0.03</math></b>	AALTONEN	11A CDF	$p\bar{p}$ at 1.96 TeV

**$B(B^+ \rightarrow K^+ \ell^+ \ell^-)$  ( $1.0 < q^2 < 6.0 \text{ GeV}^2/c^4$ )**

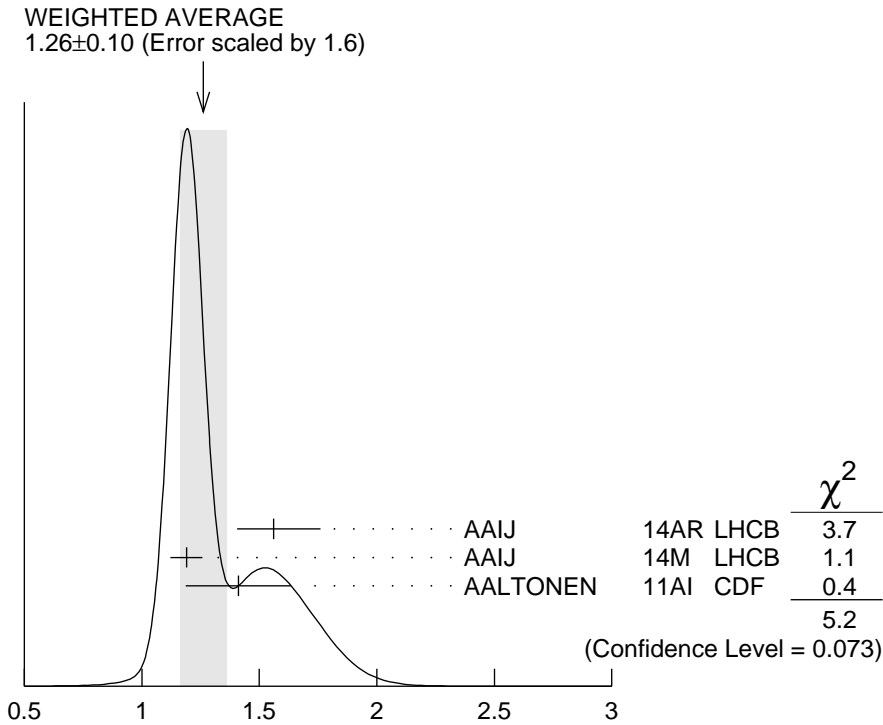
<u>VALUE (units <math>10^{-7}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>1.26 \pm 0.10</math> OUR AVERAGE</b>	Error includes scale factor of 1.6. See the ideogram below.		
$1.56 \begin{smallmatrix} +0.19 & +0.06 \\ -0.15 & -0.04 \end{smallmatrix}$	<sup>1</sup> AAIJ	14AR LHCb	$pp$ at 7, 8 TeV
$1.19 \pm 0.034 \pm 0.059$	<sup>2</sup> AAIJ	14M LHCb	$pp$ at 7, 8 TeV
$1.41 \pm 0.20 \pm 0.10$	AALTONEN	11A CDF	$p\bar{p}$ at 1.96 TeV

• • • We do not use the following data for averages, fits, limits, etc. • • •

$1.205 \pm 0.085 \pm 0.070$	AAIJ	13H LHCb	Repl. by AAIJ 14M
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<sup>1</sup> Measured by taking the ratio of the branching fraction from  $B^+ \rightarrow K^+ e^+ e^-$  and  $B^+ \rightarrow J/\psi(e^+ e^-) K^+$  decays and multiplying it by the measured value of  $B^+ \rightarrow J/\psi K^+$  and  $J/\psi \rightarrow e^+ e^-$  as in PDG 12 update. The branching fraction of  $B^+ \rightarrow K^+ e^+ e^-$  is determined in the region  $1 < q^2 < 6 \text{ GeV}^2/c^4$ .

<sup>2</sup> Uses  $B(B^+ \rightarrow J/\psi(1S) K^+) = (0.998 \pm 0.014 \pm 0.040) \times 10^{-3}$  for normalization and  $\mu^+ \mu^-$  for leptons. Measured for  $1.1 < q^2 < 6.0 \text{ GeV}^2/c^4$ .



$B(B^+ \rightarrow K^+ \ell^+ \ell^-)$  ( $1.0 < q^2 < 6.0 \text{ GeV}^2/c^4$ ) (units  $10^{-7}$ )

$B(B^+ \rightarrow K^+ \mu^+ \mu^-) / B(B^+ \rightarrow K^+ e^+ e^-)$  ( $1.0 < q^2 < 6.0 \text{ GeV}^2/c^4$ )

VALUE	DOCUMENT ID	TECN	COMMENT
$0.745^{+0.090}_{-0.074} \pm 0.036$	<sup>1</sup> AAIJ	14AR	LHCb $pp$ at 7, 8 TeV

<sup>1</sup> The ratio is determined using the ratio of the relative branching fractions of the decays  $B^+ \rightarrow K^+ \ell^+ \ell^-$  and  $B^+ \rightarrow J/\psi(\rightarrow \ell^+ \ell^-)K^+$ , with  $\ell = e, \mu$ .

$B(B^+ \rightarrow K^+ \ell^+ \ell^-)$  ( $0.0 < q^2 < 4.3 \text{ GeV}^2/c^4$ )

VALUE (units $10^{-7}$ )	DOCUMENT ID	TECN	COMMENT
$1.13 \pm 0.19 \pm 0.08$	AALTONEN	11A1	CDF $p\bar{p}$ at 1.96 TeV

$B(B^+ \rightarrow K^+ \pi^+ \pi^- \mu^+ \mu^-)$  ( $1.00 < q^2 < 6.00 \text{ GeV}^2/c^4$ )

VALUE (units $10^{-7}$ )	DOCUMENT ID	TECN	COMMENT
$1.38^{+0.15}_{-0.14} \pm 0.08$	AAIJ	14AZ	LHCb $pp$ at 7, 8 TeV

$B(B^+ \rightarrow K^+ \pi^+ \pi^- \mu^+ \mu^-)$  ( $0.10 < q^2 < 2.00 \text{ GeV}^2/c^4$ )

VALUE (units $10^{-7}$ )	DOCUMENT ID	TECN	COMMENT
$1.33^{+0.13}_{-0.12} \pm 0.09$	AAIJ	14AZ	LHCb $pp$ at 7, 8 TeV

$B(B^+ \rightarrow K^+ \pi^+ \pi^- \mu^+ \mu^-)$  ( $2.00 < q^2 < 4.30 \text{ GeV}^2/c^4$ )

