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

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 AD-MIXTURE sections.

See the Note "Production and Decay of *b*-flavored Hadrons" at the beginning of the B^{\pm} Particle Listings and the Note on " $B^0-\overline{B}^0$ Mixing" near the end of the B^0 Particle Listings.

B⁰ 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	
5279.4±0.5 OUR FI	Г				
5279.3±0.7 OUR AV	ERAGE				
$5279.1 \pm 0.7 \pm 0.3$	135	¹ CSORNA	00 CLE2	2 $e^+e^- \rightarrow \Upsilon(4S)$	
$5281.3 \pm 2.2 \pm 1.4$	51	ABE	96b CDF	<i>р<mark>р</mark> at 1.</i> 8 ТеV	
$\bullet \bullet \bullet$ We do not use t	he following	g data for average	s, fits, limit	s, etc. ● ● ●	
$5279.2\!\pm\!0.54\!\pm\!2.0$	340	ALAM	94 CLE2	$e^+e^- \rightarrow \Upsilon(4S)$	
$5278.0 \pm 0.4 \pm 2.0$		BORTOLETT	092 CLE	O $e^+e^- \rightarrow \Upsilon(4S)$	
$5279.6 {\pm} 0.7 {\pm} 2.0$	40	² ALBRECHT	90J ARG	$e^+e^- \rightarrow \Upsilon(4S)$	
$5278.2 \pm 1.0 \pm 3.0$	40	ALBRECHT	87c ARG	$e^+e^- ightarrow ~\Upsilon(4S)$	
$5279.5 \pm 1.6 \pm 3.0$	7	³ ALBRECHT	87d ARG	$e^+e^- ightarrow ~\Upsilon(4S)$	
$5280.6 \!\pm\! 0.8 \ \pm 2.0$		BEBEK	87 CLE	$e^+e^- \rightarrow \Upsilon(4S)$	
1		- 0	(')		

¹CSORNA 00 uses fully reconstructed 135 $B^0 \rightarrow J/\psi^{(')} K^0_S$ events and invariant masses without beam constraint. 2 ALBRECHT 90J assumes 10580 for $\Upsilon(4S)$ mass. Supersedes ALBRECHT 87C and

ALBRECHT 87D.

³Found using fully reconstructed decays with J/ψ . ALBRECHT 87D assume $m \gamma(4S) =$ 10577 MeV.

$m_{B^0} - m_{B^+}$

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT		
0.33±0.28 OUR FIT Error	includes scale factor of 1.	1.			
0.34 ± 0.32 OUR AVERAGE	Error includes scale facto	or of 1.2.			
$0.41\!\pm\!0.25\!\pm\!0.19$	ALAM 94	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$	
$-0.4 \ \pm 0.6 \ \pm 0.5$	BORTOLETTO92	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$	
$-0.9 \ \pm 1.2 \ \pm 0.5$	ALBRECHT 90J	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$	
$2.0 \ \pm 1.1 \ \pm 0.3$	⁴ BEBEK 87	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$	
⁴ BEBEK 87 actually measure the difference between half of $E_{\rm cm}$ and the B^{\pm} or B^0 mass, so the $m_{B^0} - m_{B^{\pm}}$ is more accurate. Assume $m_{\Upsilon(4S)} = 10580$ MeV.					

$$m_{B_H^0} - m_{B_L^0}$$

See the $B^0 - \overline{B}^0$ MIXING PARAMETERS section near the end of these B^0 Listings.

B⁰ MEAN LIFE

See $B^{\pm}/B^0/B^0_s/b$ -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 corrections between the measurements and asymmetric lifetime errors.

VALUE (10^{-12} s)	EVTS	DOCUMENT ID	TECN	COMMENT
1.532 ± 0.009 OUR EVA	LUATIO	N		
$1.473^{+0.052}_{-0.050}{\pm}0.023$		⁵ ABAZOV	05b D0	<i>р</i> <u>р</u> at 1.96 ТеV
$1.40 \begin{array}{c} +0.11 \\ -0.10 \end{array} \pm 0.03$		⁶ ABAZOV	05c D0	<i>р</i> р _р ат 1.96 ТеV
$1.534 \!\pm\! 0.008 \!\pm\! 0.010$		⁷ ABE	05b BELL	$e^+ e^- ightarrow ~ \Upsilon(4S)$
$1.54\ \pm 0.05\ \pm 0.02$		⁸ ACOSTA	05 CDF	<i>р р</i> ат 1.96 ТеV
$1.531\!\pm\!0.021\!\pm\!0.031$		⁹ ABDALLAH	04e DLPH	$e^+e^- \rightarrow Z$
$1.523^{+0.024}_{-0.023}{\pm}0.022$		¹⁰ AUBERT	03c BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$1.533 \!\pm\! 0.034 \!\pm\! 0.038$		¹¹ AUBERT	03H BABR	$e^+ e^- ightarrow ~ \Upsilon(4S)$
$1.497 \!\pm\! 0.073 \!\pm\! 0.032$		¹² ACOSTA	02C CDF	<i>р р</i> ат 1.8 ТеV
$1.529\!\pm\!0.012\!\pm\!0.029$		¹³ AUBERT	02H BABR	$e^+e^- ightarrow~~arkappa(4S)$
$1.546\!\pm\!0.032\!\pm\!0.022$		¹⁴ AUBERT	01F BABR	$e^+e^- ightarrow~argama(4S)$
$1.541\!\pm\!0.028\!\pm\!0.023$		¹³ ABBIENDI,G	00B OPAL	$e^+e^- \rightarrow Z$
$1.518\!\pm\!0.053\!\pm\!0.034$		¹⁵ BARATE	00r ALEP	$e^+e^- \rightarrow Z$
$1.523 \!\pm\! 0.057 \!\pm\! 0.053$		¹⁶ ABBIENDI	99J OPAL	$e^+e^- \rightarrow Z$
$1.474 \!\pm\! 0.039 \!+\! 0.052 \\ -0.051$		¹⁵ ABE	98Q CDF	<i>р</i> р _р ат 1.8 ТеV
$1.52\ \pm 0.06\ \pm 0.04$		¹⁶ ACCIARRI	98s L3	$e^+e^- \rightarrow Z$
$1.64\ \pm 0.08\ \pm 0.08$		¹⁶ ABE	97j SLD	$e^+ e^- \rightarrow Z$
$1.532\!\pm\!0.041\!\pm\!0.040$		¹⁷ ABREU	97F DLPH	$e^+e^- \rightarrow Z$
$1.25 \begin{array}{c} +0.15 \\ -0.13 \end{array} \pm 0.05$	121	¹² BUSKULIC	96J ALEP	$e^+e^- \rightarrow Z$
$\begin{array}{rrrr} 1.49 & +0.17 & +0.08 \\ & -0.15 & -0.06 \end{array}$		¹⁸ BUSKULIC	96J ALEP	$e^+e^- \rightarrow Z$
$1.61 \begin{array}{c} +0.14 \\ -0.13 \end{array} \pm 0.08$		^{15,19} ABREU	95Q DLPH	$e^+e^- \rightarrow Z$
$1.63\ \pm 0.14\ \pm 0.13$		²⁰ ADAM	95 DLPH	$e^+e^- \rightarrow Z$
$1.53\ \pm 0.12\ \pm 0.08$		^{15,21} AKERS	95⊤ OPAL	$e^+e^- \rightarrow Z$

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

$1.554 \pm$	±0.030±	-0.019		¹⁴ ABE	02н	BELL	Repl. by ABE 05B
1.58 ±	±0.09 ±	-0.02		¹² ABE	98 B	CDF	Repl. by ACOSTA 02C
1.54 ±	±0.08 ±	-0.06		¹⁵ ABE	96 C	CDF	Repl. by ABE 98Q
1.55 ±	±0.06 ±	-0.03		²² BUSKULIC	96J	ALEP	$e^+e^- \rightarrow Z$
1.61 ±	±0.07 ±	±0.04		¹⁵ BUSKULIC	96J	ALEP	Repl. by BARATE 00R
1.62 ±	±0.12			²³ ADAM	95	DLPH	$e^+e^- \rightarrow Z$
$1.57 \pm$	±0.18 ±	-0.08	121	¹² ABE	94 D	CDF	Repl. by ABE 98B
1.17 +	+0.29 ∃ -0.23 ∃	±0.16	96	¹⁵ ABREU	93 D	DLPH	Sup. by ABREU 95Q
1.55 ±	±0.25 ±	-0.18	76	²⁰ ABREU	93 G	DLPH	Sup. by ADAM 95
1.51 +	+0.24 + -0.23 -	+0.12 -0.14	78	¹⁵ ACTON	93 C	OPAL	Sup. by AKERS 95⊤
1.52 +	+0.20 + -0.18 -	+0.07 -0.13	77	¹⁵ BUSKULIC	93 D	ALEP	Sup. by BUSKULIC 96J
1.20 _	+0.52 + -0.36 -	+0.16 -0.14	15	²⁴ WAGNER	90	MRK2	$E_{\rm cm}^{ee}$ = 29 GeV
0.82 4	+0.57 ∃ -0.37 ∃	±0.27		²⁵ AVERILL	89	HRS	E ^{ee} _{cm} = 29 GeV

⁵ Measured mean life using $B^0 \rightarrow J/\psi K^{*0}$ decays.

⁶Measured mean life using $B^0 \rightarrow J/\psi K_s$ decays.

⁷ Measurement performed using a combined fit of *CP*-violation, mixing and lifetimes.

- ⁸ Measured using the time-dependent angular analysis of $B^0_d \rightarrow J/\psi \kappa^{*0}$ decays.
- 9 Measurement performed using an inclusive reconstruction and B flavor identification technique.
- ¹⁰ AUBERT 03C uses a sample of approximately 14,000 exclusively reconstructed $B^0 \rightarrow D^*(2010)^- \ell \nu$ and simultaneously measures the lifetime and oscillation frequency.
- ¹¹ Measurement performed with decays $B^0 \rightarrow D^{*-}\pi^+$ and $B^0 \rightarrow D^{*-}\rho^+$ using a partial reconstruction technique.
- ¹² Measured mean life using fully reconstructed decays.

¹³Data analyzed using partially reconstructed $\overline{B}^0 \rightarrow D^{*+} \ell^- \overline{\nu}$ decays.

- 14 Events are selected in which one *B* meson is fully reconstructed while the second *B* meson is reconstructed inclusively.
- ¹⁵ Data analyzed using $D/D^*\ell X$ event vertices.
- ¹⁶ Data analyzed using charge of secondary vertex.
- ¹⁷ Data analyzed using inclusive $D/D^* \ell X$.
- ¹⁸ Measured mean life using partially reconstructed $D^{*-}\pi^+X$ vertices.
- ¹⁹ ABREU 95Q assumes $B(B^0 \rightarrow D^{**-} \ell^+ \nu_{\ell}) = 3.2 \pm 1.7\%$.
- 20 Data analyzed using vertex-charge technique to tag B charge.
- ²¹AKERS 95T assumes $B(B^0 \rightarrow D_s^{(*)}D^{0(*)}) = 5.0 \pm 0.9\%$ to find B^+/B^0 yield.
- ²² Combined result of $D/D^* \ell x$ analysis, fully reconstructed B analysis, and partially reconstructed $D^{*-} \pi^+ X$ analysis.
- ²³ Combined ABREU 95Q and ADAM 95 result.
- ²⁴ WAGNER 90 tagged B^0 mesons by their decays into $D^{*-}e^+\nu$ and $D^{*-}\mu^+\nu$ where the D^{*-} is tagged by its decay into $\pi^-\overline{D}^0$.
- ²⁵ AVERILL 89 is an estimate of the B^0 mean lifetime assuming that $B^0 \rightarrow D^{*+} + X$ always.

MEAN LIFE RATIO τ_{B^+}/τ_{B^0}

 τ_{B^+}/τ_{B^0} (direct measurements) "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 corrections between the measurements and asymmetric lifetime errors.

<u>VALU</u>E DOCUMENT ID TECN COMMENT EVTS The data in this block is included in the average printed for a previous datablock.

1.071±0.009 OU	R EVALUATIO	N		
$1.080 \pm 0.016 \pm 0.000$	14	²⁶ ABAZOV	05D D0	<i>р</i> рат 1.96 ТеV
$1.066 \pm 0.008 \pm 0.008$	08	²⁷ ABE	05B BELL	$e^+e^- ightarrow ~\Upsilon(4S)$
$1.060 \pm 0.021 \pm 0.001$	24	²⁸ ABDALLAH	04e DLPH	$e^+e^- \rightarrow Z$
$1.093 \pm 0.066 \pm 0.000$	28	²⁹ ACOSTA	02C CDF	p p at 1.8 TeV
$1.082 \pm 0.026 \pm 0.0026$	12	³⁰ AUBERT	01F BABR	$e^+e^- ightarrow ~\Upsilon(4S)$
$1.085\!\pm\!0.059\!\pm\!0.0$	18	²⁶ BARATE	00r ALEP	$e^+e^- \rightarrow Z$
$1.079 \pm 0.064 \pm 0.004$	941	³¹ ABBIENDI	99j OPAL	$e^+e^- \rightarrow Z$
$1.110 \pm 0.056 \substack{+0.0\\-0.0}$)33)30	²⁶ ABE	98Q CDF	<i>pp</i> at 1.8 TeV
$1.09 \pm 0.07 \pm 0.00$	13	³¹ ACCIARRI	98s L3	$e^+e^- \rightarrow Z$
$1.01 \ \pm 0.07 \ \pm 0.0$	6	³¹ ABE	97J SLD	$e^+e^- \rightarrow Z$
$1.27 \begin{array}{c} +0.23 \\ -0.19 \end{array} \begin{array}{c} +0.0 \\ -0.0 \end{array}$)3)2	²⁹ BUSKULIC	96J ALEP	$e^+e^- \rightarrow Z$
$1.00 \ \begin{array}{c} +0.17 \\ -0.15 \end{array} \pm 0.17$.0 2	^{6,32} ABREU	95Q DLPH	$e^+e^- \rightarrow Z$
$1.06 \begin{array}{c} +0.13 \\ -0.10 \end{array} \pm 0.13$.0	³³ ADAM	95 DLPH	$e^+e^- \rightarrow Z$
$0.99 \ \pm 0.14 \ \begin{array}{c} +0.0 \\ -0.0 \end{array}$	95 2 94	^{6,34} AKERS	95⊤ OPAL	$e^+e^- \rightarrow Z$
\bullet \bullet \bullet We do not	use the followi	ng data for average	s, fits, limits,	etc. • • •
$1.091 \pm 0.023 \pm 0.000$)14	³⁰ ABE	02H BELL	Repl. by ABE 05B
$1.06 \pm 0.07 \pm 0.0$	2	²⁹ ABE	98b CDF	Repl. by ACOSTA 02C
$1.01 \pm 0.11 \pm 0.0$	2	²⁶ ABE	96c CDF	Repl. by ABE 98Q
$1.03 \pm 0.08 \pm 0.00$	2	³⁵ BUSKULIC	96J ALEP	$e^+e^- \rightarrow Z$
$0.98\ \pm 0.08\ \pm 0.08$	13	²⁶ BUSKULIC	96J ALEP	Repl. by BARATE 00R
$1.02\ \pm 0.16\ \pm 0.0$	5 269	²⁹ ABE	94d CDF	Repl. by ABE 98B
$1.11 \begin{array}{c} +0.51 \\ -0.39 \end{array} \pm 0.1$	1 188	²⁶ ABREU	93D DLPH	Sup. by ABREU 95Q
$1.01 \begin{array}{c} +0.29 \\ -0.22 \end{array} \pm 0.1$.2 253	³³ ABREU	93G DLPH	Sup. by ADAM 95
$1.0 \begin{array}{c} +0.33 \\ -0.25 \end{array} \pm 0.0$	08 130	ACTON	93c OPAL	Sup. by AKERS 95T
$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$.8 2 154	²⁶ BUSKULIC	93D ALEP	Sup. by BUSKULIC 96J

²⁶ Data analyzed using $D/D^* \mu X$ vertices.