VALUE (units $10^{-8}$ )	DOCUMENT ID	TECN	COMMENT
$5.38^{+0.94}_{-0.87} \pm 0.35$	AAIJ	14AZ	LHCb $pp$ at 7, 8 TeV

**$B(B^+ \rightarrow K^+ \pi^+ \pi^- \mu^+ \mu^-)$  ( $4.30 < q^2 < 8.68 \text{ GeV}^2/c^4$ )**

<u>VALUE (units <math>10^{-7}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$1.01^{+0.12}_{-0.13} \pm 0.09$	AAIJ	14AZ LHCb	$pp$ at 7, 8 TeV

 **$B(B^+ \rightarrow K^+ \pi^+ \pi^- \mu^+ \mu^-)$  ( $10.09 < q^2 < 12.86 \text{ GeV}^2/c^4$ )**

<u>VALUE (units <math>10^{-8}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$5.07^{+0.94}_{-0.89} \pm 0.47$	AAIJ	14AZ LHCb	$pp$ at 7, 8 TeV

 **$B(B^+ \rightarrow K^+ \pi^+ \pi^- \mu^+ \mu^-)$  ( $14.18 < q^2 < 19.00 \text{ GeV}^2/c^4$ )**

<u>VALUE (units <math>10^{-8}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$0.48^{+0.39}_{-0.29} \pm 0.05$	AAIJ	14AZ LHCb	$pp$ at 7, 8 TeV

 **$B(B^+ \rightarrow \pi^+ \mu^+ \mu^-)/B(B^+ \rightarrow K^+ \mu^+ \mu^-)$  ( $1.00 < q^2 < 6.00 \text{ GeV}^2/c^4$ )**

<u>VALUE (units <math>10^{-2}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$3.8 \pm 0.9 \pm 0.1$	AAIJ	15AR LHCb	$pp$ at 7, 8 TeV

 **$B(B^+ \rightarrow \pi^+ \mu^+ \mu^-)$  ( $1.00 < q^2 < 6.00 \text{ GeV}^2/c^4$ )**

<u>VALUE (units <math>10^{-9}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$4.55^{+1.05}_{-1.00} \pm 0.15$	AAIJ	15AR LHCb	$pp$ at 7, 8 TeV

 **$B(B^+ \rightarrow \pi^+ \mu^+ \mu^-)$  ( $15.00 < q^2 < 22.00 \text{ GeV}^2/c^4$ )**

<u>VALUE (units <math>10^{-9}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$3.29^{+0.84}_{-0.70} \pm 0.07$	AAIJ	15AR LHCb	$pp$ at 7, 8 TeV

 **$B(B^+ \rightarrow \pi^+ \mu^+ \mu^-)/B(B^+ \rightarrow K^+ \mu^+ \mu^-)$  ( $15.0 < q^2 < 22.0 \text{ GeV}^2/c^4$ )**

<u>VALUE (units <math>10^{-2}</math>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$3.7 \pm 0.8 \pm 0.1$	AAIJ	15AR LHCb	$pp$ at 7, 8 TeV

 **$A_{FB}(B^+ \rightarrow K^+ \mu^+ \mu^-)$  ( $1.1 < q^2 < 6.0 \text{ GeV}^2/c^4$ )**

$A_{FB}$  is the forward-backward angular asymmetry of the lepton pair in  $B \rightarrow K^{(*)} \ell^+ \ell^-$  decay as defined in  $B^+$ ,  $B^0$  admixture particle listings.

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$0.005 \pm 0.015 \pm 0.010$	<sup>1</sup> AAIJ	140 LHCb	$pp$ at 7,8 TeV

• • • We do not use the following data for averages, fits, limits, etc. • • •

$0.02^{+0.05}_{-0.03} \quad ^{+0.02}_{-0.01}$	AAIJ	13H LHCb	Repl. by AAIJ 140
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<sup>1</sup>AAIJ 140 reports 68% C.L. interval, which we encode as midpoint with uncertainty as half of the width of interval.

 **$A_{FB}(B^+ \rightarrow K^+ \mu^+ \mu^-)$  ( $15.0 < q^2 < 22.0 \text{ GeV}^2/c^4$ )**

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$-0.015 \pm 0.015 \pm 0.01$	<sup>1</sup> AAIJ	140 LHCb	$pp$ at 7, 8 TeV

<sup>1</sup>AAIJ 140 reports 68% C.L. interval, which we encode as midpoint with uncertainty as half of the width of interval.



### $F_H(B^+ \rightarrow K^+ \mu^+ \mu^-)$ ( $1.1 < q^2 < 6.0 \text{ GeV}^2/c^4$ )

$F_H$  is a fractional contribution of (pseudo) scalar and tensor amplitudes to the decay width in the massless muon approximation.

VALUE	DOCUMENT ID	TECN	COMMENT
$0.03 \pm 0.03 \pm 0.02$	<sup>1</sup> AAIJ	140	LHCB $pp$ at 7, 8 TeV

• • • We do not use the following data for averages, fits, limits, etc. • • •

$0.05^{+0.08+0.04}_{-0.05-0.02}$	AAIJ	13H	LHCB Repl. by AAIJ 140
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<sup>1</sup> AAIJ 140 reports 68% C.L. interval, which we encode as midpoint with uncertainty as half of the width of interval.

### $F_H(B^+ \rightarrow K^+ \mu^+ \mu^-)$ ( $15.0 < q^2 < 22.0 \text{ GeV}^2/c^4$ )

$F_H$  is a fractional contribution of (pseudo) scalar and tensor amplitudes to the decay width in the massless muon approximation.

VALUE	DOCUMENT ID	TECN	COMMENT
$0.035 \pm 0.035 \pm 0.02$	<sup>1</sup> AAIJ	140	LHCB $pp$ at 7, 8 TeV

<sup>1</sup> AAIJ 140 reports 68% C.L. interval, which we encode as midpoint with uncertainty as half of the width of interval.

## FORWARD-BACKWARD ASYMMETRIES

The forward-backward asymmetry is defined as  $A_{FB} = [N(q_{FB} > 0) - N(q_{FB} < 0)] / [N(q_{FB} > 0) + N(q_{FB} < 0)]$ , where  $q_{FB} = -q_B \cdot \text{sgn}(\eta_B)$  with  $q_B$  as the  $B$  hadron electric charge,  $\eta_B$  as its pseudorapidity, and  $\text{sgn}(\eta_B)$  as a sign function of  $\eta_B$ .