²⁷ Measurement performed using a combined fit of *CP*-violation, mixing and lifetimes.

 28 Measurement performed using an inclusive reconstruction and B flavor identification technique.

²⁹ Measured using fully reconstructed decays.

 30 Events are selected in which one B meson is fully reconstructed while the second B meson is reconstructed inclusively.

³¹ Data analyzed using charge of secondary vertex. ³² ABREU 95Q assumes $B(B^0 \rightarrow D^{**-} \ell^+ \nu_{\ell}) = 3.2 \pm 1.7\%$.

³³ Data analyzed using vertex-charge technique to tag *B* charge. ³⁴ AKERS 95T assumes $B(B^0 \rightarrow D_s^{(*)} D^{0(*)}) = 5.0 \pm 0.9\%$ to find B^+/B^0 yield.

³⁵ Combined result of $D/D^* \ell X$ analysis and fully reconstructed B analysis.

τ_{B^+}/τ_{B^0} (inferred from branching fractions)

These measurements are inferred from the branching fractions for semileptonic decay or other spectator-dominated decays by assuming that the rates for such decays are equal for B^0 and B^+ . We do not use measurements which assume equal production of B^0 and B^+ because of the large uncertainty in the production ratio.

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
The data in this block	is inclu	uded in t	he average printed for	a previous	datablock.

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

$0.95^{+0.117}_{-0.080}{\pm}0.091$		³⁶ ARTUSO	97 CLE2	$e^+ e^- ightarrow ~\Upsilon(4S)$
$1.15 {\pm} 0.17 {\ \pm} 0.06$		³⁷ JESSOP	97 CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
$0.93 {\pm} 0.18 \ {\pm} 0.12$		³⁸ ATHANAS	94 CLE2	Sup. by AR-
$0.91 \pm 0.27 \pm 0.21$		³⁹ ALBRECHT	92c ARG	$e^+e^- \rightarrow \Upsilon(4S)$
$1.0 \ \pm 0.4$		29 ^{39,40} ALBRECHT	92g ARG	$e^+e^- \rightarrow \Upsilon(4S)$
$0.89 \!\pm\! 0.19 \ \pm 0.13$		³⁹ FULTON	91 CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
$1.00\!\pm\!0.23\ \pm0.14$		³⁹ ALBRECHT	89l ARG	$e^+e^- \rightarrow \Upsilon(4S)$
0.49 to 2.3	90	⁴¹ BEAN	87b CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

 36 ARTUSO 97 uses partial reconstruction of $B \rightarrow D^* \ell \nu_\ell$ and independent of B^0 and B^+ production fraction.

³⁷Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

 38 ATHANAS 94 uses events tagged by fully reconstructed B^- decays and partially or fully reconstructed B^0 decays.

³⁹Assumes equal production of B^0 and B^+ .

⁴⁰ ALBRECHT 92G data analyzed using $B \rightarrow D_s \overline{D}, D_s \overline{D}^*, D_s^* \overline{D}, D_s^* \overline{D}^*$ events.

⁴¹BEAN 87B assume the fraction of $B^0 \overline{B}^0$ events at the $\Upsilon(4S)$ is 0.41.

$\operatorname{sgn}(\operatorname{Re}(\lambda_{CP})) \, \Delta \Gamma_{B^0_{\mathcal{A}}} \, / \, \Gamma_{B^0_{\mathcal{A}}}$

 ${\sf \Gamma}_{{\cal B}^0_{\cal A}}$ and ${\Delta}{\sf \Gamma}_{{\cal B}^0_{\cal A}}$ are the decay rate average and difference between two B_d^0 CP eigenstates (heavy - light). The λ_{CP} characterizes B^0 and \overline{B}^0 decays to states of charmonium plus K_I^0 , see the review on "CP Violation" in the reviews section.

"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 corrections between the measurements.

VALUE	DOCUMENT ID	TECN	COMMENT
-0.008 ± 0.037 OUR EVALUATION			
-0.008±0.037±0.018 42	AUBERT,B 04	C BABR	$e^+e^- \rightarrow \Upsilon(4S)$
42 Corresponds to 90% confidence r	ange [-0.084, 0.06	68].	l

		$ \Delta\Gamma_{B^0_d} /\Gamma_{B^0_d}$	1		
VALUE	<u>CL%</u>	DOCUMENT ID	TECN	COMMENT	
The data in this block is i	ncluded in	the average prin	ited for a prev	vious datablo	ck.
<0.18	95 43	ABDALLAH	03b DLPH	$e^+e^- \rightarrow Z$	2
• • • We do not use the	following d	ata for averages	, fits, limits, o	etc. ● ● ●	
<0.80	95 44,45	BEHRENS	00B CLE2	$e^+e^- \rightarrow 7$	$\Gamma(4S)$
43 Using the measured $ au$	$_{B0}$ =1.55 ±	0.03 ps.			
$^{44}{\rm BEHRENS}$ 00B uses	high-mome	ntum lepton ta	gs and parti	ally reconstru	ucted \overline{B}^0 –
$D^{*+}\pi^-$, $ ho^-$ decays t	to determin	e the flavor of t	he <i>B</i> meson.		
⁴⁵ Assumes Δ_{md} =0.478	$\pm~0.018$ p	s $^{-1}$ and $ au_{B^0} {=} 1$	1.548 ± 0.032	2 ps.	

B⁰ DECAY MODES

 \overline{B}^0 modes are charge conjugates of the modes below. Reactions indicate the weak decay vertex and do not include mixing. 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% $B^0 \overline{B}{}^0$ 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 ψ 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	Scale factor/ Fraction (Γ_i/Γ) Confidence level
Γ_1	$\ell^+ u_\ell$ anything	[a] ($10.5~\pm~0.8$) %
Γ2	$D^-\ell^+ u_\ell$	[a] (2.12± 0.20) %
Γ ₃	$D^*(2010)^- \ell^+ u_\ell$	[a] (5.34± 0.20)%
Г4	$ ho^-\ell^+ u_\ell$	[a] (2.6 \pm 0.7) $ imes$ 10 $^{-4}$
Γ ₅	$\pi^-\ell^+\nu_\ell$	[a] ($1.33\pm~0.22) imes10^{-4}$

Inclusive modes

Г ₆	$\pi^- \mu^+ u_\mu$		
Γ ₇	K^{\pm} anything	$(\begin{array}{ccc} 78 & \pm & 8 \end{array})$ %	
Γ ₈	$D^0 X$	$($ 6.3 \pm 2.0 $)$ %	
Γ ₉	$\overline{D}^0 X$	$(51 \pm 4)\%$	
Γ ₁₀	D^+X	< 5.1 %	CL=90%
Γ_{11}	D^-X	(40 \pm 5)%	
Γ_{12}	$D_s^+ X$	(10.9 $\stackrel{+}{-}$ $\stackrel{4.4}{3.2}$) %	
Г ₁₃	$D_s^- X$	< 8.7 %	CL=90%
Γ_{14}	$\Lambda_c^+ X$	< 3.8 %	CL=90%
Γ ₁₅	$\overline{\Lambda}_{c}^{-}X$	(4.9 $\stackrel{+}{}$ $\stackrel{2.5}{_{-}}$)%	
Γ_{16}	τX	$(104 \pm 8)\%$	
Γ_{17}	сX	(24 \pm 5)%	
Г ₁₈	c cX	$(128 {+11\atop -10})\ \%$	

 D, D^* , or D_s modes

	, , , 3		-	
Γ ₁₉	$D^-\pi^+$	($2.87 \pm 0.19) \times 10^{-3}$	
Γ ₂₀	$D^- ho^+$	(7.7 \pm 1.3 $)\times10^{-3}$	
Γ ₂₁	$D^{-}K^{*}(892)^{+}$	($3.7~\pm~1.8$ $)\times10^{-4}$	
Γ ₂₂	$D^- \omega \pi^+$	($2.8~\pm~0.6$ $)\times10^{-3}$	
Γ ₂₃	D^-K^+	($2.0~\pm~0.6$ $)\times10^{-4}$	
Γ ₂₄	$D^- K^+ \overline{K}{}^0$	<	3.1×10^{-4}	CL=90%
Γ ₂₅	$D^{-}K^{+}\overline{K}^{*}(892)^{0}$	($8.8~\pm~1.9$) $\times10^{-4}$	
Γ ₂₆	$\overline{D}{}^{0}\pi^{+}\pi^{-}$	($8.0~\pm~1.6$) $\times10^{-4}$	
Γ ₂₇	$D^{*}(2010)^{-}\pi^{+}$	($2.76 \pm 0.21) \times 10^{-3}$	
Γ ₂₈	$D^-\pi^+\pi^+\pi^-$	($8.0~\pm~2.5$ $)\times10^{-3}$	
Γ ₂₉	$(D^{-}\pi^{+}\pi^{+}\pi^{-})$ nonresonant	($3.9~\pm~1.9$) $\times10^{-3}$	
Γ ₃₀	$D^-\pi^+ ho^0$	($1.1~\pm~1.0$ $)\times10^{-3}$	
Γ ₃₁	$D^-a_1(1260)^+$	($6.0~\pm~3.3$ $)\times10^{-3}$	
Γ ₃₂	$D^*(2010)^- \pi^+ \pi^0$	(1.5 \pm 0.5) %	
Г ₃₃	$D^*(2010)^- \rho^+$	(6.8 \pm 0.9 $)\times10^{-3}$	
Γ ₃₄	$D^{*}(2010)^{-}K^{+}$	($2.0~\pm~0.5$ $)\times10^{-4}$	
Γ ₃₅	$D^{*}(2010)^{-}K^{*}(892)^{+}$	($3.8~\pm~1.5$ $)\times10^{-4}$	
Г ₃₆	$D^*(2010)^- K^+ \overline{K}^0$	<	4.7 $\times 10^{-4}$	CL=90%
Γ ₃₇	$D^{*}(2010)^{-} K^{+} \overline{K}^{*}(892)^{0}$	($1.29\pm~0.33) imes 10^{-3}$	
Γ ₃₈	$D^{*}(2010)^{-}\pi^{+}\pi^{+}\pi^{-}$	(7.0 \pm 0.8 $)\times10^{-3}$	S=1.3
Γ ₃₉	$(D^*(2010)^-\pi^+\pi^+\pi^-)$ non-	(0.0 \pm 2.5 $)\times10^{-3}$	
	resonant		· · · · ·	
Γ ₄₀	$D^*(2010)^- \pi^+ ho^0$	(5.7 \pm 3.2) $ imes$ 10 ⁻³	
Γ_{41}	$D^*(2010)^- a_1(1260)^+$	($1.30\pm$ 0.27) %	
Γ ₄₂	$D^*(2010)^- \pi^+ \pi^+ \pi^- \pi^0$	(1.76± 0.27) %	
Г ₄₃	$D^{*-}3\pi^+2\pi^-$	(4.7 \pm 0.9 $)\times10^{-3}$	
Г ₄₄	$D^{*}(2010)^{-} p \overline{p} \pi^{+}$	($6.5~\pm~1.6$) $\times~10^{-4}$	
нтт	P://PDG.LBL.GOV Page 7		Created: 6/24/20	05 17:16
	-		· · · ·	

Г ₆₈	$D_{s}^{+}\pi^{-}$	($2.7~\pm~1.0$ $)\times10^{-5}$	
Г ₆₉	$D_{s}^{\tilde{s}+}\pi^{-}$	<	4.1×10^{-5}	CL=90%
Γ ₇₀	$D_{s}^{+}\rho^{-}$	<	7×10^{-4}	CL=90%
Γ ₇₁	$D_{c}^{*+}\rho^{-}$	<	8×10^{-4}	CL=90%
Γ ₇₂	$D_{-}^{+}a_{1}(1260)^{-}$	<	2.6 $\times 10^{-3}$	CL=90%
Γ ₇₃	$D_{*}^{*+}a_{1}(1260)^{-}$	<	2.2 $\times 10^{-3}$	CL=90%
Γ ₇₄	$D - K^+$	(3.8 \pm 1.3) $ imes$ 10 ⁻⁵	
Г ₇₅	$D_{-}^{s-}K^{+}$	<	2.5 $\times 10^{-5}$	CL=90%
Г ₇₆	$D^{s} K^{*}(892)^{+}$	<	9.9 $\times 10^{-4}$	CL=90%
70 Г77	$D^{*-}K^{*}(892)^{+}$	<	1.1×10^{-3}	CL=90%
Γ ₇₀	$D^-\pi^+ K^0$	<	5×10^{-3}	CI = 90%
· / o	$D^{*-}\pi^{+}\kappa^{0}$	~	31×10^{-3}	CL = 90%
· 79	$D^{-}\pi^{+}K^{*}(892)^{0}$		10^{-3}	CL 90%
180 Гал	$D_{s}^{*-}\pi^{+}K^{*}(802)^{0}$		$\times 10^{-3}$	CL = 90%
181 Lee	$\frac{D}{D^0}\kappa^0$	(5.0 ± 1.4) $\times 10^{-5}$	CL—9070
г <u>82</u> Гор	$\frac{D}{D^0} K^* (892)^0$	(5.0 ± 1.4) × 10 48 + 12) × 10 ⁻⁵	
-83 Γ₀₄	$\frac{D}{D^0}\pi^0$	($(2.91 \pm 0.28) \times 10^{-4}$	
- 84 Гоб	$\frac{D}{D^0} \rho^0$	($2.91 \pm 0.20) \times 10^{-4}$ 2.9 + 1.1) × 10 ⁻⁴	
Γ ₈₆	$\frac{1}{\overline{D}}^{0}\eta$	(2.2 ± 0.5) × 10 ⁻⁴	S=1.6
Γ ₈₇	$\overline{D}^0 \eta'$	(1.7 ± 0.4) $\times 10^{-4}$	
Г ₈₈	$\overline{D}{}^{0}\omega$	($2.5~\pm~0.6~)\times10^{-4}$	S=1.5
Г ₈₉	$D^0 K^*(892)^0$	<	1.8×10^{-5}	CL=90%
Г ₉₀	$\overline{D}^{*0}\gamma$	<	5.0 $\times 10^{-5}$	CL=90%
Г ₉₁	$\overline{D}^{*}(2007)^{0}\pi^{0}$	(2.7 \pm 0.5 $)\times10^{-4}$	
Г ₉₂	$\underline{D}^{*}(2007)^{0}\rho^{0}$	<	5.1 $\times 10^{-4}$	CL=90%
Г ₉₃	$D^*(2007)^0\eta$	(2.6 ± 0.6) $\times 10^{-4}$	
l ₉₄	$D^*(2007)^0 \eta'$	<	2.6 $\times 10^{-4}$	CL=90%
l 95	$D^*(2007)^0 \pi^+ \pi^-$	($6.2 \pm 2.2) \times 10^{-4}$	
Г ₉₆	$D^{*}(2007)^{\circ}K^{\circ}$	<	6.6×10^{-5}	CL=90%
Г <u>97</u> Г	$D^{*}(2007)^{\circ} K^{*}(892)^{\circ}$ $D^{*}(2007)^{0} K^{*}(802)^{0}$	<	6.9×10^{-5}	CL=90%
г <u>98</u> Г	$D^{*}(2007)^{0}\pi^{+}\pi^{+}\pi^{-}\pi^{-}$	< (4.0×10^{-3}	CL=90%
г <u>99</u> Гара	$D^{*}(2010)^{+} D^{*}(2010)^{-}$	(2.7 ± 0.5) × 10 ⁻⁴	
100 L	$\frac{D}{D^*}(2007)^0$	($8.7 \pm 1.0 \times 10^{-4}$	
' 101 Г100	$D^{*}(2010)^{+}D^{-}$		$4.2 \pm 1.1 \times 10^{-4}$	CI 90%
Γ_{102}	$D^{*}(2010)^{-}D^{+} +$	($93 + 15) \times 10^{-4}$	CL_30/0
103	$D^*(2010)^+ D^-$	(5.5 ± 1.5) × 10	
Γ ₁₀₄	$D^*(2007)^0 \overline{D}^*(2007)^0$	<	2.7 %	CL=90%
Γ_{105}	$D^{-}D^{0}K^{+}$	(1.7 \pm 0.4 $)\times10^{-3}$	
Γ ₁₀₆	$D^{-}D^{*}(2007)^{0}K^{+}$	(4.6 \pm 1.0 $) \times 10^{-3}$	
Γ ₁₀₇	$D^*(2010)^- D^0 K^+$	(3.1 $\stackrel{+}{} \begin{array}{c} 0.6\\ -\end{array}$) \times 10^{-3}	
Γ_{108}	$D^{*}(2010)^{-} D^{*}(2007)^{0} K^{+}$	(1.18± 0.20) %	
100		(- , · -	

Γ109	$D^{-}D^{+}K^{0}$	<	1.7	imes 10 ⁻³	CL=90%
Γ ₁₁₀	$D^{*}(2010)^{-}D^{+}K^{0} +$	($6.5 \pm$	1.6) $ imes$ 10 $^{-3}$	
110	$D^{-}D^{*}(2010)^{+}K^{0}$,		,	
Γ111	$D^{*}(2010)^{-}D^{*}(2010)^{+}K^{0}$	(8.8 ±	1.9) $ imes$ 10 $^{-3}$	
Γ ₁₁₂	$\overline{D}^{0} D^{0} K^{0}$	<	1.4	× 10 ⁻³	CL=90%
Γ ₁₁₃	$\overline{D}{}^{0} D^{*} (2007)^{0} K^{0} +$	<	3.7	imes 10 ⁻³	CL=90%
	$\overline{D}^{*}(2007)^{0} D^{0} K^{0}$				
Г ₁₁₄	$\overline{D}^{*}(2007)^{0} D^{*}(2007)^{0} K^{0}$	<	6.6	imes 10 ⁻³	CL=90%
Γ_{115}	$(\overline{D}+\overline{D}^*)(D+D^*)K$	($4.3\ \pm$	0.7)%	
	Charm	onium mode	5		
Γ ₁₁₆	$\eta_c K^0$	(1.16±	$0.26) \times 10^{-3}$	
Γ ₁₁₇	$\eta_c K^* (892)^0$	($1.6~\pm$	0.7) $\times 10^{-3}$	
Γ ₁₁₈	$\tilde{J}/\psi(1S)\tilde{K}^0$	($8.5 \pm$	0.5) $\times 10^{-4}$	
Γ ₁₁₉	$J/\psi(1S)K^+\pi^-$	($1.2~\pm$	$0.6) \times 10^{-3}$	
Γ ₁₂₀	$J/\psi(1S) K^*(892)^0$	($1.31\pm$	$0.07) \times 10^{-3}$	
Γ_{121}	$J/\psi(1S)\eta K_S^0$	(8 ±	4) $ imes 10^{-5}$	
Γ ₁₂₂	$J/\psi(1S)\phi K^{0}$	(9.4 ±	2.6) $ imes$ 10 $^{-5}$	
Γ ₁₂₃	$J/\psi(1S) K(1270)^0$	($1.3~\pm$	0.5) $ imes 10^{-3}$	
Γ ₁₂₄	$J/\psi(1S)\pi^0$	($2.2\ \pm$	0.4 $)\times10^{-5}$	
Γ ₁₂₅	$J/\psi(1S)\eta$	<	2.7	imes 10 ⁻⁵	CL=90%
Γ ₁₂₆	$J/\psi(1S)\pi^+\pi^-$	($4.6\ \pm$	0.9 $)\times10^{-5}$	
Г ₁₂₇	$J/\psi(1S) ho^0$	($1.6~\pm$	0.7) $\times10^{-5}$	
Г ₁₂₈	$J/\psi(1S)\omega$	<	2.7	imes 10 ⁻⁴	CL=90%
Г ₁₂₉	$J/\psi(1S)\phi$	<	9.2	imes 10 ⁻⁶	CL=90%
Γ ₁₃₀	$J/\psi(1S)\eta'(958)$	<	6.3	imes 10 ⁻⁵	CL=90%
Г ₁₃₁	$J/\psi(1S) K^0 \pi^+ \pi^-$	($1.0~\pm$	0.4) $\times 10^{-3}$	
Г ₁₃₂	$J/\psi(1S){\cal K}^0 ho^0$.	(5.4 \pm	3.0) $\times 10^{-4}$	
Г ₁₃₃	$J/\psi(1S)K^{*}(892)^{+}\pi^{-}$	(8 ±	4) $\times 10^{-4}$	
Γ ₁₃₄	$J/\psi(1S) K^*(892)^0 \pi^+ \pi^-$	($6.6~\pm$	2.2) $\times 10^{-4}$	
Γ ₁₃₅	$J/\psi(1S) p\overline{p}$	<	1.9	$\times 10^{-6}$	CL=90%
Γ ₁₃₆	$J/\psi(1S)\gamma$	<	1.6	$\times 10^{-6}$	CL=90%
Γ ₁₃₇	$\psi(2S)K^0$	($6.2 \pm$	$0.7) \times 10^{-4}$	
1 ₁₃₈	$\psi(2S)K^+\pi^-$	<	1	$\times 10^{-3}$	CL=90%
1 ₃₉	$\psi(2S)K^*(892)^{\circ}$	(8.0 ±	1.3) \times 10 ⁻⁴	
1 ₁₄₀	$\chi_{c0}(1P)K^{0}$	<	5.0	$\times 10^{-4}$	CL=90%
Γ_{141}	$\chi_{c1}(1P)K^0$	(4.0 +	$^{1.2}_{1.0}$) $ imes$ 10 ⁻⁴	
Γ ₁₄₂	$\chi_{c1}(1P) K^*(892)^0$	($4.1 \ \pm$	1.4 $)\times10^{-4}$	
	Ko	r K* modes			
Г ₁₄₃	$K^+\pi^-$	($1.82\pm$	$0.08) imes 10^{-5}$	
Γ_{144}	$\kappa^0 \pi^0$	($1.17\pm$	$(0.14) \times 10^{-5}$	
Γ_{145}	$\eta' K^0$	(6.3 ±	0.7) $\times 10^{-5}$	S=1.1
Γ_{146}	$\eta' {\cal K}^*(892)^0$	<	7.6	$\times 10^{-6}$	CL=90%

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Г ₁₄₇ Г140	$\eta K^{*}(892)^{0}$	($1.77\pm$	$0.23) \times 10^{-5}$	
Γ ₁₄₈	ωK^0	(5.5 +	$\frac{1.2}{1.0}$) × 10 ⁻⁶	
Γ150	$a_0^0 K^0$	<	7.8	$\times 10^{-6}$	CI =90%
· 150	$a_{-}^{-}K^{+}$	~	21	$\times 10^{-6}$	CI = 90%
- 151 - 151	$K_0^0 X^0$ (Familon)		53	$^{\times 10}_{\times 10}$	CL = 90%
ч 152 Г. – е	$\kappa_{S} \kappa^{*} (802)^{0}$		J.J J 2	$\times 10$ $\times 10^{-5}$	CL = 90 / 0
153 L	$\kappa + \kappa - $	<	2.3	× 10	CL=90 %
' 154 Г₁гг	$K_0 \frac{K_0}{K_0}$	_	15	× 10 [−] 6	CI90%
- 155 E	$K^{0} K^{0} K^{0}$		1.0 +	1.8 \. 10-6	CL_9070
156	$K_S K_S K_S$	(4.2 _	1.5) × 10 °	
I 157	$K^{+}\pi^{-}\pi^{0}$	(3.7 ±	$0.5) \times 10^{-5}$	
I 158	$K^+ \rho^-$	($8.5 \pm$	2.8) $\times 10^{-0}$	S=1.7
l ₁₅₉	$(K^+\pi^-\pi^0)$ non-resonant	<	9.4	$\times 10^{-0}$	CL=90%
l 160	$K_{x}^{*0}\pi^{0}$	[b] ($6.1 \pm$	1.6) \times 10 ⁻⁰	
Г ₁₆₁	$K^{0}\pi^{+}\pi^{-}$	($4.5 \ \pm$	0.4) $\times 10^{-5}$	
Γ ₁₆₂	$K^0 \rho^0$	<	3.9	$\times 10^{-5}$	CL=90%
Г ₁₆₃	$K^0 f_0(980)$	<	3.6	$\times 10^{-4}$	CL=90%
Г ₁₆₄	$K^{*}(892)^{+}\pi^{-}$	($1.38\pm$	$0.22) \times 10^{-5}$	
Γ ₁₆₅	$K_x^{*+}\pi^-$	[b] ($5.1~\pm$	1.6) $ imes$ 10 $^{-6}$	
Γ ₁₆₆	$K^{*}(892)^{0}\pi^{0}$	<	3.5	imes 10 ⁻⁶	CL=90%
Γ ₁₆₇	$K_2^*(1430)^+\pi^-$	<	1.8	imes 10 ⁻⁵	CL=90%
Γ ₁₆₈	$K^{\bar{0}}K^{-}\pi^{+}$	<	2.1	imes 10 ⁻⁵	CL=90%
Γ ₁₆₉	$K^+ K^- \pi^0$	<	1.9	imes 10 ⁻⁵	CL=90%
Γ ₁₇₀	$K^0 K^+ K^-$	($2.47\pm$	$0.23) \times 10^{-5}$	
Γ ₁₇₁	$\mathcal{K}^{0}\phi$	(8.6 +	$^{1.3}_{1.1}$) $ imes$ 10 ⁻⁶	
Γ_{172}	$K^-\pi^+\pi^+\pi^-$	[c] <	2.3	imes 10 ⁻⁴	CL=90%
Γ ₁₇₃	$K^{*}(892)^{0}\pi^{+}\pi^{-}$	<	1.4	imes 10 ⁻³	CL=90%
Γ ₁₇₄	$\dot{K}^{*}(892)^{0}\rho^{0}$	<	3.4	imes 10 ⁻⁵	CL=90%
Γ_{175}	$K^{*}(892)^{0}f_{0}(980)$	<	1.7	imes 10 ⁻⁴	CL=90%
Γ ₁₇₆	$K_1(1400)^+\pi^-$	<	1.1	imes 10 ⁻³	CL=90%
Γ ₁₇₇	$\tilde{K^{-}}a_{1}(1260)^{+}$	[c] <	2.3	imes 10 ⁻⁴	CL=90%
Γ ₁₇₈	$K^{*}(892)^{0} \vec{K}^{+} K^{-}$	<	6.1	imes 10 ⁻⁴	CL=90%
Γ ₁₇₉	$\hat{K}^{*}(\hat{892})^{0}\phi$	(9.5 ±	0.9) $ imes$ 10 $^{-6}$	
Γ ₁₈₀	$\overline{K}^{*}(892)^{0}K^{*}(892)^{0}$	<	2.2	$\times 10^{-5}$	CL=90%
Γ ₁₈₁	K*(892) ⁰ K*(892) ⁰	<	3.7	imes 10 ⁻⁵	CL=90%
Γ ₁₈₂	$K^{*}(892)^{+}K^{*}(892)^{-}$	<	1.41	imes 10 ⁻⁴	CL=90%
Γ_{183}	$K_1(1400)^0 \rho^0$	<	3.0	imes 10 ⁻³	CL=90%
Γ_{184}	$K_1(1400)^0 \phi$	<	5.0	imes 10 ⁻³	CL=90%
Γ_{185}	$K_{0}^{*}(1430)^{0}\phi$	S	een		
Γ ₁₀₆	$K_{2}^{(1430)0} a^{0}$	<	1.1	× 10 ⁻³	CL=90%
	$K^{*}(1430)^{0} \phi$		een		22 3070
181	$(2)^{+}$	5	CGII		