### $A_{FB}(B^\pm \rightarrow J/\psi K^\pm)$

VALUE (units $10^{-2}$ )	DOCUMENT ID	TECN	COMMENT
$-0.24 \pm 0.41 \pm 0.19$	ABAZOV	15	D0 $p\bar{p}$ at 1.96 TeV

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LEES	12Z	PR D86 091102	J.P. Lees <i>et al.</i>	(BABAR Collab.)
PDG	12	PR D86 010001	J. Beringer <i>et al.</i>	(PDG Collab.)
STYPULA	12	PR D86 072007	J. Stypula <i>et al.</i>	(BELLE Collab.)
AAIJ	11E	PR D84 092001	R. Aaij <i>et al.</i>	(LHCb Collab.)
Also		PR D85 039904 (errat.)	R. Aaij <i>et al.</i>	(LHCb Collab.)
AALTONEN	11	PRL 106 121804	T. Aaltonen <i>et al.</i>	(CDF Collab.)
AALTONEN	11AI	PRL 107 201802	T. Aaltonen <i>et al.</i>	(CDF Collab.)
AALTONEN	11AJ	PR D84 091504	T. Aaltonen <i>et al.</i>	(CDF Collab.)
AALTONEN	11B	PR D83 032008	T. Aaltonen <i>et al.</i>	(CDF Collab.)
AALTONEN	11L	PRL 106 161801	T. Aaltonen <i>et al.</i>	(CDF Collab.)
AUSHEV	11	PR D83 051102	T. Aushev <i>et al.</i>	(BELLE Collab.)
BHARDWAJ	11	PRL 107 091803	V. Bhardwaj <i>et al.</i>	(BELLE Collab.)
CHEN	11F	PR D84 071501	P. Chen <i>et al.</i>	(BELLE Collab.)

CHOI	11	PR D84 052004	S.-K. Choi <i>et al.</i>	(BELLE Collab.)
DEL-AMO-SA...	11B	PR D83 032004	P. del Amo Sanchez <i>et al.</i>	(BABAR Collab.)
DEL-AMO-SA...	11C	PR D83 032007	P. del Amo Sanchez <i>et al.</i>	(BABAR Collab.)
DEL-AMO-SA...	11D	PR D83 051101	P. del Amo Sanchez <i>et al.</i>	(BABAR Collab.)
DEL-AMO-SA...	11F	PR D83 052011	P. del Amo Sanchez <i>et al.</i>	(BABAR Collab.)
DEL-AMO-SA...	11K	PR D83 091101	P. del Amo Sanchez <i>et al.</i>	(BABAR Collab.)
DEL-AMO-SA...	11L	PRL 107 041804	P. del Amo Sanchez <i>et al.</i>	(BABAR Collab.)
GULER	11	PR D83 032005	H. Guler <i>et al.</i>	(BELLE Collab.)
HORII	11	PRL 106 231803	Y. Horii <i>et al.</i>	(BELLE Collab.)
LEES	11A	PR D84 012001	J.P. Lees <i>et al.</i>	(BABAR Collab.)
LEES	11D	PR D84 012002	J.P. Lees <i>et al.</i>	(BABAR Collab.)
LEES	11I	PR D84 092007	J.P. Lees <i>et al.</i>	(BABAR Collab.)
SAHOO	11A	PR D84 071101	H. Sahoo <i>et al.</i>	(BELLE Collab.)
SEON	11	PR D84 071106	O. Seon <i>et al.</i>	(BELLE Collab.)
VINOKUROVA	11	PL B706 139	A. Vinokurova <i>et al.</i>	(BELLE Collab.)
AALTONEN	10A	PR D81 031105	T. Aaltonen <i>et al.</i>	(CDF Collab.)
AUBERT	10	PRL 104 011802	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	10D	PR D81 052009	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	10E	PR D81 051101	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUSHEV	10	PR D81 031103	T. Aushev <i>et al.</i>	(BELLE Collab.)
BOZEK	10	PR D82 072005	A. BOZEK <i>et al.</i>	(BELLE Collab.)
DEL-AMO-SA...	10A	PR D82 011502	P. del Amo Sanchez <i>et al.</i>	(BABAR Collab.)
DEL-AMO-SA...	10B	PR D82 011101	P. del Amo Sanchez <i>et al.</i>	(BABAR Collab.)
DEL-AMO-SA...	10F	PRL 105 121801	P. del Amo Sanchez <i>et al.</i>	(BABAR Collab.)
DEL-AMO-SA...	10G	PR D82 072004	P. del Amo Sanchez <i>et al.</i>	(BABAR Collab.)
DEL-AMO-SA...	10H	PR D82 072006	P. del Amo Sanchez <i>et al.</i>	(BABAR Collab.)
DEL-AMO-SA...	10I	PR D82 091101	P. del Amo Sanchez <i>et al.</i>	(BABAR Collab.)
DEL-AMO-SA...	10K	PR D82 092006	P. del Amo Sanchez <i>et al.</i>	(BABAR Collab.)
DEL-AMO-SA...	10Q	PR D82 112002	P. del Amo Sanchez <i>et al.</i>	(BABAR Collab.)
HARA	10	PR D82 071101	K. Hara <i>et al.</i>	(BELLE Collab.)
LIBBY	10	PR D82 112006	J. Libby <i>et al.</i>	(CLEO Collab.)
POLUEKTOV	10	PR D81 112002	A. Poluektov <i>et al.</i>	(BELLE Collab.)
SAKAI	10	PR D82 091104	K. Sakai <i>et al.</i>	(BELLE Collab.)
WEDD	10	PR D81 111104	R. Wedd <i>et al.</i>	(BELLE Collab.)
AALTONEN	09B	PR D79 011104	T. Aaltonen <i>et al.</i>	(CDF Collab.)
ABAZOV	09Y	PR D79 111102	V.M. Abazov <i>et al.</i>	(D0 Collab.)
ABULENCIA	09	PR D79 112003	A. Abulencia <i>et al.</i>	(CDF Collab.)
AUBERT	09	PR D79 011102	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	09A	PR D79 012002	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	09AA	PR D79 112001	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	09AB	PR D79 112004	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	09AF	PR D80 051101	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	09AJ	PR D80 092001	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	09AO	PRL 103 211802	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	09AT	PR D80 111105	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	09AV	PR D80 112002	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	09B	PRL 102 132001	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	09F	PR D79 051102	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	09G	PRL 102 141802	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	09H	PR D79 052005	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	09J	PR D79 051101	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	09L	PR D79 072006	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	09Q	PR D79 052011	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	09S	PR D79 092002	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	09T	PRL 102 091803	B. Aubert <i>et al.</i>	(BABAR Collab.)
Also		EPAPS Document No. E-PRLTAO-102-060910		(BABAR Collab.)
AUBERT	09V	PR D79 091101	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	09Y	PRL 103 051803	B. Aubert <i>et al.</i>	(BABAR Collab.)
CHANG	09	PR D79 052006	Y.-W. Chang <i>et al.</i>	(BELLE Collab.)
CHEN	09C	PR D80 111103	P. Chen <i>et al.</i>	(BELLE Collab.)
LIU	09	PR D79 071102	C. Liu <i>et al.</i>	(BELLE Collab.)
WEI	09A	PRL 103 171801	J.-T. Wei <i>et al.</i>	(BELLE Collab.)
Also		EPAPS Supplement EPAPS_appendix.pdf		(BELLE Collab.)
WIECHCZYN...	09	PR D80 052005	J. Wiechczynski <i>et al.</i>	(BELLE Collab.)
ABAZOV	08O	PRL 100 211802	V.M. Abazov <i>et al.</i>	(D0 Collab.)
ADACHI	08	PR D77 091101	I. Adachi <i>et al.</i>	(BELLE Collab.)
AUBERT	08A	PR D77 011101	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	08AA	PR D77 111102	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	08AB	PR D78 012006	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	08AD	PR D77 091104	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	08AG	PR D78 011104	B. Aubert <i>et al.</i>	(BABAR Collab.)