г	$K^{*}(002)0$	(4.01 0.00) + 10-5	
1 188 F	$\kappa (092) \gamma \kappa^{0}$	($4.01 \pm 0.20) \times 10^{-6}$	
1 189	$\kappa^{+}\varphi\gamma$	< ($8.3 \times 10^{\circ}$	CL=90%
I 190	$\kappa \cdot \pi \gamma$	($4.6 \pm 1.4) \times 10^{-0}$	a
1 ₁₉₁	$\kappa^{*}(1410)\gamma$	<	1.3×10^{-4}	CL=90%
1 ₁₉₂	$K^+\pi^-\gamma$ nonresonant	<	2.6 $\times 10^{-0}$	CL=90%
Г ₁₉₃	$K_1(1270)^{0} \gamma$	<	7.0 $\times 10^{-3}$	CL=90%
Γ ₁₉₄	$K_1(1400)^0 \gamma$	<	4.3 $\times 10^{-3}$	CL=90%
Γ ₁₉₅	$K_2^*(1430)^0 \gamma$	($1.24\pm~0.24)\times10^{-5}$	
Γ ₁₉₆	$K^*(1680)^0\gamma$	<	2.0×10^{-3}	CL=90%
Γ ₁₉₇	$K_{3}^{*}(1780)^{0}\gamma$	<	1.0 %	CL=90%
Γ ₁₉₈	$K_{4}^{*}(2045)^{0}\gamma$	<	4.3 $\times 10^{-3}$	CL=90%
200				
-		meson r	modes	.
l ₁₉₉	$ ho$ o γ	<	4 $\times 10^{-7}$	CL=90%
I ₂₀₀	$\omega \gamma$	<	1.0×10^{-0}	CL=90%
Γ ₂₀₁	$\phi \gamma$	<	3.3 $\times 10^{-0}$	CL=90%
Γ ₂₀₂	$\pi^+\pi^-$	(4.6 \pm 0.4) \times 10 ⁻⁶	
Γ ₂₀₃	$\pi^0 \pi^0$	(1.9 \pm 0.5 $)\times10^{-6}$	
Γ ₂₀₄	$\eta \pi^0$	<	2.5 $\times 10^{-6}$	CL=90%
Γ ₂₀₅	$\eta \eta$	<	2.8×10^{-6}	CL=90%
Γ ₂₀₆	$\eta' \pi^0$	<	3.7×10^{-6}	CL=90%
Γ ₂₀₇	$\dot{\eta'}\eta'$	<	1.0×10^{-5}	CL=90%
Γ_{208}	$\dot{\eta}'\dot{\eta}$	<	4.6 $\times 10^{-6}$	CL=90%
Γ ₂₀₉	$\eta' \rho^0$	<	4.3 $\times 10^{-6}$	CL=90%
Γ_{210}	$\eta \rho^0$	<	1.5×10^{-6}	CL=90%
Γ_{211}	$\omega \eta$	(4.0 \pm 1.3) $\times10^{-6}$	
Γ ₂₁₂	$\omega \eta'$	<	2.8 $\times 10^{-6}$	CL=90%
Γ213	$\omega \rho^0$	<	1.1×10^{-5}	CL=90%
Γ ₂₁₄	ωω	<	1.9×10^{-5}	CL=90%
Γ ₂₁₅	$\phi \pi^{0}$	<	1.0×10^{-6}	CL=90%
L215	ϕn	<	1.0×10^{-6}	CL=90%
Γ ₂₁₇	$\phi n'$	<	4.5 $\times 10^{-6}$	CL=90%
L218	$\phi \rho^0$	<	1.3×10^{-5}	CL=90%
Γ ₂₁₀	$\phi \omega$	<	2.1 $\times 10^{-5}$	CL=90%
[219	$\phi \phi$	<	1.5×10^{-6}	CL=90%
F221	$a_{n}^{\dagger\mp}\pi^{\pm}$	<	5.1 $\times 10^{-6}$	CL=90%
<u>Г</u> 221	$^{0}_{\pi^{+}\pi^{-}\pi^{0}}$	<	7.2×10^{-4}	CI = 90%
Гоор	$a^0 \pi^0$	($18 + 08 \times 10^{-6}$	S-1 3
· 223	$\rho^{\mp}\pi^{\pm}$	[d] ($2.28 \pm 0.25) \times 10^{-5}$	5-1.5
' 224 Гоог	p π $\pi + \pi^{-} \pi^{+} \pi^{-}$	[0] ($2.20 \pm 0.23) \times 10^{-4}$	CI00%
- 225 Ease			2.3×10^{-6}	CL = 90 / 0
- 226 Eas-	$(1260) \mp \pi^{\pm}$	- [d] -	2.1 $\land 10$ $\land 10 \rightarrow 10-4$	CL = 90 / 0
י 227 Гала	$2_1(1200)^{\pm} \pi^{\pm}$	[u] < [d] -	× 10 × 10-4	CL = 90 / 0
י 228 Г	$a_2(1320) + \pi$ $\pi^+ \pi^- \pi^0 \pi^0$	[a] <	3.0×10^{-3}	CL = 90%
229	$\mathcal{M}^{+}\mathcal{M}^{-}\mathcal{M}^{-}$	<	5.1 × 10 5	CL=90%

Γ ₂₃₀	$ ho^+ ho^-$	($3.0~\pm~0.6$)	$) \times 10^{-5}$	
Γ ₂₃₁	$a_1(1260)^0 \pi^0$	<	1.1	imes 10 ⁻³	CL=90%
Γ ₂₃₂	$\omega \pi^0$	<	1.2	imes 10 ⁻⁶	CL=90%
Γ ₂₃₃	$\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{0}$	<	9.0	imes 10 ⁻³	CL=90%
Γ ₂₃₄	$a_1(1260)^+ \rho^-$	<	3.4	$\times 10^{-3}$	CL=90%
Γ ₂₃₅	$a_1(1260)^0 \rho^0$	<	2.4	imes 10 ⁻³	CL=90%
Γ ₂₃₆	$\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}\pi^{-}$	<	3.0	$\times 10^{-3}$	CL=90%
Γ ₂₃₇	$a_1(1260)^+ a_1(1260)^-$	<	2.8	imes 10 ⁻³	CL=90%
Γ ₂₃₈	$\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}\pi^{0}$	<	1.1	%	CL=90%
	Baryon mod	es			
Γ ₂₃₉	p p	<	2.7	imes 10 ⁻⁷	CL=90%
Γ ₂₄₀	$p\overline{p}\pi^+\pi^-$	<	2.5	imes 10 ⁻⁴	CL=90%
Γ ₂₄₁	$p \overline{p} K^0$	($1.9 + 0.8 \\ - 0.6 \end{pmatrix}$) $ imes$ 10 $^{-6}$	
Γ ₂₄₂	$p\overline{p}K^*(892)^0$	<	7.6	imes 10 ⁻⁶	CL=90%
Г ₂₄₃	$p\overline{\Lambda}\pi^-$	($4.0 + 1.1 \\ - 1.0 >$) × 10 ⁻⁶	
Γ ₂₄₄	$p\overline{\Lambda}K^{-}$	<	8.2	imes 10 ⁻⁷	CL=90%
Γ ₂₄₅	$p \overline{\Sigma}{}^0 \pi^-$	<	3.8	imes 10 ⁻⁶	CL=90%
Γ ₂₄₆	$\overline{\Lambda}\Lambda$	<	1.0	imes 10 ⁻⁶	CL=90%
Γ ₂₄₇	$\Delta^0 \overline{\Delta^0}$	<	1.5	imes 10 ⁻³	CL=90%
Г ₂₄₈	$\underline{\Delta}^{++} \underline{\Delta}^{}$	<	1.1	$\times 10^{-4}$	CL=90%
Г ₂₄₉	$\underline{D}^{0} p \overline{p}$	($1.18\pm$ 0.22)) × 10 ⁻⁴	
Γ ₂₅₀	$\underline{D}^*(2007)^0 p \overline{p}$	(1.2 ± 0.4)) × 10 ⁻⁴	
Γ ₂₅₁	$\Sigma_c^{}\Delta^{++}$	<	1.0	$\times 10^{-3}$	CL=90%
Γ ₂₅₂	$\Lambda_c^- p \pi^+ \pi^-$	($1.3~\pm~0.4$)	$) \times 10^{-3}$	
Г ₂₅₃	$\overline{\Lambda}_{c}^{-} p$	($2.2~\pm~0.8$)	$) imes 10^{-5}$	
Γ ₂₅₄	$\overline{\Lambda}_{c}^{-} \rho \pi^{0}$	<	5.9	imes 10 ⁻⁴	CL=90%
Γ ₂₅₅	$\overline{\Lambda}_{c}^{-} p \pi^{+} \pi^{-} \pi^{0}$	<	5.07	imes 10 ⁻³	CL=90%
Γ ₂₅₆	$\overline{\Lambda}_{c}^{c} p \pi^{+} \pi^{-} \pi^{+} \pi^{-}$	<	2.74	imes 10 ⁻³	CL=90%
Γ ₂₅₇	$\overline{\Sigma}_{c}(2520)^{}p\pi^{+}$	($1.6~\pm~0.7$)	$) \times 10^{-4}$	
Γ_{258}	$\overline{\Sigma}_{c}(2520)^{0} p \pi^{-}$	<	1.21	imes 10 ⁻⁴	CL=90%
Γ ₂₅₉	$\overline{\Sigma}_{c}(2455)^{0}p\pi^{-}$	(10 ± 8)	$) imes 10^{-5}$	S=1.7
Γ ₂₆₀	$\overline{\Sigma}_{c}(2455)^{}p\pi^{+}$	(2.8 ± 0.9)	10^{-4}	
Г ₂₆₁	$\overline{\Lambda}_c(2593)^- / \overline{\Lambda}_c(2625)^- p$	<	1.1	$ imes 10^{-4}$	CL=90%

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

Γ ₂₆₂	$\gamma \gamma$	B1	< 1.7	imes 10 ⁻⁶	CL=90%
Γ ₂₆₃	e ⁺ e ⁻	B1	< 1.9	imes 10 ⁻⁷	CL=90%
Г ₂₆₄	$\mu^+\mu^-$	B1	< 1.5	imes 10 ⁻⁷	CL=90%
Γ ₂₆₅	$K^0 e^+ e^-$	B1	< 5.4	imes 10 ⁻⁷	CL=90%
Г ₂₆₆	$K^0 \mu^+ \mu^-$	B1	(2.0 + 1.)	$^{3}_{0}$) $ imes$ 10 $^{-7}$	S=1.6

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Г ₂₆₇	$K^0 \ell^+ \ell^-$	B1	[a] <	6.8	imes 10 ⁻⁷	CL=90%
Г ₂₆₈	K*(892) ⁰ e ⁺ e ⁻	B1	<	2.4	imes 10 ⁻⁶	CL=90%
Г ₂₆₉	$K^{*}(892)^{0}\mu^{+}\mu^{-}$	B1	(1.22^+_{-} 0.32	$(3) \times 10^{-6}$	
Γ ₂₇₀	$K^{*}(892)^{0} \nu \overline{\nu}$	B1	<	1.0	imes 10 ⁻³	CL=90%
Γ ₂₇₁	$K^*(892)^0 \ell^+ \ell^-$	B1	[a] ($1.17\pm$ 0.30	$) \times 10^{-6}$	
Γ ₂₇₂	$e^{\pm}\mu^{\mp}$	LF	[d] <	1.7	imes 10 ⁻⁷	CL=90%
Γ ₂₇₃	${\cal K}^{0}e^{\pm}\mu^{\mp}$	LF	<	4.0	imes 10 ⁻⁶	CL=90%
Γ ₂₇₄	${\it K}^{*}(892)^{0}e^{\pm}\mu^{\mp}$	LF	<	3.4	imes 10 ⁻⁶	CL=90%
Г ₂₇₅	$e^{\pm} au^{\mp}$	LF	[d] <	1.1	imes 10 ⁻⁴	CL=90%
Γ ₂₇₆	$\mu^{\pm} \tau^{\mp}$	LF	[d] <	3.8	imes 10 ⁻⁵	CL=90%
Γ ₂₇₇	invisible	B1	<	2.2	imes 10 ⁻⁴	CL=90%
Γ ₂₇₈	$ u \overline{ u} \gamma$	B1	<	4.7	imes 10 ⁻⁵	CL=90%

- [a] An ℓ indicates an e or a μ mode, not a sum over these modes.
- [b] Stands for the possible candidates of $K^*(1410)$, $K^*_0(1430)$ and $K_{2}^{*}(1430).$
- $[c] B^0$ and B^0_s contributions not separated. Limit is on weighted average of the two decay rates.
- [d] The value is for the sum of the charge states or particle/antiparticle states indicated.

B⁰ BRANCHING RATIOS

For branching ratios in which the charge of the decaying B is not determined, see the B^{\pm} section.

$\Gamma(\ell^+ \nu_\ell \text{ anything}) / \Gamma_{\text{total}}$						Γ_1/Γ
VALUE	DOCUMENT ID		TECN	<u>COMMENT</u>		
0.105 \pm 0.008 OUR AVERAGE						
$0.1078 \!\pm\! 0.0060 \!\pm\! 0.0069$	⁴⁶ ARTUSO	97	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$	
$0.093 \ \pm 0.011 \ \pm 0.015$	ALBRECHT	94	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$	
$0.099\ \pm 0.030\ \pm 0.009$	HENDERSON	92	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$	
$\bullet~\bullet~\bullet$ We do not use the following	g data for averages	, fits	, limits,	etc. • • •		
$0.109 \ \pm 0.007 \ \pm 0.011$	ATHANAS	94	CLE2	Sup. by AF	RTUSO	97

 46 ARTUSO 97 uses partial reconstruction of $B o D^* \ell
u_\ell$ and inclusive semileptonic branching ratio from BARISH 96B (0.1049 \pm 0.0017 \pm 0.0043).

$\frac{\Gamma(D^{-}\ell^{+}\nu_{\ell})}{\ell \text{ denotes } e \text{ or } \mu, \text{ not the sum.}}$

 Γ_2/Γ

"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 corrections between the measurements.

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VALUE	DOCUMENT ID		TECN	COMMENT
0.0212 ± 0.0020 OUR EVALUATI	ON			
$0.0213 \pm 0.0018 \text{ OUR AVERAGE}$				
$0.0213 \!\pm\! 0.0012 \!\pm\! 0.0039$	ABE	02E	BELL	$e^+e^- \rightarrow \Upsilon(4S)$
$0.0209 \!\pm\! 0.0013 \!\pm\! 0.0018$	⁴⁷ BARTELT	99	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
$0.0235 \!\pm\! 0.0020 \!\pm\! 0.0044$	⁴⁸ BUSKULIC	97	ALEP	$e^+e^- \rightarrow Z$
\bullet \bullet We do not use the followin	g data for averages	, fits,	, limits,	etc. • • •
$0.0187 \!\pm\! 0.0015 \!\pm\! 0.0032$	⁴⁹ ATHANAS	97	CLE2	Repl. by BARTELT 99
$0.018\ \pm 0.006\ \pm 0.003$	⁵⁰ FULTON	91	CLEO	$e^+e^- ightarrow ~\Upsilon(4S)$
$0.020 \ \pm 0.007 \ \pm 0.006$	⁵¹ ALBRECHT	8 9 J	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

⁴⁷ Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

⁴⁸ BUSKULIC 97 assumes fraction (B^+) = fraction (B^0) = (37.8 ± 2.2)% and PDG 96 values for *B* lifetime and branching ratio of D^* and *D* decays.

⁴⁹ ATHANAS 97 uses missing energy and missing momentum to reconstruct neutrino.

⁵⁰ FULTON 91 assumes assuming equal production of B^0 and B^+ at the $\Upsilon(4S)$ and uses Mark III D and D^* branching ratios.

⁵¹ALBRECHT 89J reports 0.018 \pm 0.006 \pm 0.005. We rescale using the method described in STONE 94 but with the updated PDG 94 B($D^0 \rightarrow K^- \pi^+$).

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

"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 corrections between the measurements.

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
0.0534 ± 0.0020 OUR EVAL	UATION			
0.0520 ± 0.0024 OUR AVER	RAGE E	rror includes scale fa	actor of 1.2.	
$0.0490 \pm 0.0007 {+0.0036 \atop -0.0035}$		⁵² AUBERT	05e BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$0.0590 \!\pm\! 0.0022 \!\pm\! 0.0050$		⁵² ABDALLAH	04D DLPH	$e^+e^- \rightarrow Z^0$
$0.0609\!\pm\!0.0019\!\pm\!0.0040$		⁵³ ADAM	03 CLE2	$e^+e^- ightarrow ~\Upsilon(4S)$
$0.0459\!\pm\!0.0023\!\pm\!0.0040$		⁵⁴ ABE	02F BELL	$e^+e^- ightarrow ~\Upsilon(4S)$
$0.0470 \!\pm\! 0.0013 \!+\! 0.0036 \\ -\! 0.0031$		⁵⁵ ABREU	01H DLPH	$e^+e^- \rightarrow Z$
$0.0526 \!\pm\! 0.0020 \!\pm\! 0.0046$		⁵⁶ ABBIENDI	00Q OPAL	$e^+e^- \rightarrow Z$
$0.0553 \!\pm\! 0.0026 \!\pm\! 0.0052$		⁵⁷ BUSKULIC	97 ALEP	$e^+e^- \rightarrow Z$
$\bullet \bullet \bullet$ We do not use the fo	ollowing d	ata for averages, fit	s, limits, etc	. • • •
$0.0539 \!\pm\! 0.0011 \!\pm\! 0.0034$		⁵⁸ ABDALLAH	04D DLPH	$e^+e^- \rightarrow Z^0$
$0.0609 \pm 0.0019 \pm 0.0040$		⁵⁹ BRIERE	02 CLE2	$e^+e^- ightarrow ~\Upsilon(4S)$
$0.0508 \pm 0.0021 \pm 0.0066$		⁶⁰ ACKERSTAFF	97g OPAL	Repl. by ABBI- FNDI 000
$0.0552 \!\pm\! 0.0017 \!\pm\! 0.0068$		⁶¹ ABREU	96p DLPH	Repl. by
$0.0449 \!\pm\! 0.0032 \!\pm\! 0.0039$	376	⁶² BARISH	95 CLE2	Repl. by ADAM 03
$0.0518 \!\pm\! 0.0030 \!\pm\! 0.0062$	410	⁶³ BUSKULIC	95N ALEP	Sup. by
$0.045 \pm 0.003 \pm 0.004$		⁶⁴ ALBRECHT	94 ARG	$e^+e^- \rightarrow \Upsilon(4S)$

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 Γ_3/Γ

0.047	± 0.005	± 0.005	235	⁶⁵ ALBRECHT	93	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
seen			398	⁶⁶ SANGHERA	93	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
0.070	± 0.018	± 0.014		⁶⁷ ANTREASYAN	90 B	CBAL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
				⁶⁸ ALBRECHT	89 C	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
0.060	±0.010	± 0.014		⁶⁹ ALBRECHT	89J	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
0.040	± 0.004	± 0.006		⁷⁰ BORTOLETTC	89 В	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
0.070	± 0.012	± 0.019	47	⁷¹ ALBRECHT	87J	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$

⁵² Measured using fully reconstructed D^* sample.

⁵³Uses the combined fit of both $B^0 \to D^*(2010)^- \ell \nu$ and $B^+ \to \overline{D}(2007)^0 \ell \nu$ samples. ⁵⁴Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

⁵⁵ABREU 01H measured using about 5000 partial reconstructed D^* sample.

⁵⁶ABBIENDI 00Q assumes the fraction $B(b \rightarrow B^0) = (39.7^{+1.8}_{-2.2})\%$. This result is an average of two methods using exclusive and partial D^* reconstruction.

⁵⁷ BUSKULIC 97 assumes fraction (B^+) = fraction (B^0) = (37.8 ± 2.2)% and PDG 96 values for *B* lifetime and *D*^{*} and *D* branching fractions.

 58 Combines with previous partial reconstructed D^* measurement.

- ⁵⁹ The results are based on the same analysis and data sample reported in ADAM 03. ⁶⁰ ACKERSTAFF 97G assumes fraction (B^+) = fraction $(B^0) = (37.8 \pm 2.2)\%$ and PDG 96 values for *B* lifetime and branching ratio of D^* and *D* decays.
- ⁶¹ABREU 96P result is the average of two methods using exclusive and partial D^* reconstruction.
- ⁶² BARISH 95 use B($D^0 \rightarrow K^- \pi^+$) = (3.91 ± 0.08 ± 0.17)% and B($D^{*+} \rightarrow D^0 \pi^+$) = (68.1 ± 1.0 ± 1.3)%.

⁶³ BUSKULIC 95N assumes fraction (B^+) = fraction (B^0) = 38.2 ± 1.3 ± 2.2% and τ_{B^0} = 1.58 ± 0.06 ps. $\Gamma(D^{*-}\ell^+\nu_{\ell})/\text{total}$ = [5.18 - 0.13(fraction(B^0)-38.2)-1.5(τ_{B^0} - 1.58)]%.

- ⁶⁴ ALBRECHT 94 assumes $B(D^{*+} \rightarrow D^0 \pi^+) = 68.1 \pm 1.0 \pm 1.3\%$. Uses partial reconstruction of D^{*+} and is independent of D^0 branching ratios.
- ⁶⁵ ALBRECHT 93 reports $0.052 \pm 0.005 \pm 0.006$. We rescale using the method described in STONE 94 but with the updated PDG 94 B($D^0 \rightarrow K^- \pi^+$). We have taken their average e and μ value. They also obtain $\alpha = 2*\Gamma^0/(\Gamma^- + \Gamma^+) - 1 = 1.1 \pm 0.4 \pm 0.2$, $A_{AF} = 3/4*(\Gamma^- - \Gamma^+)/\Gamma = 0.2 \pm 0.08 \pm 0.06$ and a value of $|V_{cb}| = 0.036-0.045$ depending on model assumptions.
- ⁶⁶ 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.
- ⁶⁷ ANTREASYAN 90B is average over B and \overline{D}^* (2010) charge states.
- ⁶⁸ The measurement of ALBRECHT 89C suggests a D^* polarization γ_L/γ_T of 0.85 ± 0.45. or $\alpha = 0.7 \pm 0.9$.

⁶⁹ ALBRECHT 89J is ALBRECHT 87J value rescaled using $B(D^*(2010)^- \rightarrow D^0 \pi^-) = 0.57 \pm 0.04 \pm 0.04$. Superseded by ALBRECHT 93.

- ⁷⁰ We have taken average of the the BORTOLETTO 89B values for electrons and muons, 0.046 \pm 0.005 \pm 0.007. We rescale using the method described in STONE 94 but with the updated PDG 94 B($D^0 \rightarrow K^- \pi^+$). The measurement suggests a D^* polarization parameter value $\alpha = 0.65 \pm 0.66 \pm 0.25$.
- ⁷¹ ALBRECHT 87J assume μ -e universality, the B($\Upsilon(4S) \rightarrow B^0 \overline{B}^0$) = 0.45, the B($D^0 \rightarrow K^- \pi^+$) = (0.042 ± 0.004 ± 0.004), and the B($D^*(2010)^- \rightarrow D^0 \pi^-$) = 0.49 ± 0.08. Superseded by ALBRECHT 89J.

$\Gamma(\rho^{-}\ell^{+}\nu_{\ell})/\Gamma_{\text{total}}$ $\ell = e \text{ or } \mu, \text{ not}$	sum over e	e and μ modes.				Г₄/Г
VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT	
2.6 \pm 0.7 OUR AV	/ERAGE					
$2.17 {\pm} 0.34 {+} {0.62 \atop -0.68}$		⁷² ATHAR	03	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$	
$3.29\!\pm\!0.42\!\pm\!0.72$		⁷³ AUBERT	03E	BABR	$e^+e^- \rightarrow \Upsilon(4S)$	
$2.57 \!\pm\! 0.29 \!+\! 0.53 \!-\! 0.62$		⁷⁴ BEHRENS	00	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$	
• • • We do not use	the followir	ng data for averages	s, fits	, limits,	etc. • • •	
$2.69 \!\pm\! 0.41 \!+\! 0.61 \\ -\! 0.64$		⁷⁵ BEHRENS	00	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$	
$2.5 \ \pm 0.4 \ \begin{array}{c} +0.7 \\ -0.9 \end{array}$		⁷⁶ ALEXANDER	9 6⊤	CLE2	Repl. by BEHREN	IS 00
<4.1	90	77 BEAN	93 B	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$	

 72 ATHAR 03 reports systematic errors $^{+0.47}_{-0.5}\pm0.41\pm0.01$, which are experimental systematic, systematic due to residual form-factor uncertainties in the signal, and systematic due to residual form-factor uncertainties in the cross-feed modes, respectively. We combine these in quadrature.

⁷³ Uses isospin constraints and extrapolation to all electron energies according to five different form-factor calculations. The second error combines the systematic and theoretical uncertainties in quadrature.

⁷⁴ Averaging with ALEXANDER 96T results including experimental and theoretical correlations considered, BEHRENS 00 reports systematic errors $\substack{+0.33 \\ -0.46} \pm 0.41$, where the second error is theoretical model dependence. We combine these in quadrature. ⁷⁵ BEHRENS 00 reports $\substack{+0.35 \\ -0.40} \pm 0.50$, where the second error is the theoretical model

⁷⁵ BEHRENS 00 reports $^{+0.39}_{-0.40} \pm 0.50$, where the second error is the theoretical model dependence. We combine these in quadrature. B^+ and B^0 decays combined using isospin symmetry: $\Gamma(B^0 \to \rho^- \ell^+ \nu) = 2\Gamma(B^+ \to \rho^0 \ell^+ \nu) \approx 2\Gamma(B^+ \to \omega \ell^+ \nu)$. No evidence for $\omega \ell \nu$ is reported.

⁷⁶ ALEXANDER 96T reports $^{+0.5}_{-0.7} \pm 0.5$ where the second error is the theoretical model dependence. We combine these in quadrature. B^+ and B^0 decays combined using isospin symmetry: $\Gamma(B^0 \to \rho^- \ell^+ \nu) = 2\Gamma(B^+ \to \rho^0 \ell^+ \nu) \approx 2\Gamma(B^+ \to \omega \ell^+ \nu)$. No evidence for $\omega \ell \nu$ is reported.

⁷⁷ BEAN 93B limit set using ISGW Model. Using isospin and the quark model to combine $\Gamma(\rho^0 \ell^+ \nu_\ell)$ and $\Gamma(\omega \ell^+ \nu_\ell)$ with this result, they obtain a limit $<(1.6-2.7) \times 10^{-4}$ at 90% CL for $B^+ \rightarrow (\omega \text{ or } \rho^0) \ell^+ \nu_\ell$. The range corresponds to the ISGW, WSB, and KS models. An upper limit on $|V_{ub}/V_{cb}| < 0.08-0.13$ at 90% CL is derived as well.

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

 Γ_5/Γ

VALUE (units 10 ⁻⁴)	DOCUMENT ID	TECN	COMMENT
$1.33 \pm 0.18 \pm 0.13$	78 ATHAR 03	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the follow	ving data for averages, fi	ts, limits,	etc. • • •

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1.8 \ \pm 0.4 \ \pm 0.4
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 78 ATHAR 03 reports systematic errors $0.11\pm0.01\pm0.07$, which are experimental systematic, systematic due to residual form-factor uncertainties in the signal, and systematic due to residual form-factor uncertainties in the cross-feed modes, respectively. We combine

⁷⁹ ALEXANDER 96T CLE2 Repl. by ATHAR 03

these in quadrature.

⁷⁹ ALEXANDER 96T gives systematic errors $\pm 0.3 \pm 0.2$ where the second error reflects the estimated model dependence. We combine these in quadrature. Assumes isospin symmetry: $\Gamma(B^0 \rightarrow \pi^- \ell^+ \nu) = 2 \times \Gamma(B^+ \rightarrow \pi^0 \ell^+ \nu)$.

$\Gamma(\pi^{-}\mu^{+}\nu_{\mu})/\Gamma_{total}$						Г ₆ /Г
VALUE		DOCUMENT ID		TECN		
$\bullet \bullet \bullet$ We do not use the f	ollowing	data for average	s, fits,	limits,	etc. • • •	
seen	8	⁰ ALBRECHT	91C A	ARG		
⁸⁰ In ALBRECHT 91C, or transition.	ne event i	s fully reconstru	icted pi	rovidin	g evidence f	for the $b \rightarrow u$
$\Gamma(K^{\pm} \text{ anything})/\Gamma_{\text{total}}$		DOCUMENT ID		TECN	COMMENT	Γ ₇ /Γ
0 78 + 0 08	8	1 ALBRECHT		ARC		$\Upsilon(\Lambda S)$
⁸¹ Average multiplicity.		ALDIVECTI	900 P		e e —	7 (43)
$\Gamma(D^0 X) / \Gamma_{\text{total}}$						Г ₈ /Г
VALUE		DOCUMENT ID	1	TECN	COMMENT	
$0.063 \pm 0.019 \pm 0.005$	8.	← AUBERT,BE	04B E	BABR	$e^+e^- \rightarrow$	T(4S)
⁸² Events are selected by charmed particle in the branching ratio uncerta	completel e rest of t ainties.	y reconstructing he event. The I	; one <i>B</i> ast erro	and se or inclu	earchingfor a Ides systema	reconstructed atic and charm
$\Gamma(\overline{D}^0 X) / \Gamma_{\text{total}}$		DOCUMENT ID		TECN	COMMENT	٦/و٦
<u>VALUE</u>	8	3 AUDEDT DE			\pm –	22(4.6)
⁸³ Events are selected by charmed particle in the branching ratio uncerta $\Gamma(D^0 X) / [\Gamma(D^0 X) +$	completel e rest of t ainties.	y reconstructing he event. The l	; one <i>B</i> ast erro	and se or inclu	earchingfor a Ides systema	reconstructed atic and charm $\Gamma_0/(\Gamma_0+\Gamma_0)$
		DOCLIMENT ID	-	TECN	COMMENT	. 9/ (. 9 3)
0.110±0.031±0.008		AUBERT,BE	04B E	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\Gamma(D^+X)/\Gamma_{total}$						Γ10/Γ
VALUE	CL%_	DOCUMENT ID				
		DOCUMENT ID	1	TECN	<u>COMMENT</u>	107
<0.051	90 ^{8,}	⁴ AUBERT,BE	<u></u> 04в Е	<i>tecn</i> BABR	$\frac{COMMENT}{e^+e^-} \rightarrow$	τ(4 <i>S</i>)
<0.051 99 84 Events are selected by charmed particle in the branching ratio uncerta	90 ^{8.} completel e rest of t ainties.	⁴ AUBERT,BE y reconstructing he event. The I	04B E ; one <i>B</i> ast erro	<u>TECN</u> BABR and se or inclu	$\frac{COMMENT}{e^+e^-} \rightarrow$ earchingfor and es systematic	$\Upsilon(4S)$ a reconstructed atic and charm
<0.051 ⁸⁴ Events are selected by charmed particle in the branching ratio uncerta $\Gamma(D^-X)/\Gamma_{total}$ VALUE	90 ^{8.} completel e rest of t ainties.	4 AUBERT,BE y reconstructing he event. The l	04B [g one <i>B</i> ast erro	<u>TECN</u> BABR and se or inclu <u>TECN</u>	$\frac{COMMENT}{e^+e^-} \rightarrow$ earchingfor a des systema	$\Upsilon(4S)$ a reconstructed atic and charm Γ_{11}/Γ
<0.051 9 84 Events are selected by charmed particle in the branching ratio uncerta $\Gamma(D^-X)/\Gamma_{total}$ <u>VALUE</u> 0.397±0.030+0.040 -0.038	90 ^{8.} completel e rest of t ainties. 	⁴ AUBERT,BE y reconstructing he event. The l <u>DOCUMENT ID</u> ⁵ AUBERT,BE	04B E g one <i>B</i> ast erro	TECN 3ABR and se or inclu TECN 3ABR	$\frac{COMMENT}{e^+e^-} \rightarrow$ earchingfor a ides systema $\frac{COMMENT}{e^+e^-} \rightarrow$	$\Upsilon(4S)$ a reconstructed atic and charm Γ_{11}/Γ $\Upsilon(4S)$
<0.051 ⁸⁴ Events are selected by charmed particle in the branching ratio uncerta $\Gamma(D^-X)/\Gamma_{total}$ <u>VALUE</u> 0.397±0.030+0.040 -0.038 ⁸⁵ Events are selected by charmed particle in the branching ratio uncerta	90 8. completel e rest of t ainties. 81 completel e rest of t ainties.	⁴ AUBERT,BE y reconstructing he event. The l <u>DOCUMENT ID</u> ⁵ AUBERT,BE y reconstructing he event. The l	04B E g one <i>B</i> ast erro 04B E g one <i>B</i> ast erro	TECN BABR and se or inclu TECN BABR and se or inclu	$\frac{COMMENT}{e^+e^-} \rightarrow$ earchingfor a des systema $\frac{COMMENT}{e^+e^-} \rightarrow$ earchingfor a des systema	$\Upsilon(4S)$ a reconstructed atic and charm Γ_{11}/Γ $\Upsilon(4S)$ a reconstructed atic and charm
<0.051 ⁸⁴ Events are selected by charmed particle in the branching ratio uncerta $\Gamma(D^-X)/\Gamma_{total}$ <u>VALUE</u> 0.397±0.030+0.040 0.397±0.030+0.040 selected by charmed particle in the branching ratio uncerta $\Gamma(D^+X)/[\Gamma(D^+X) + V]$	90 8 completel e rest of t ainties. 8! completel e rest of t ainties. - Γ(D [−])	AUBERT,BE y reconstructing the event. The l <u>DOCUMENT ID</u> 5 AUBERT,BE y reconstructing he event. The l X)]	04B E g one <i>B</i> last erro 04B E g one <i>B</i> ast erro	TECN 3ABR and se or inclu TECN 3ABR and se or inclu	$\frac{COMMENT}{e^+e^-} \rightarrow$ earchingfor a ides systema $\frac{COMMENT}{e^+e^-} \rightarrow$ earchingfor a ides systema Γ_{10}	$\frac{\gamma(4S)}{\Gamma_{11}/\Gamma}$ $\frac{\Gamma_{11}}{\Gamma(4S)}$ a reconstructed atic and charm
<0.051 ⁸⁴ Events are selected by charmed particle in the branching ratio uncerta $\Gamma(D^-X)/\Gamma_{total}$ <u>VALUE</u> 0.397±0.030 ^{+0.040} 0.397±0.030 ^{+0.040} 0.397±0.030 ^{+0.040} charmed particle in the branching ratio uncerta $\Gamma(D^+X)/[\Gamma(D^+X) + V_{ALUE}]$	90 8. completel e rest of t ainties. 81 completel e rest of t ainties. - Γ(D [−])	AUBERT,BE y reconstructing the event. The l <u>DOCUMENT ID</u> AUBERT,BE y reconstructing the event. The l <u>DOCUMENT ID</u>	04B E g one <i>B</i> last erro 04B E g one <i>B</i> last erro	TECN BABR and se or inclu BABR and se or inclu TECN	$\frac{COMMENT}{e^+e^-} \rightarrow$ earchingfor a ides systema $\frac{COMMENT}{e^+e^-} \rightarrow$ earchingfor a ides systema Γ_{10} $\frac{COMMENT}{e^+e^-} \rightarrow$	$\frac{\gamma(4S)}{\Gamma_{11}/\Gamma}$ $\frac{\Gamma_{11}}{\Gamma(4S)}$ a reconstructed atic and charm $\frac{\gamma(4S)}{\Gamma(4S)}$