AUBERT	08AH	PR D78 011107	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	08AI	PR D78 012004	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	08AL	PR D78 034023	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	08AT	PRL 100 231803	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	08AV	PRL 101 081801	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	08B	PR D77 011102	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	08BC	PR D78 072007	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	08BD	PR D78 091101	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	08BE	PR D78 091102	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	08BF	PR D78 092002	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	08BH	PR D78 112001	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	08BI	PRL 101 161801	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	08BK	PRL 101 201801	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	08BL	PRL 101 261802	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	08BN	PR D78 112003	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	08D	PR D77 011107	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	08F	PRL 100 051803	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	08G	PRL 100 171803	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	08H	PR D77 031101	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	08N	PRL 100 021801	B. Aubert <i>et al.</i>	(BABAR Collab.)
Also		PR D79 092002	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	08Q	PRL 100 151802	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	08W	PRL 101 082001	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	08X	PRL 101 091801	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	08Y	PR D77 111101	B. Aubert <i>et al.</i>	(BABAR Collab.)
BHARDWAJ	08	PR D78 051104	V. Bhardwaj <i>et al.</i>	(BELLE Collab.)
BRODZICKA	08	PRL 100 092001	J. Brodzicka <i>et al.</i>	(BELLE Collab.)
CHEN	08C	PRL 100 251801	J.-H. Chen <i>et al.</i>	(BELLE Collab.)
HORII	08	PR D78 071901	Y. Horii <i>et al.</i>	(BELLE Collab.)
IWABUCHI	08	PRL 101 041601	M. Iwabuchi <i>et al.</i>	(BELLE Collab.)
LIN	08	NAT 452 332	S.-W. Lin <i>et al.</i>	(BELLE Collab.)
LIVENTSEV	08	PR D77 091503	D. Liventsev <i>et al.</i>	(BELLE Collab.)
PDG	08	PL B667 1	C. Amsler <i>et al.</i>	(PDG Collab.)
TANIGUCHI	08	PRL 101 111801	N. Taniguchi <i>et al.</i>	(BELLE Collab.)
WEI	08	PL B659 80	J.-T. Wei <i>et al.</i>	(BELLE Collab.)
WEI	08A	PR D78 011101	J.-T. Wei <i>et al.</i>	(BELLE Collab.)
WICHT	08	PL B662 323	J. Wicht <i>et al.</i>	(BELLE Collab.)
ADAM	07	PRL 99 041802	N.E. Adam <i>et al.</i>	(CLEO Collab.)
Also		PR D76 012007	D.M. Asner <i>et al.</i>	(CLEO Collab.)
AUBERT	07AC	PR D76 031101	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	07AE	PR D76 031103	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	07AG	PRL 99 051801	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	07AL	PR D76 052002	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	07AN	PR D76 051101	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	07AR	PR D76 071103	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	07AV	PR D76 092004	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	07AZ	PRL 99 201801	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	07BA	PRL 99 201802	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	07BB	PRL 99 221801	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	07BC	PR D76 091102	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	07BI	PRL 99 241803	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	07BJ	PRL 99 251801	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	07BL	PRL 99 261801	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	07BN	PR D76 111101	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	07E	PRL 98 051802	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	07H	PR D75 031101	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	07L	PRL 98 151802	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	07M	PRL 98 171801	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	07N	PR D75 072002	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	07Q	PR D75 051102	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	07R	PRL 98 211804	B. Aubert <i>et al.</i>	(BABAR Collab.)
Also		PRL 100 189903E	B. Aubert <i>et al.</i>	(BABAR Collab.)
Also		PRL 100 199905E	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	07X	PR D75 091103	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	07Z	PR D76 011103	B. Aubert <i>et al.</i>	(BABAR Collab.)
CHANG	07B	PR D75 071104	P. Chang <i>et al.</i>	(BELLE Collab.)
CHEN	07D	PRL 99 221802	K.-F. Chen <i>et al.</i>	(BELLE Collab.)
HOKUUE	07	PL B648 139	T. Hokuue <i>et al.</i>	(BELLE Collab.)
LIN	07	PRL 98 181804	S.-W. Lin <i>et al.</i>	(BELLE Collab.)
LIN	07A	PRL 99 121601	S.-W. Lin <i>et al.</i>	(BELLE Collab.)
SATOYAMA	07	PL B647 67	N. Satoyama <i>et al.</i>	(BELLE Collab.)

SCHUEMANN	07	PR D75 092002	J. Schuemann <i>et al.</i>	(BELLE Collab.)
TSAI	07	PR D75 111101	Y.-T. Tsai <i>et al.</i>	(BELLE Collab.)
URQUIJO	07	PR D75 032001	P. Urquijo <i>et al.</i>	(BELLE Collab.)
WANG	07B	PR D75 092005	C.H. Wang <i>et al.</i>	(BELLE Collab.)
WANG	07C	PR D76 052004	M.-Z. Wang <i>et al.</i>	(BELLE Collab.)
XIE	07	PR D75 017101	Q.L. Xie <i>et al.</i>	(BELLE Collab.)
ABE	06	PR D73 051106	K. Abe <i>et al.</i>	(BELLE Collab.)
ABULENCIA	06J	PRL 96 191801	A. Abulencia <i>et al.</i>	(CDF Collab.)
ACOSTA	06	PRL 96 202001	D. Acosta <i>et al.</i>	(CDF Collab.)
AUBERT	06	PR D73 011101	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	06E	PRL 96 052002	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	06F	PR D73 011103	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	06J	PR D73 051105	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	06K	PR D73 057101	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	06N	PR D74 031103	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	06O	PR D74 032003	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	06Z	PR D73 111104	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,B	06A	PR D73 112004	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,B	06C	PR D74 011102	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,B	06E	PR D74 011106	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,B	06G	PRL 97 201801	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,B	06H	PRL 97 201802	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,B	06J	PR D73 092001	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,B	06M	PR D74 031102	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,B	06P	PR D74 031105	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,B	06T	PR D74 051102	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,B	06U	PR D74 051104	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,B	06Y	PR D74 091105	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,BE	06A	PR D74 099903 (err.)	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,BE	06C	PRL 97 171805	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,BE	06G	PRL 97 261801	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,BE	06H	PRL 97 261803	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,BE	06J	PR D74 111102	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,BE	06M	PR D74 071101	B. Aubert <i>et al.</i>	(BABAR Collab.)
CHISTOV	06A	PR D74 111105	R. Chistov <i>et al.</i>	(BELLE Collab.)
FANG	06	PR D74 012007	F. Fang <i>et al.</i>	(BELLE Collab.)
GABYSHEV	06	PRL 97 202003	N. Gabyshev <i>et al.</i>	(BELLE Collab.)
GABYSHEV	06A	PRL 97 242001	N. Gabyshev <i>et al.</i>	(BELLE Collab.)
GARMASH	06	PRL 96 251803	A. Garmash <i>et al.</i>	(BELLE Collab.)
GOKHROO	06	PRL 97 162002	G. Gokhroo <i>et al.</i>	(BELLE Collab.)
IKADO	06	PRL 97 251802	K. Ikado <i>et al.</i>	(BELLE Collab.)
JEN	06	PR D74 111101	C.-M. Jen <i>et al.</i>	(BELLE Collab.)
KUMAR	06	PR D74 051103	R. Kumar <i>et al.</i>	(BELLE Collab.)
MOHAPATRA	06	PRL 96 221601	D. Mohapatra <i>et al.</i>	(BELLE Collab.)
POLUEKTOV	06	PR D73 112009	A. Poluektov <i>et al.</i>	(BELLE Collab.)
SCHUEMANN	06	PRL 97 061802	J. Schuemann <i>et al.</i>	(BELLE Collab.)
SONI	06	PL B634 155	N. Soni <i>et al.</i>	(BELLE Collab.)
ABE	05A	PRL 94 221805	K. Abe <i>et al.</i>	(BELLE Collab.)
ABE	05B	PR D71 072003	K. Abe <i>et al.</i>	(BELLE Collab.)
Also		PR D71 079903 (err.)	K. Abe <i>et al.</i>	(BELLE Collab.)
ABE	05G	PRL 95 231802	K. Abe <i>et al.</i>	(BELLE Collab.)
ACOSTA	05J	PRL 95 031801	D. Acosta <i>et al.</i>	(CDF Collab.)
AUBERT	05	PRL 94 011801	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	05B	PR D71 031501	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	05G	PR D72 032004	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	05H	PRL 94 101801	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	05J	PRL 94 141801	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	05K	PRL 94 171801	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	05L	PRL 94 181802	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	05M	PRL 94 191802	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	05N	PR D71 031102	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	05O	PR D71 031103	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	05R	PR D71 071103	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	05U	PR D71 091103	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	05X	PR D71 111101	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,B	05B	PRL 95 041804	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,B	05E	PR D72 011102	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,B	05G	PR D72 052002	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,B	05K	PRL 95 131803	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,B	05L	PR D72 051101	B. Aubert <i>et al.</i>	(BABAR Collab.)

AUBERT,B	05N	PR D72 072003	B. Aubert <i>et al.</i>	(BABAR Collab.)
Also		PR D74 099903 (errata.)	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,B	05O	PR D72 051102	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,B	05T	PR D72 071102	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,B	05U	PR D72 071103	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,B	05V	PR D72 071104	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,B	05Y	PRL 95 121802	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,BE	05E	PRL 95 221801	B. Aubert <i>et al.</i>	(BABAR Collab.)
CHANG	05	PR D71 072007	M.-C. Chang <i>et al.</i>	(BELLE Collab.)
CHANG	05A	PR D71 091106	P. Chang <i>et al.</i>	(BELLE Collab.)
CHAO	05A	PR D71 031502	Y. Chao <i>et al.</i>	(BELLE Collab.)
CHEN	05A	PRL 94 221804	K.-F. Chen <i>et al.</i>	(BELLE Collab.)
GARMASH	05	PR D71 092003	A. Garmash <i>et al.</i>	(BELLE Collab.)
ITOH	05	PRL 95 091601	R. Itoh <i>et al.</i>	(BELLE Collab.)
LEE	05	PRL 95 061802	Y.-J. Lee <i>et al.</i>	(BELLE Collab.)
LIVENTSEV	05	PR D72 051109	D. Liventsev <i>et al.</i>	(BELLE Collab.)
MAJUMDER	05	PRL 95 041803	G. Majumder <i>et al.</i>	(BELLE Collab.)
MOHAPATRA	05	PR D72 011101	D. Mohapatra <i>et al.</i>	(BELLE Collab.)
NISHIDA	05	PL B610 23	S. Nishida <i>et al.</i>	(BELLE Collab.)
OKABE	05	PL B614 27	T. Okabe <i>et al.</i>	(BELLE Collab.)
SAIGO	05	PRL 94 091601	M. Saigo <i>et al.</i>	(BELLE Collab.)
WANG	05A	PL B617 141	M.-Z. Wang <i>et al.</i>	(BELLE Collab.)
XIE	05	PR D72 051105	Q.L. Xie <i>et al.</i>	(BELLE Collab.)
YANG	05	PRL 94 111802	H. Yang <i>et al.</i>	(BELLE Collab.)
ZHANG	05A	PRL 94 031801	J. Zhang <i>et al.</i>	(BELLE Collab.)
ZHANG	05B	PR D71 091107	L.M. Zhang <i>et al.</i>	(BELLE Collab.)
ZHANG	05D	PRL 95 141801	J. Zhang <i>et al.</i>	(BELLE Collab.)
ABDALLAH	04E	EPJ C33 307	J. Abdallah <i>et al.</i>	(DELPHI Collab.)
ABE	04D	PR D69 112002	K. Abe <i>et al.</i>	(BELLE Collab.)
AUBERT	04A	PR D69 011102	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	04C	PRL 92 111801	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	04H	PRL 92 061801	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	04K	PRL 92 141801	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	04M	PRL 92 201802	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	04N	PRL 92 202002	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	04O	PRL 92 221803	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	04P	PRL 92 241802	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	04Q	PR D69 051101	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	04T	PR D69 071103	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	04Y	PRL 93 041801	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	04Z	PRL 93 051802	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,B	04B	PR D70 011101	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,B	04D	PR D70 032006	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,B	04L	PRL 93 131804	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,B	04P	PR D70 092001	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,B	04S	PRL 93 181801	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,B	04U	PR D70 091105	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,B	04V	PRL 93 181805	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,BE	04	PR D70 111102	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,BE	04A	PR D70 112006	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,BE	04B	PR D70 091106	B. Aubert <i>et al.</i>	(BABAR Collab.)
CHAO	04	PR D69 111102	Y. Chao <i>et al.</i>	(BELLE Collab.)
CHAO	04B	PRL 93 191802	Y. Chao <i>et al.</i>	(BELLE Collab.)
CHISTOV	04	PRL 93 051803	R. Chistov <i>et al.</i>	(BELLE Collab.)
DRUTSKOY	04	PRL 92 051801	A. Drutskoy <i>et al.</i>	(BELLE Collab.)
GARMASH	04	PR D69 012001	A. Garmash <i>et al.</i>	(BELLE Collab.)
LEE	04	PRL 93 211801	Y.-J. Lee <i>et al.</i>	(BELLE Collab.)
MAJUMDER	04	PR D70 111103	G. Majumder <i>et al.</i>	(BELLE Collab.)
NAKAO	04	PR D69 112001	M. Nakao <i>et al.</i>	(BELLE Collab.)
POLUEKTOV	04	PR D70 072003	A. Poluektov <i>et al.</i>	(BELLE Collab.)
SCHWANDA	04	PRL 93 131803	C. Schwanda <i>et al.</i>	(BELLE Collab.)
WANG	04	PRL 92 131801	M.Z. Wang <i>et al.</i>	(BELLE Collab.)
WANG	04A	PR D70 012001	C.H. Wang <i>et al.</i>	(BELLE Collab.)
ZANG	04	PR D69 017101	S.L. Zang <i>et al.</i>	(BELLE Collab.)
ABE	03B	PR D67 032003	K. Abe <i>et al.</i>	(BELLE Collab.)
ABE	03D	PRL 90 131803	K. Abe <i>et al.</i>	(BELLE Collab.)
ADAM	03	PR D67 032001	N.E. Adam <i>et al.</i>	(CLEO Collab.)
ADAM	03B	PR D68 012004	N.E. Adam <i>et al.</i>	(CLEO Collab.)
ATHAR	03	PR D68 072003	S.B. Athar <i>et al.</i>	(CLEO Collab.)
AUBERT	03K	PRL 90 231801	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	03L	PRL 91 021801	B. Aubert <i>et al.</i>	(BABAR Collab.)