$\Gamma(D_{s}^{+}X)/\Gamma_{total}$						Г ₁₂ /Г
VALUE		DOCUMENT ID		TECN	<u>COMMENT</u>	
$0.109 \pm 0.021 \substack{+0.039 \\ -0.024}$		⁸⁶ AUBERT,BE	0 4B	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
⁸⁶ Events are selected b charmed particle in t branching ratio uncer	y compl he rest rtainties	etely reconstructing of the event. The la	one l ast er	3 and se ror inclu	earchingfor a Ides systema	reconstructed atic and charm
$\Gamma(D_s^- X)/\Gamma_{\text{total}}$				TECN	COMMENT	Г ₁₃ /Г
<u>VALUE</u>	<u>CL%</u>	87 AURERT DE	040		$\frac{COMMENT}{2}$	$\Upsilon(AE)$
87	90	AUBERT, BE	048	БАВК	e'e →	7 (45)
charmed particle in t branching ratio uncer	y compl he rest rtainties	etely reconstructing of the event. The la	one <i>l</i> ast er	and se ror inclu	archingfor a ides systema	a reconstructed atic and charm
$\Gamma(D_{c}^{+}X)/[\Gamma(D_{c}^{+}X)]$	$+\Gamma(L$	$[\mathbf{x}_{-}]$			Γ ₁₂	$p/(\Gamma_{12}+\Gamma_{13})$
VALUE		DOCUMENT ID		TECN	<u>COMMENT</u>	
0.733±0.092±0.010		AUBERT,BE	0 4B	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\Gamma(\Lambda_c^+ X) / \Gamma_{\text{total}}$	C: 4(Г ₁₄ /Г
VALUE	<u>CL%</u>	BRANDEDT DE		TECN	$\underline{COMMENT}$	22(1.5)
^{oo} Events are selected b charmed particle in t branching ratio uncer $\Gamma(\overline{\Lambda}_{c}^{-}X)/\Gamma_{total}$	y compl he rest rtainties	etely reconstructing of the event. The la 	one <i>l</i> ast er	3 and se ror inclu	earchingfor a ides systema	reconstructed atic and charm Γ ₁₅ /Γ
VALUE		DOCUMENT ID		TECN	<u>COMMENT</u>	
$0.049 \pm 0.017 \substack{+0.018 \\ -0.011}$		⁸⁹ AUBERT,BE	04 B	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
⁸⁹ Events are selected b charmed particle in t branching ratio uncer	y compl he rest rtainties	etely reconstructing of the event. The la	one <i>l</i> ast er	3 and se ror inclu	earchingfor a ides systema	a reconstructed atic and charm
$\frac{\Gamma(\Lambda_c^+ X)}{\Gamma(\Lambda_c^+ X)} - \frac{\Gamma(\Lambda_c^+ X)}{\Gamma(\Lambda_c^+ X)} - $	+ Γ(<u>Λ</u> -	TAD		TECN	Γ ₁₄	μ/(Γ ₁₄ +Γ ₁₅)
0.286±0.142±0.007		AUBERT,BE	0 4B	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\Gamma(\overline{c}X)/\Gamma_{total}$		DOCUMENT ID		TECN	COMMENT	Г ₁₆ /Г
$1.039 \pm 0.051 + 0.063$		⁹⁰ AUBERT, BE	04в	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
⁹⁰ Events are selected b charmed particle in t	y compl he rest	etely reconstructing of the event. The la	one <i>l</i> ast er	3 and se ror inclu	earchingfor a Ides systema	reconstructed atic and charm

branching ratio uncertainties.

$\Gamma(cX)/\Gamma_{total}$				Г ₁₇ /Г
VALUE	DOCUMENT ID	TECN	<u>COMMENT</u>	
$0.237 {\pm} 0.036 {+} 0.041 {-} 0.027$	⁹¹ AUBERT,BE	04b BABR	$e^+e^- ightarrow$	$\Upsilon(4S)$

⁹¹ Events are selected by completely reconstructing one B and searchingfor a reconstructed charmed particle in the rest of the event. The last error includes systematic and charm branching ratio uncertainties.

$\Gamma(\overline{c}cX)/\Gamma_{total}$				Г ₁₈ /Г
VALUE	DOCUMENT ID	TECN	COMMENT	
$1.276 \pm 0.062 \substack{+0.088 \\ -0.074}$	⁹² AUBERT,BE	04b BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$

 92 Events are selected by completely reconstructing one *B* and searchingfor a reconstructed charmed particle in the rest of the event. The last error includes systematic and charm branching ratio uncertainties.

$\Gamma(D^-\pi^+)/\Gamma_{ m total}$						Г ₁₉ /Г
VALUE EV	<u>'TS</u>	DOCUMENT ID		TECN	COMMENT	
0.00287 ± 0.00019 OUR AVERA	GE					
$0.00302 \pm 0.00022 \pm 0.00020$	93,94	AUBERT,B	040	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$0.00268 \pm 0.00012 \pm 0.00024$	94,95	AHMED	0 2B	CLE2	$e^+e^- ightarrow$	$\Upsilon(4S)$
$0.0027 \ \pm 0.0006 \ \pm 0.0005$	96	BORTOLETTO	092	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$0.0048 \ \pm 0.0011 \ \pm 0.0011$	22 97	ALBRECHT	90J	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	4 98	BEBEK	87	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\bullet \bullet \bullet$ We do not use the follow	ing data	for averages, fits	s, lin	nits, etc.	• • •	
$0.0029 \ \pm 0.0004 \ \pm 0.0002$	81 99	ALAM	94	CLE2	Repl. by) በ2B
$0.0031 \ \pm 0.0013 \ \pm 0.0010$	7 97	ALBRECHT	88K	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
⁹³ AUBERT,B 040 reports $[B(B^0 \rightarrow D^- \pi^+) \times B(D^+ \rightarrow \overline{K}^0 \pi^+)] = (85.4 \pm 4.2 \pm 4.4) \times 10^{-6}$. We divide by our best value $B(D^+ \rightarrow \overline{K}^0 \pi^+) = (2.83 \pm 0.18) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error form union.						
⁹⁴ Assumes equal production of	of B^+ and	d B^0 at the $\Upsilon(A)$	4 <i>S</i>).			
⁹⁵ AHMED 02B reports an ad	ditional u	uncertainty on t	he b	ranching	ratios to a	ccount for
4.5% uncertainty on relative	e product	ion of B^0 and E	3+. \	which is	not include	d here.
⁹⁶ BORTOLETTO 92 assume	s equal p	production of B^{-}	+ ar	$d B^0 a$	t the $\Upsilon(4S)$) and uses
Mark III branching fractions	for the L	D.				,
⁹⁷ ALBRECHT 88K assumes E	$3^{0}\overline{B}^{0}:B^{+}$	B^{-} production	n rati	o is 45:5	55. Supersed	led by AL-
BRECHT 901 which assume		•				2

⁹⁸ BEBEK 87 value has been updated in BERKELMAN 91 to use same assumptions as noted for BORTOLETTO 92. ⁹⁹ ALAM 94 reports $[B(B^0 \rightarrow D^-\pi^+) \times B(D^+ \rightarrow K^-\pi^+\pi^+)] = 0.000265 \pm$

⁹⁹ ALAM 94 reports $[B(B^{0} \rightarrow D^{-}\pi^{+}) \times B(D^{+} \rightarrow K^{-}\pi^{+}\pi^{+})] = 0.000265 \pm 0.000032 \pm 0.000023$. We divide by our best value $B(D^{+} \rightarrow K^{-}\pi^{+}\pi^{+}) = (9.2 \pm 0.6) \times 10^{-2}$. 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 $\Upsilon(4S)$.

HTTP://PDG.LBL.GOV

Citation: S. Eidelman et al. (Particle Data Group), Phys. Lett. B 592, 1 (2004) and 2005 partial update for edition 2006 (URL: http://pdg.lbl.gov)

$\Gamma(D^- ho^+)/\Gamma_{ m total}$				Г ₂₀ /Г
VALUE	<u>DOCUMENT</u>	ID <u>TEC</u>	<u>COMME</u>	NT
0.0077 ± 0.0013 OUR AVERAGE	100		- <u> </u>	22(1.5)
$0.0076 \pm 0.0013 \pm 0.0005$ 7	9 100 ALAM	94 CLE	=2 e'e	$\rightarrow I(4S)$
$0.009 \pm 0.005 \pm 0.003$	9 IOI ALBRECHI	90J AR	G e'e	$\rightarrow I(4S)$
• • • We do not use the following	101	, fits, limits,		
$0.022 \pm 0.012 \pm 0.009$	6 ¹⁰¹ ALBRECHT	- 88k AR	G e ⁺ e ⁻	$\rightarrow ~\Upsilon(4S)$
¹⁰⁰ ALAM 94 reports $[B(B^0 - 0.000096 \pm 0.000070]$. W (9.2 ± 0.6) × 10 ⁻² . Our f is the systematic error from B^0 at the $\Upsilon(4S)$. ¹⁰¹ ALBRECHT 88K assumes B BRECHT 90J which assumes	$\rightarrow D^{-}\rho^{+}) \times B(L)$ e divide by our be first error is their ex using our best value. $0 \overline{B}^{0}: B^{+}B^{-} \text{ product}$ is 50:50.	$D^+ \rightarrow K^-$ st value B(periment's e Assumes eq tion ratio is	$[\pi^+ \pi^+,\pi^+)] = D^+ \rightarrow K$ rror and ou ual production 45:55. Superior	$= 0.000704 \pm (\pi - \pi^{+} \pi^{+}) =$ r second error ion of B^{+} and erseded by AL-
$\Gamma(D^-K^*(892)^+)/\Gamma_{total}$				Г ₂₁ /Г
VALUE	DOCUMENT ID	TECN	COMMENT	
$(3.7\pm1.5\pm1.0) imes 10^{-4}$	¹⁰² MAHAPATRA	02 CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
102 Assumes equal production of	f B^+ and B^0 at the	$\Upsilon(4S).$		
				F /F
$\left(D \ \omega \pi \right) / \left[\text{total} \right]$		TECH	CONTRACT	1 22/1
	103 ALEXANDED		$\underline{COMMENI}$	22(4.6)
$0.0028 \pm 0.0005 \pm 0.0004$	ALEXANDER	01B CLE2	$e^+ e^- \rightarrow$	T(4S)
all observed $\omega \pi^+$ having production of $\omega \pi^+$ having production of $\omega \pi^+$ having production of $\omega \pi^+$ having $\omega \pi^+$	boceeded through the 46 MeV.	ρ'^+ resonand	ce at mass 1	$349 \pm 25^{+10}_{-5}$
$\Gamma(D^-K^+)/\Gamma_{\text{total}}$				Г ₂₃ /Г
VALUE	DOCUMENT ID	TECN	<u>COMMENT</u>	
$(2.04\pm0.50\pm0.27) imes 10^{-4}$	¹⁰⁴ ABE	01I BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
¹⁰⁴ ABE 011 reports $B(B^0 \rightarrow E)$ multiply by our best value I is their experiment's error and value.	$(D^- K^+)/B(B^0 \rightarrow B^-)$ $(B^0 \rightarrow D^- \pi^+) =$ and the second error i	$(3.0 \pm 0.4) = 0.4$ s systematic	068 ± 0.015) $ imes$ 10^{-3} . error from	$5\pm$ 0.007. We Our first error using our best
$\Gamma(D^- K^+ \overline{K}^0) / \Gamma_{\text{total}}$				Г24/Г
$VALUE$ (units 10^{-4}) CL%	DOCUMENT ID	TECN	COMMENT	,
< <u> </u>		02 BELL		$\Upsilon(\Lambda S)$
			e e →	7 (43)
Assumes equal production of	B and B at the	<i>I</i> (45).		
$\Gamma(D^- K^+ \overline{K}^* (892)^0) / \Gamma_{total}$				Г ₂₅ /Г
VALUE (units 10 ⁻⁴)	DOCUMENT ID	TECN	COMMENT	
$8.8 \pm 1.1 \pm 1.5$	¹⁰⁶ DRUTSKOY	02 BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
106 Assumes equal production of	f B^+ and B^0 at the	Υ(4S).		
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$\Gamma(\overline{D}^0\pi^+\pi^-$	⁻)/Γ _{total}						Г ₂₆ /Г
VALUE (units 10	0 ⁻⁴) <u>CL% E</u>	VTS	DOCUMENT ID		TECN	COMMENT	
8.0± 0	.6±1.5	107,10	⁾⁸ SATPATHY	03	BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
\bullet \bullet \bullet We do	not use the follow	ing data	for averages, fit	s, lim	its, etc.	• • •	
< 16	90	10	⁾⁷ ALAM	94	CLE2	$e^+ e^- \rightarrow$	$\Upsilon(4S)$
< 70	90	10	⁾⁹ BORTOLETT	092	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
<340	90	11	¹⁰ BEBEK	87	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
700 ± 500		5^{11}	¹ BEHRENDS	83	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
¹⁰⁷ Assumes e	equal production of	of B^+ and	nd B^0 at the $arphi($	4 <i>S</i>).			
¹⁰⁸ No assum	ption about the ir	ntermedi	ate mechanism is	s mad	le in the	analysis.	
¹⁰⁹ BORTOL	ETTO 92 assume	es equal	production of B	+ an	d B ⁰ at	the $\Upsilon(4S)$	and uses
Mark III b	ranching fractions	for the	D. The product	brand	ching fra	ction into D	*(2340)π
followed b	by $D^*_0(2340) \rightarrow l$	$D^0\pi$ is <	< 0.0001 at 90%	CL a	nd into	D*(2460) fo	ollowed by

 $D_2^*(2460) \rightarrow D^0 \pi \text{ is } < 0.0004 \text{ at } 90\% \text{ CL.}$

¹¹⁰ BEBEK 87 assume the $\Upsilon(4S)$ decays 43% to $B^0 \overline{B}^0$. We rescale to 50%. B($D^0 \rightarrow K^- \pi^+$) = (4.2 ± 0.4 ± 0.4)% and B($D^0 \rightarrow K^- \pi^+ \pi^+ \pi^-$) = (9.1 ± 0.8 ± 0.8)% were used.