AUBERT	03M	PRL 91 051801	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	03O	PRL 91 071801	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	03U	PRL 91 221802	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	03V	PRL 91 171802	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	03W	PRL 91 161801	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	03X	PR D68 092001	B. Aubert <i>et al.</i>	(BABAR Collab.)
BORNHEIM	03	PR D68 052002	A. Bornheim <i>et al.</i>	(CLEO Collab.)
CHEN	03B	PRL 91 201801	K.-F. Chen <i>et al.</i>	(BELLE Collab.)
CHOI	03	PRL 91 262001	S.-K. Choi <i>et al.</i>	(BELLE Collab.)
CSORNA	03	PR D67 112002	S.E. Csorna <i>et al.</i>	(CLEO Collab.)
EDWARDS	03	PR D68 011102	K.W. Edwards <i>et al.</i>	(CLEO Collab.)
FANG	03	PRL 90 071801	F. Fang <i>et al.</i>	(BELLE Collab.)
HUANG	03	PRL 91 241802	H.-C. Huang <i>et al.</i>	(BELLE Collab.)
ISHIKAWA	03	PRL 91 261601	A. Ishikawa <i>et al.</i>	(BELLE Collab.)
KROKOVNY	03B	PRL 91 262002	P. Krokovny <i>et al.</i>	(BELLE Collab.)
SWAIN	03	PR D68 051101	S.K. Swain <i>et al.</i>	(BELLE Collab.)
UNNO	03	PR D68 011103	Y. Unno <i>et al.</i>	(BELLE Collab.)
ZHANG	03B	PRL 91 221801	J. Zhang <i>et al.</i>	(BELLE Collab.)
ABE	02	PRL 88 021801	K. Abe <i>et al.</i>	(BELLE Collab.)
ABE	02B	PRL 88 031802	K. Abe <i>et al.</i>	(BELLE Collab.)
ABE	02H	PRL 88 171801	K. Abe <i>et al.</i>	(BELLE Collab.)
ABE	02K	PRL 88 181803	K. Abe <i>et al.</i>	(BELLE Collab.)
ABE	02N	PL B538 11	K. Abe <i>et al.</i>	(BELLE Collab.)
ABE	02O	PR D65 091103	K. Abe <i>et al.</i>	(BELLE Collab.)
ABE	02W	PRL 89 151802	K. Abe <i>et al.</i>	(BELLE Collab.)
ACOSTA	02C	PR D65 092009	D. Acosta <i>et al.</i>	(CDF Collab.)
ACOSTA	02F	PR D66 052005	D. Acosta <i>et al.</i>	(CDF Collab.)
AHMED	02B	PR D66 031101	S. Ahmed <i>et al.</i>	(CLEO Collab.)
AUBERT	02	PR D65 032001	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	02C	PRL 88 101805	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	02E	PR D65 051101	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	02F	PR D65 091101	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	02L	PRL 88 241801	B. Aubert <i>et al.</i>	(BABAR Collab.)
BRIERE	02	PRL 89 081803	R. Briere <i>et al.</i>	(CLEO Collab.)
CASEY	02	PR D66 092002	B.C.K. Casey <i>et al.</i>	(BELLE Collab.)
CHEN	02B	PL B546 196	K.-F. Chen <i>et al.</i>	(BELLE Collab.)
DRUTSKOY	02	PL B542 171	A. Drutskoy <i>et al.</i>	(BELLE Collab.)
DYTMAN	02	PR D66 091101	S.A. Dytman <i>et al.</i>	(CLEO Collab.)
ECKHART	02	PRL 89 251801	E. Eckhart <i>et al.</i>	(CLEO Collab.)
EDWARDS	02B	PR D65 111102	K.W. Edwards <i>et al.</i>	(CLEO Collab.)
GABYSHEV	02	PR D66 091102	N. Gabyshev <i>et al.</i>	(BELLE Collab.)
GARMASH	02	PR D65 092005	A. Garmash <i>et al.</i>	(BELLE Collab.)
GODANG	02	PRL 88 021802	R. Godang <i>et al.</i>	(CLEO Collab.)
GORDON	02	PL B542 183	A. Gordon <i>et al.</i>	(BELLE Collab.)
LU	02	PRL 89 191801	R.-S. Lu <i>et al.</i>	(BELLE Collab.)
MAHAPATRA	02	PRL 88 101803	R. Mahapatra <i>et al.</i>	(CLEO Collab.)
NISHIDA	02	PRL 89 231801	S. Nishida <i>et al.</i>	(BELLE Collab.)
ABE	01H	PRL 87 101801	K. Abe <i>et al.</i>	(BELLE Collab.)
ABE	01I	PRL 87 111801	K. Abe <i>et al.</i>	(BELLE Collab.)
ABE	01K	PR D64 071101	K. Abe <i>et al.</i>	(BELLE Collab.)
ABE	01L	PRL 87 161601	K. Abe <i>et al.</i>	(BELLE Collab.)
ABE	01M	PL B517 309	K. Abe <i>et al.</i>	(BELLE Collab.)
ALEXANDER	01B	PR D64 092001	J.P. Alexander <i>et al.</i>	(CLEO Collab.)
AMMAR	01B	PRL 87 271801	R. Ammar <i>et al.</i>	(CLEO Collab.)
ANDERSON	01B	PRL 87 181803	S. Anderson <i>et al.</i>	(CLEO Collab.)
AUBERT	01D	PRL 87 151801	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	01E	PRL 87 151802	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	01F	PRL 87 201803	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	01G	PRL 87 221802	B. Aubert <i>et al.</i>	(BABAR Collab.)
BARATE	01E	EPJ C19 213	R. Barate <i>et al.</i>	(ALEPH Collab.)
BRIERE	01	PRL 86 3718	R.A. Biere <i>et al.</i>	(CLEO Collab.)
BROWDER	01	PRL 86 2950	T.E. Browder <i>et al.</i>	(CLEO Collab.)
EDWARDS	01	PRL 86 30	K.W. Edwards <i>et al.</i>	(CLEO Collab.)
GRITSAN	01	PR D64 077501	A. Gritsan <i>et al.</i>	(CLEO Collab.)
RICHICHI	01	PR D63 031103	S.J. Richichi <i>et al.</i>	(CLEO Collab.)
ABBIENDI	00B	PL B476 233	G. Abbiendi <i>et al.</i>	(OPAL Collab.)
ABE	00C	PR D62 071101	K. Abe <i>et al.</i>	(SLD Collab.)
AHMED	00B	PR D62 112003	S. Ahmed <i>et al.</i>	(CLEO Collab.)
ANASTASSOV	00	PRL 84 1393	A. Anastassov <i>et al.</i>	(CLEO Collab.)
BARATE	00R	PL B492 275	R. Barate <i>et al.</i>	(ALEPH Collab.)
BEHRENS	00	PR D61 052001	B.H. Behrens <i>et al.</i>	(CLEO Collab.)

BONVICINI	00	PRL 84 5940	G. Bonvicini <i>et al.</i>	(CLEO Collab.)
CHEN	00	PRL 85 525	S. Chen <i>et al.</i>	(CLEO Collab.)
COAN	00	PRL 84 5283	T.E. Coan <i>et al.</i>	(CLEO Collab.)
CRONIN-HEN...	00	PRL 85 515	D. Cronin-Hennessy <i>et al.</i>	(CLEO Collab.)
CSORNA	00	PR D61 111101	S.E. Csorna <i>et al.</i>	(CLEO Collab.)
JESSOP	00	PRL 85 2881	C.P. Jessop <i>et al.</i>	(CLEO Collab.)
RICHICHI	00	PRL 85 520	S.J. Richichi <i>et al.</i>	(CLEO Collab.)
ABBIENDI	99J	EPJ C12 609	G. Abbiendi <i>et al.</i>	(OPAL Collab.)
AFFOLDER	99B	PRL 83 3378	T. Affolder <i>et al.</i>	(CDF Collab.)
BARTELT	99	PRL 82 3746	J. Bartelt <i>et al.</i>	(CLEO Collab.)
COAN	99	PR D59 111101	T.E. Coan <i>et al.</i>	(CLEO Collab.)
ABE	98B	PR D57 5382	F. Abe <i>et al.</i>	(CDF Collab.)
ABE	98O	PR D58 072001	F. Abe <i>et al.</i>	(CDF Collab.)
ABE	98Q	PR D58 092002	F. Abe <i>et al.</i>	(CDF Collab.)
ACCIARRI	98S	PL B438 417	M. Acciarri <i>et al.</i>	(L3 Collab.)
ANASTASSOV	98	PRL 80 4127	A. Anastassov <i>et al.</i>	(CLEO Collab.)
ATHANAS	98	PRL 80 5493	M. Athanas <i>et al.</i>	(CLEO Collab.)
BARATE	98Q	EPJ C4 387	R. Barate <i>et al.</i>	(ALEPH Collab.)
BEHRENS	98	PRL 80 3710	B.H. Behrens <i>et al.</i>	(CLEO Collab.)
BERGFELD	98	PRL 81 272	T. Bergfeld <i>et al.</i>	(CLEO Collab.)
BRANDENB...	98	PRL 80 2762	G. Brandenbrug <i>et al.</i>	(CLEO Collab.)
CAPRINI	98	NP B530 153	I. Caprini, L. Lellouch, M. Neubert	(BCIP, CERN)
GODANG	98	PRL 80 3456	R. Godang <i>et al.</i>	(CLEO Collab.)
ABE	97J	PRL 79 590	K. Abe <i>et al.</i>	(SLD Collab.)
ACCIARRI	97F	PL B396 327	M. Acciarri <i>et al.</i>	(L3 Collab.)
ARTUSO	97	PL B399 321	M. Artuso <i>et al.</i>	(CLEO Collab.)
ATHANAS	97	PRL 79 2208	M. Athanas <i>et al.</i>	(CLEO Collab.)
BROWDER	97	PR D56 11	T. Browder <i>et al.</i>	(CLEO Collab.)
FU	97	PRL 79 3125	X. Fu <i>et al.</i>	(CLEO Collab.)
JESSOP	97	PRL 79 4533	C.P. Jessop <i>et al.</i>	(CLEO Collab.)
ABE	96B	PR D53 3496	F. Abe <i>et al.</i>	(CDF Collab.)
ABE	96C	PRL 76 4462	F. Abe <i>et al.</i>	(CDF Collab.)
ABE	96H	PRL 76 2015	F. Abe <i>et al.</i>	(CDF Collab.)
ABE	96L	PRL 76 4675	F. Abe <i>et al.</i>	(CDF Collab.)
ABE	96Q	PR D54 6596	F. Abe <i>et al.</i>	(CDF Collab.)
ABE	96R	PRL 77 5176	F. Abe <i>et al.</i>	(CDF Collab.)
ADAM	96D	ZPHY C72 207	W. Adam <i>et al.</i>	(DELPHI Collab.)
ALEXANDER	96T	PRL 77 5000	J.P. Alexander <i>et al.</i>	(CLEO Collab.)
ASNER	96	PR D53 1039	D.M. Asner <i>et al.</i>	(CLEO Collab.)
BARISH	96B	PRL 76 1570	B.C. Barish <i>et al.</i>	(CLEO Collab.)
BERGFELD	96B	PRL 77 4503	T. Bergfeld <i>et al.</i>	(CLEO Collab.)
BISHAI	96	PL B369 186	M. Bishai <i>et al.</i>	(CLEO Collab.)
BUSKULIC	96J	ZPHY C71 31	D. Buskulic <i>et al.</i>	(ALEPH Collab.)
GIBAUT	96	PR D53 4734	D. Gibaut <i>et al.</i>	(CLEO Collab.)
PDG	96	PR D54 1	R. M. Barnett <i>et al.</i>	(PDG Collab.)
ABREU	95N	PL B357 255	P. Abreu <i>et al.</i>	(DELPHI Collab.)
ABREU	95Q	ZPHY C68 13	P. Abreu <i>et al.</i>	(DELPHI Collab.)
ADAM	95	ZPHY C68 363	W. Adam <i>et al.</i>	(DELPHI Collab.)
AKERS	95T	ZPHY C67 379	R. Akers <i>et al.</i>	(OPAL Collab.)
ALBRECHT	95D	PL B353 554	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
ALEXANDER	95	PL B341 435	J. Alexander <i>et al.</i>	(CLEO Collab.)
Also		PL B347 469 (erratum)	J. Alexander <i>et al.</i>	(CLEO Collab.)
ARTUSO	95	PRL 75 785	M. Artuso <i>et al.</i>	(CLEO Collab.)
BARISH	95	PR D51 1014	B.C. Barish <i>et al.</i>	(CLEO Collab.)
BUSKULIC	95	PL B343 444	D. Buskulic <i>et al.</i>	(ALEPH Collab.)
ABE	94D	PRL 72 3456	F. Abe <i>et al.</i>	(CDF Collab.)
ALAM	94	PR D50 43	M.S. Alam <i>et al.</i>	(CLEO Collab.)
ALBRECHT	94D	PL B335 526	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
ATHANAS	94	PRL 73 3503	M. Athanas <i>et al.</i>	(CLEO Collab.)
Also		PRL 74 3090 (erratum)	M. Athanas <i>et al.</i>	(CLEO Collab.)
PDG	94	PR D50 1173	L. Montanet <i>et al.</i>	(CERN, LBL, BOST+)
STONE	94	HEPSY 93-11	S. Stone	
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ABREU	93D	ZPHY C57 181	P. Abreu <i>et al.</i>	(DELPHI Collab.)
ABREU	93G	PL B312 253	P. Abreu <i>et al.</i>	(DELPHI Collab.)
ACTON	93C	PL B307 247	P.D. Acton <i>et al.</i>	(OPAL Collab.)
ALBRECHT	93E	ZPHY C60 11	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
ALEXANDER	93B	PL B319 365	J. Alexander <i>et al.</i>	(CLEO Collab.)
AMMAR	93	PRL 71 674	R. Ammar <i>et al.</i>	(CLEO Collab.)
BEAN	93B	PRL 70 2681	A. Bean <i>et al.</i>	(CLEO Collab.)