¹¹¹Corrected by us using assumptions: $B(D^0 \rightarrow K^-\pi^+) = (0.042 \pm 0.006)$ and $B(\Upsilon(4S) \rightarrow B^0 \overline{B}{}^0) = 50\%$. The product branching ratio is $B(B^0 \rightarrow \overline{D}{}^0\pi^+\pi^-)B(\overline{D}{}^0\rightarrow K^+\pi^-) = (0.39 \pm 0.26) \times 10^{-2}$.

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

 Γ_{27}/Γ

VALUE	EVTS	<u>DOCUMENT ID</u>	TECN	<u>COMMENT</u>
0.00276±0.00021 OUR A	VERAGE			
$0.00281 \pm 0.00024 \pm 0.0000$)5	¹¹² BRANDENB	98 CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
$0.0026 \pm 0.0003 \pm 0.0004$	82	¹¹³ ALAM	94 CLE2	$e^+e^- ightarrow ~\Upsilon(4S)$
$0.00337 \pm 0.00096 \pm 0.0000$)2	¹¹⁴ BORTOLETTC	92 CLEO	$e^+e^- ightarrow ~\Upsilon(4S)$
$0.00236 \pm 0.00088 \pm 0.0000$)2 12	¹¹⁵ ALBRECHT	90J ARG	$e^+e^- ightarrow ~\Upsilon(4S)$
$0.00236^{+0.00150}_{-0.00110}\pm 0.0000$	02 5	¹¹⁶ BEBEK	87 CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
\bullet \bullet \bullet We do not use the f	ollowing	data for averages, fits	s, limits, etc.	• • •
$0.010 \pm 0.004 \pm 0.001$	8	¹¹⁷ AKERS	94J OPAL	$e^+e^- \rightarrow Z$
$0.0027 \pm 0.0014 \pm 0.0010$) 5	¹¹⁸ ALBRECHT	87c ARG	$e^+e^- ightarrow ~\Upsilon(4S)$
$0.0035\ \pm 0.002\ \ \pm 0.002$		¹¹⁹ ALBRECHT	86F ARG	$e^+e^- ightarrow ~\Upsilon(4S)$
$0.017 \pm 0.005 \pm 0.005$	41	¹²⁰ GILES	84 CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

¹¹² 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 $B(D^* \rightarrow D\pi)$.

¹¹³ 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($D^0 \rightarrow K^- \pi^+ \pi^+ \pi^-)/B(D^0 \rightarrow K^- \pi^+)$. ¹¹⁴ BORTOLETTO 92 reports 0.0040 \pm 0.0010 \pm 0.0007 for B($D^*(2010)^+ \rightarrow D^0 \pi^+$) = 0.57 \pm 0.06. 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 $\Upsilon(4S)$

error from using our best value. Assumes equal production of B^+ and uses Mark III branching fractions for the D.

¹¹⁵ ALBRECHT 90J reports $0.0028 \pm 0.0009 \pm 0.0006$ for B($D^*(2010)^+ \rightarrow D^0 \pi^+$) = 0.57 ± 0.06. We rescale to our best value B($D^*(2010)^+ \rightarrow D^0 \pi^+$) = (67.7 ± 0.5) ×

 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.

¹¹⁶ BEBEK 87 reports 0.0028 + 0.0015 + 0.0010 - 0.0006 for B($D^*(2010)^+ \rightarrow D^0 \pi^+$) = 0.57 ± 0.06. 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. Updated in BERKELMAN 91 to use same assumptions as noted for BORTOLETTO 92 and ALBRECHT 90J. ¹¹⁷ Assumes $B(Z \rightarrow b \overline{b}) = 0.217$ and 38% B_d production fraction.

¹¹⁸ 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 AL-BRECHT 90J.

¹¹⁹ALBRECHT 86F uses pseudomass that is independent of D^0 and D^+ branching ratios. ¹²⁰ Assumes $B(D^*(2010)^+ \rightarrow D^0 \pi^+) = 0.60^{+0.08}_{-0.15}$. Assumes $B(\Upsilon(4S) \rightarrow B^0 \overline{B}^0) =$

 0.40 ± 0.02 Does not depend on D branching ratios.

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

$$\xrightarrow{DOCUMENT ID} \xrightarrow{TECN} COMMENT$$

$$121 \text{ BORTOLETTO92 CLEO } e^{+}e^{-} \rightarrow \Upsilon(4S)$$

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

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

VALUE	<u>DOCUMENT ID</u>	TECN	<u>COMMENT</u>
$0.0039 \pm 0.0014 \pm 0.0013$	122 BORTOLETTO92	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

¹²²BORTOLETTO 92 assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$ and uses Mark III branching fractions for the D.

$\Gamma ig(D^- \pi^+ ho^{m 0} ig) / \Gamma_{ ext{total}}$				Г ₃₀ /Г
VALUE	DOCUMENT ID	TECN	<u>COMMENT</u>	
0.0011±0.0009±0.0004	123 BORTOLETTO92	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$

 123 BORTOLETTO 92 assumes equal production of B^+ and B^0 at the $\varUpsilon(4S)$ and uses Mark III branching fractions for the D.

$$\Gamma(D^-a_1(1260)^+)/\Gamma_{total}$$

VALUE	DOCUMENT ID	TECN	COMMENT	
0.0060±0.0022±0.0024	124 BORTOLETTO92	CLEO	$e^+e^- ightarrow \ \Upsilon(4S)$	
			-	

¹²⁴BORTOLETTO 92 assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$ and uses Mark III branching fractions for the D.

$\Gamma(D^*(2010)^-\pi^+\pi^0)/\Gamma$	total				Г ₃₂ /Г
VALUE	EVTS	DOCUMENT ID	TECN	COMMENT	
$0.0152 \pm 0.0052 \pm 0.0001$	51	¹²⁵ ALBRECHT	90j ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\bullet \bullet \bullet$ We do not use the fo	ollowing	data for averages, fit	s, limits, etc	. • • •	
$0.015 \pm 0.008 \pm 0.008$	8	¹²⁶ ALBRECHT	87c ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$

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 Γ_{28}/Γ

 Γ_{29}/Γ

 Γ_{31}/Γ

¹²⁵ ALBRECHT 90J reports $0.018 \pm 0.004 \pm 0.005$ for $B(D^*(2010)^+ \rightarrow D^0 \pi^+) = 0.57 \pm 0.06$. 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.

¹²⁶ 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 AL-BRECHT 90J.

Γ(<i>D</i> *((2010) [—] ($p^+)/\Gamma_{total}$							Г ₃₃ /Г
VALUE		E	VTS		DOCUMENT ID		TECN	COMMENT	
0.0068	± 0.0009	OUR AVER	AGE						
0.0068	± 0.0003	± 0.0009		127	CSORNA	03	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
0.0160	± 0.0113	± 0.0001		128	BORTOLETT	092	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
0.00589	0 ± 0.00352	2 ± 0.00004	19	129	ALBRECHT	90J	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
• • • \	Ne do not	use the follow	ving o	lata	for averages, fi	ts, lin	nits, etc.		
0.0074	± 0.0010	± 0.0014	78 ³⁰	,131	ALAM	94	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
0.081	± 0.029	$+0.059 \\ -0.024$	19	132	CHEN	85	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$

 127 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.

- ¹²⁸BORTOLETTO 92 reports $0.019 \pm 0.008 \pm 0.011$ for $B(D^*(2010)^+ \rightarrow D^0 \pi^+) = 0.57 \pm 0.06$. 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.
- ¹²⁹ ALBRECHT 90J reports $0.007 \pm 0.003 \pm 0.003$ for $B(D^*(2010)^+ \rightarrow D^0 \pi^+) = 0.57 \pm 0.06$. 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.
- ¹³⁰ 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($D^0 \rightarrow K^- \pi^+ \pi^+ \pi^-$)/B($D^0 \rightarrow K^- \pi^+$).
- ¹³¹ This decay is nearly completely longitudinally polarized, $\Gamma_L/\Gamma = (93 \pm 5 \pm 5)\%$, as expected from the factorization hypothesis (ROSNER 90). The nonresonant $\pi^+ \pi^0$ contribution under the ρ^+ is less than 9% at 90% CL.
- ¹³²Uses B($D^* \rightarrow D^0 \pi^+$) = 0.6 ± 0.15 and B($\Upsilon(4S) \rightarrow B^0 \overline{B}^0$) = 0.4. Does not depend on D branching ratios.

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

Г₃₄/Г

VALUE	DOCUMENT ID	TECN	<u>COMMENT</u>
$(2.04\pm0.44\pm0.16)\times10^{-4}$	¹³³ ABE	01I BELL	$e^+e^- \rightarrow \Upsilon(4S)$
¹³³ ABE 011 reports B($B^0 \rightarrow$	$D^*(2010)^- K^+)/E$	$B(B^0 \rightarrow D)$	$(2010)^{-}\pi^{+})=0.074 \pm$
0.015 \pm 0.006. We multiply	y by our best value	$B(B^0 \rightarrow L)$	$D^*(2010)^-\pi^+)=(2.76\pm$
0.21) $ imes$ 10 ⁻³ . Our first erro	r is their experiment	's error and t	he second error is system-
atic error from using our bes	st value.		

Citation: S. Eidelman et al. (Particle Data Group), Phys. Lett. B 592, 1 (2004) and 2005 partial update for edition 2006 (URL: http://pdg.lbl.gov)

 $\Gamma(D^*(2010)^- K^*(892)^+)/\Gamma_{total}$ Γ_{35}/Γ VALUE DOCUMENT ID TECN COMMENT $(3.8\pm1.3\pm0.8)\times10^{-4}$ 134 MAHAPATRA 02 CLE2 $e^+e^-
ightarrow argama(4S)$ ¹³⁴ Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$ and an unpolarized final state. $\Gamma(D^*(2010)^- K^+ \overline{K}^0) / \Gamma_{\text{total}}$ Γ_{36}/Γ *VALUE* (units 10^{-4}) DOCUMENT ID TECN COMMENT CL% ¹³⁵ DRUTSKOY 02 BELL $e^+e^- \rightarrow \Upsilon(4S)$ 90 <4.7 ¹³⁵ Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. $\Gamma(D^{*}(2010)^{-}K^{+}\overline{K}^{*}(892)^{0})/\Gamma_{\text{total}}$ Γ_{37}/Γ VALUE (units 10^{-4} 136 DRUTSKOY $02 \quad \text{BELL} \quad e^+e^- \rightarrow \ \Upsilon(4S)$ $12.9 \pm 2.2 \pm 2.5$ ¹³⁶Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. $\Gamma(D^*(2010)^-\pi^+\pi^+\pi^-)/\Gamma_{\text{total}}$ Γ_{38}/Γ VALUE DOCUMENT ID TECN COMMENT 0.0070 ±0.0008 OUR AVERAGE Error includes scale factor of 1.3. See the ideogram below. ¹³⁷ MAJUMDER 04 BELL $e^+e^ \rightarrow \Upsilon(4S)$ $0.00681 \pm 0.00023 \pm 0.00072$ $0.0063 \ \pm 0.0010 \ \pm 0.0011 \ \ ^{138,139} \, \text{ALAM}$ 94 CLE2 e⁺ $\rightarrow \Upsilon(4S)$ ¹⁴⁰ BORTOLETTO92 CLEO $e^+e^- \rightarrow \Upsilon(4S)$ $0.0134 \ \pm 0.0036 \ \pm 0.0001$ ¹⁴¹ ALBRECHT $0.0101 \pm 0.0041 \pm 0.0001$ 90J ARG $e^+e^- \rightarrow$ $\Upsilon(4S)$ • • • We do not use the following data for averages, fits, limits, etc. • ¹⁴² ALBRECHT 87C ARG $0.033 \pm 0.009 \pm 0.016$ $e^+e^- \rightarrow \Upsilon(4S)$ ¹⁴³ BEBEK < 0.042 90 87 CLEO $e^+e^- \rightarrow \Upsilon(4S)$ ¹³⁷ Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. 138 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 $B(D^0 \rightarrow K^- \pi^+)$ $K^{-}\pi^{+}\pi^{0})/B(D^{0} \rightarrow K^{-}\pi^{+})$ and $B(D^{0} \rightarrow K^{-}\pi^{+}\pi^{+}\pi^{-})/B(D^{0} \rightarrow K^{-}\pi^{+}).$ 139 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 $\overline{D}^{*-}a_1^+$ is twice that for $\overline{D}^{*-}\pi^{+}\pi^{+}\pi^{-}$.) ¹⁴⁰BORTOLETTO 92 reports 0.0159 \pm 0.0028 \pm 0.0037 for B($D^*(2010)^+ \rightarrow D^0 \pi^+$) = 0.57 ± 0.06 . 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. ¹⁴¹ALBRECHT 90J reports $0.012 \pm 0.003 \pm 0.004$ for B($D^*(2010)^+ \rightarrow D^0 \pi^+$) = 0.57 ± 0.06. 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. ¹⁴²ALBRECHT 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 AL-BRECHT 90J. 143 BEBEK 87 value has been updated in BERKELMAN 91 to use same assumptions as noted for BORTOLETTO 92.



$\Gamma((D^*(2010)^-\pi^+\pi^+\pi^-))$) nonresonant)/Γ _{total}			Г ₃₉ /Г	•
VALUE	DOCUMENT ID	TECN	<u>COMMENT</u>		
$0.0000 \pm 0.0019 \pm 0.0016$	¹⁴⁴ BORTOLETTO92	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$	

¹⁴⁴BORTOLETTO 92 assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$ and uses Mark III branching fractions for the D and $D^*(2010)$.