BUSKULIC	93D	PL B307 194	D. Buskulic <i>et al.</i>	(ALEPH Collab.)
Also		PL B325 537 (erratum)	D. Buskulic <i>et al.</i>	(ALEPH Collab.)
SANGHERA	93	PR D47 791	S. Sanghera <i>et al.</i>	(CLEO Collab.)
ALBRECHT	92C	PL B275 195	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
ALBRECHT	92E	PL B277 209	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
ALBRECHT	92G	ZPHY C54 1	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
BORTOLETTO	92	PR D45 21	D. Bortoletto <i>et al.</i>	(CLEO Collab.)
BUSKULIC	92G	PL B295 396	D. Buskulic <i>et al.</i>	(ALEPH Collab.)
ALBRECHT	91B	PL B254 288	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
ALBRECHT	91C	PL B255 297	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
ALBRECHT	91E	PL B262 148	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
BERKELMAN	91	ARNPS 41 1	K. Berkelman, S. Stone	(CORN, SYRA)
"Decays of <i>B</i> Mesons"				
FULTON	91	PR D43 651	R. Fulton <i>et al.</i>	(CLEO Collab.)
ALBRECHT	90B	PL B241 278	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
ALBRECHT	90J	ZPHY C48 543	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
ANTREASYAN	90B	ZPHY C48 553	D. Antreasyan <i>et al.</i>	(Crystal Ball Collab.)
BORTOLETTO	90	PRL 64 2117	D. Bortoletto <i>et al.</i>	(CLEO Collab.)
Also		PR D45 21	D. Bortoletto <i>et al.</i>	(CLEO Collab.)
WEIR	90B	PR D41 1384	A.J. Weir <i>et al.</i>	(Mark II Collab.)
ALBRECHT	89G	PL B229 304	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
AVERY	89B	PL B223 470	P. Avery <i>et al.</i>	(CLEO Collab.)
BEBEK	89	PRL 62 8	C. Bebek <i>et al.</i>	(CLEO Collab.)
BORTOLETTO	89	PRL 62 2436	D. Bortoletto <i>et al.</i>	(CLEO Collab.)
ALBRECHT	88F	PL B209 119	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
ALBRECHT	88K	PL B215 424	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
ALBRECHT	87C	PL B185 218	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
ALBRECHT	87D	PL B199 451	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
AVERY	87	PL B183 429	P. Avery <i>et al.</i>	(CLEO Collab.)
BEBEK	87	PR D36 1289	C. Bebek <i>et al.</i>	(CLEO Collab.)
ALAM	86	PR D34 3279	M.S. Alam <i>et al.</i>	(CLEO Collab.)
PDG	86	PL 170B 1	M. Aguilar-Benitez <i>et al.</i>	(CERN, CIT+)
GILES	84	PR D30 2279	R. Giles <i>et al.</i>	(CLEO Collab.)