$\Gamma(D^*(2010)^- \pi^+ \rho^0) / \Gamma_{\rm tot}$	al		Г ₄₀ /Г
VALUE	DOCUMENT ID	TECN	COMMENT
$0.00573 \pm 0.00317 \pm 0.00004$	¹⁴⁵ BORTOLETTO92	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
145 BORTOLETTO 92 reports 0.57 \pm 0.06. We rescale to 10^{-2} . Our first error is th error from using our best v and uses Mark III branching	$0.0068 \pm 0.0032 \pm 0.002$ o our best value B(D^* (201 eir experiment's error and alue. Assumes equal produces g fractions for the D .	1 for B(0) ⁺ \rightarrow our secution of	$D^*(2010)^+ \rightarrow D^0 \pi^+) =$ $D^0 \pi^+) = (67.7 \pm 0.5) \times$ ond error is the systematic B^+ and B^0 at the $\Upsilon(4S)$
$\Gamma(D^*(2010)^-a_1(1260)^+))$	/Γ _{total}		Г ₄₁ /Г
VALUE	DOCUMENT ID	TECN	COMMENT
0.0130 ± 0.0027 OUR AVERAG	jΕ		
$0.0126 \pm 0.0020 \pm 0.0022$ 14	^{46,147} ALAM 94	CLE2	$e^+e^- ightarrow ~\Upsilon(4S)$
$0.0152\!\pm\!0.0070\!\pm\!0.0001$	¹⁴⁸ BORTOLETTO92	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
146 ALAM 94 value is twice t	heir $\Gamma(D^*(2010)^- \pi^+ \pi^+)$	$\pi^{-})/\Gamma_{-}$	value based on their

¹⁴⁰ ALAM 94 value is twice their $\Gamma(D^*(2010)^-\pi^+\pi^+\pi^-)/\Gamma_{\text{total}}$ value based on their observation that the three pions are dominantly in the $a_1(1260)$ mass range 1.0 to 1.6 GeV.

¹⁴⁷ 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($D^0 \rightarrow K^- \pi^+ \pi^+ \pi^-$)/B($D^0 \rightarrow K^- \pi^+$).

¹⁴⁸ BORTOLETTO 92 reports $0.018 \pm 0.006 \pm 0.006$ for $B(D^*(2010)^+ \rightarrow D^0 \pi^+) = 0.57 \pm 0.06$. 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.

$\Gamma(D^*(2010)^-\pi^+\pi^+\pi^-\pi^0)$))/Γ_{total} /Ts DOCUMENT ID) TE(IN COMME	Г ₄₂ /Г
0.0176±0.0027 OUR AVERAG	iE	<u>/ _ (</u>	<u>comit</u>	
$0.0172 \pm 0.0014 \pm 0.0024$	¹⁴⁹ ALEXANDEF	R 01B CL	E2 e ⁺ e ⁻	$ ightarrow ~ \Upsilon(4S)$
$0.0345 \!\pm\! 0.0181 \!\pm\! 0.0003$	28 ¹⁵⁰ ALBRECHT	90j AR	$G e^+e^-$	$\rightarrow \Upsilon(4S)$
¹⁴⁹ Assumes equal production	of B^+ and B^0 at the	$\Upsilon(4S)$. Th	ne signal is o	consistent with
all observed $\omega \pi^+$ having p	roceeded through the $ ho'$	′+ resonan	ce at mass 1	$1349 \pm 25 {+10 \atop -5}$
MeV and width 547 \pm 86 $^+$	-46 45 MeV.			C C
¹⁵⁰ ALBRECHT 90J reports 0.0 0.06. We rescale to our bes Our first error is their exp from using our best value. uses Mark III branching frac	$0.041\pm0.015\pm0.016$ for st value B $(D^*(2010)^+)$ eriment's error and our Assumes equal product ctions for the <i>D</i> .	$B(D^*(201)) \rightarrow D^0 \pi^+$ second er ion of B^+	$(0)^+ \rightarrow D^0$ $(0)^+ \rightarrow D^0$ ror is the sy and B^0 at t	π^+) = 0.57 \pm = 0.5) \times 10 ⁻² . A stematic error the $\Upsilon(4S)$ and
$\Gamma(D^{*-}3\pi^+2\pi^-)/\Gamma_{total}$				Г ₄₃ /Г
VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT	
4.72±0.59±0.71	¹⁵¹ MAJUMDER 0	04 BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
¹⁵¹ Assumes equal production	of B^+ and B^0 at the 7	r(4 <i>S</i>).		
$\Gamma(D^*(2010)^- \rho \overline{\rho} \pi^+) / \Gamma_{tot}$	al			Г44/Г
VALUE (units 10 ⁻⁴)	DOCUMENT ID	TECN	COMMENT	
$6.5^{+1.3}_{-1.2}\pm1.0$	¹⁵² ANDERSON	01 CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
152 Assumes equal production	of B^+ and B^0 at the 7	∩(4 <i>S</i>).		
$\Gamma(D^*(2010)^- \rho \overline{n}) / \Gamma_{total}$				Г ₄₅ /Г
VALUE (units 10 ⁻⁴)	DOCUMENT ID	TECN	COMMENT	
$14.5^{+3.4}_{-3.0}\pm 2.7$	¹⁵³ ANDERSON	01 CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
153 Assumes equal production	of B^+ and B^0 at the 7	r(4 <i>S</i>).		
$\Gamma(\overline{D}^*(2010)^-\omega\pi^+)/\Gamma_{\text{total}}$	DOCUMENT ID	TECN	COMMENT	Г ₄₆ /Г
0.0029±0.0003±0.0004	¹⁵⁴ ALEXANDER 0)1B CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
¹⁵⁴ Assumes equal production all observed $\omega \pi^+$ having p	of B^+ and B^0 at the of the of the of the observation of the obs	$\Upsilon(4S)$. Th $'^+$ resonant	ne signal is o ce at mass 1	consistent with $349 + 25 + 10$
MeV and width 547 \pm 86 ⁺	$-\frac{46}{45}$ MeV.			<u> </u>
	- 45			

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$\Gamma(\overline{D}_{2}^{*}(2460)^{-}\pi^{+})/\Gamma$	total				Г ₄₇ /Г
VALUE	<u>CL%</u>	DOCUMENT ID	TECN	COMMENT	-
<0.0022	90 155	ALAM	94 CLE2	$e^+e^- \rightarrow \Upsilon(4S)$)
155 ALAM 94 assumes e absolute B($D^0 \rightarrow P$	equal produc $(\pi^+\pi^+)$ and	tion of B^+ and $B(D_2^*(2460)^+)$	B^0 at the $T \rightarrow D^0 \pi^+$)	r(4S) and use the $= 30%$.	CLEO II
$\Gamma(\overline{D}_2^*(2460)^- \rho^+)/\Gamma_1$	total				Г ₄₈ /Г
VALUE	<u>CL%</u>	DOCUMENT ID	TECN	COMMENT	
<0.0049	90 156	⁵ ALAM	94 CLE2	$e^+e^- \rightarrow \Upsilon(4S)$)
156 ALAM 94 assumes e absolute B($D^0 \rightarrow \ P$	equal produc $(\pi^+\pi^+)$ and	tion of <i>B</i> ⁺ and B(<i>D</i> [*] ₂ (2460) ⁺	B^0 at the $D \rightarrow D^0 \pi^+$)	$\Gamma(4S)$ and use the $= 30\%$.	CLEO II
$\Gamma(D^-D^+)/\Gamma_{total}$					Г ₄₉ /Г
VALUE	<u>CL%</u>	DOCUMENT ID	TECN	COMMENT	
<9.4 × 10 ⁻⁴	90 157	LIPELES	00 CLE2	$e^+e^- ightarrow ~\Upsilon(4S)$)
• • • We do not use the	e following c	lata for averages	, fits, limits,	etc. • • •	
$< 5.9 \times 10^{-3}$	90	BARATE	98Q ALEP	$e^+e^- \rightarrow Z$	
$< 1.2 imes 10^{-3}$	90	ASNER	97 CLE2	$e^+e^- \rightarrow \Upsilon(4S)$)
¹⁵⁷ Assumes equal produ	uction of B^+	and B^0 at the	$\Upsilon(4S).$		

$\frac{\Gamma(D^{-}D_{s}^{+})}{\Gamma_{\text{total}}}$		TECN	Г₅₀/Г		
0.0080±0.0030 OUR AVERAGE	<u>bocoment ib</u>	1201	COMMENT		
$0.0084 \!\pm\! 0.0030 \!+\! 0.0020 \\ -\! 0.0021$	¹⁵⁸ GIBAUT	96 CLE2	$e^+e^- \rightarrow \Upsilon(4S)$		
0.013 \pm 0.011 \pm 0.003 0.007 \pm 0.004 \pm 0.002 • • • We do not use the following	¹⁵⁹ ALBRECHT ¹⁶⁰ BORTOLETT(ng data for averages, fit	92G ARG D92 CLEO s, limits, etc.	$e^+e^- \rightarrow \Upsilon(4S)$ $e^+e^- \rightarrow \Upsilon(4S)$		
0.012 ± 0.007	3 ¹⁶¹ BORTOLETT	O90 CLEO	$e^+e^- \rightarrow \Upsilon(4S)$		
158 GIBAUT 96 reports 0.0087 \pm	\pm 0.0024 \pm 0.0020 for B($D_{\rm s}^+ \to \phi \pi^+$	(-) = 0.035. We rescale		
to our best value ${\rm B}(D_s^+ - experiment's {\rm error}$ and our se $^{159}{\rm ALBRECHT}$ 92G reports 0.0	$\phi \ \phi \pi^+) = (3.6 \pm 0.9)$ econd error is the system $017 \pm 0.013 \pm 0.006$ for) $\times 10^{-2}$. (atic error from or B($D_{s}^{+} \rightarrow$	Our first error is their m using our best value. $\phi\pi^+$) = 0.027. We		
rescale to our best value $B(D_s^+ \rightarrow \phi \pi^+) = (3.6 \pm 0.9) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes PDG 1990 D^+ branching ratios, e.g., $B(D^+ \rightarrow K^- \pi^+ \pi^+) = 7.7 \pm 1.0\%$. 160 BORTOLETTO 92 reports 0.0080 \pm 0.0045 \pm 0.0030 for $B(D_s^+ \rightarrow \phi \pi^+) = 0.030 \pm$					
0.011. We rescale to our be error is their experiment's er our best value. Assumes equ branching fractions for the L	st value $B(D^+_{s} o \phi \pi^+)$ ror and our second erro al production of B^+ and b.	$F^{-})=(3.6\pm0)$ r is the syste B^{0} at the γ	$(0.9) \times 10^{-2}$. Our first matic error from using $(4S)$ and uses Mark III		
¹⁰¹ BORTOLETTO 90 assume	$B(D_s \to \phi \pi^+) = 2\%.$	Superseded I	by BORTOLETTO 92.		

$\Gamma(D^*(2010)^-D_s^+)/\Gamma_{total}$				Г ₅₁ /Г
VALUE EVTS	DOCUMENT ID	TECN	<u>COMMENT</u>	
0.0107 ± 0.0029 OUR AVERAGE	E			
$0.0103 \pm 0.0019 \pm 0.0025$	¹⁶² AUBERT	031 BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$0.0110 \!\pm\! 0.0021 \!+\! 0.0026 \\ -\! 0.0027$	¹⁶³ AHMED	00в CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$0.010\ \pm 0.008\ \pm 0.003$	¹⁶⁴ ALBRECHT	92g ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$0.013 \ \pm 0.008 \ \pm 0.003$	¹⁶⁵ BORTOLETTO	92 CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\bullet \bullet \bullet$ We do not use the follow	ing data for averages	, fits, limits,	etc. • • •	
$0.0090 \!\pm\! 0.0027 \!\pm\! 0.0022$	166 GIBAUT	96 CLE2	Repl. by A	HMED 00B
0.024 ±0.014 3	¹⁶⁷ BORTOLETTO	90 CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
¹⁶² AUBERT 031 reports 0.010	$3 \pm 0.0014 \pm 0.0013$	3 for $B(D_s^+)$	$\rightarrow \phi \pi^+$)	= 0.036. We
rescale to our best value B(<i>l</i> experiment's error and our se ¹⁶³ AHMED 00B reports 0.0110 rescale to our best value B(<i>l</i> experiment's error and our se ¹⁶⁴ ALBRECHT 92G reports 0.	$D_s^+ \rightarrow \phi \pi^+) = (3.6)$ econd error is the syst $0 \pm 0.0018 \pm 0.0012$ $D_s^+ \rightarrow \phi \pi^+) = (3.6)$ econd error is the syst $0.14 \pm 0.010 \pm 0.002$	$5 \pm 0.9) \times 10^{-1}$ tematic error 1 for $B(D_s^+)$ $5 \pm 0.9) \times 10^{-1}$ tematic error 3 for $B(D_s^+)$	p^{-2} . Our find r from using $\rightarrow \phi \pi^+$) p^{-2} . Our find r from using $\rightarrow \phi \pi^+$)	rst error is their our best value. = 0.036. We rst error is their our best value. = 0.027. We
rescale to our best value B(I experiment's error and our set Assumes PDG 1990 D^+ an $3.71 \pm 0.25\%$, B($D^+ \rightarrow R$ $= 55 \pm 4\%$. 165 BORTOLETTO 92 reports 0	$D_s^+ \rightarrow \phi \pi^+) = (3.6)$ econd error is the system d $D^*(2010)^+$ branch $(C^- \pi^+ \pi^+) = 7.1 \pm 0.016 \pm 0.009 \pm 0.006$	$5 \pm 0.9) \times 10^{-10}$ tematic erroning ratios, 1.0%, and 5^{-10} for B(D_s^+	D^{-2} . Our find r from using e.g., B(D^{0} B($D^{*}(2010)$ $\rightarrow \phi \pi^{+}) =$	rst error is their our best value. $\rightarrow K^{-}\pi^{+}) =$ $\mu^{+} \rightarrow D^{0}\pi^{+})$ $= 0.030 \pm 0.011.$
We rescale to our best valu is their experiment's error a best value. Assumes equal branching fractions for the <i>L</i> 166 CIBALIT 06 reports 0 0002 –	e B($D_s^+ \rightarrow \phi \pi^+$) = nd our second error production of B^+ ar D and D^* (2010).	$= (3.6 \pm 0.)$ is the systend B^0 at the second representation of the system of the	9) \times 10 ⁻² . matic error e $\Upsilon(4S)$ an	Our first error from using our d uses Mark III

too GIBAUT 96 reports $0.0093 \pm 0.0023 \pm 0.0016$ for $B(D_s^+ \to \phi \pi^+) = 0.035$. We rescale to our best value $B(D_s^+ \to \phi \pi^+) = (3.6 \pm 0.9) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. 167 BORTOLETTO 90 assume $B(D_s \to \phi \pi^+) = 2\%$. Superseded by BORTOLETTO 92.

$\Gamma(D^-D_s^{*+})/\Gamma_{total}$				Г ₅₂ /Г
VALUE	DOCUMENT ID	TECN	<u>COMMENT</u>	
0.010±0.005 OUR AVERAGE				
$0.010\!\pm\!0.004\!\pm\!0.002$	¹⁶⁸ GIBAUT	96 CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$0.020\!\pm\!0.014\!\pm\!0.005$	¹⁶⁹ ALBRECHT	92g ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
168 GIBAUT 96 reports 0.0100 \pm	$\pm0.0035\pm0.0022$ fo	or $B(D^+_s o$	$\phi \pi^+$) = 0.0	35. We rescale
to our best value B(D_{s}^{+} –	$\rightarrow \phi \pi^+$) = (3.6 ±	= 0.9) × 10	² . Our first	t error is their
experiment's error and our se	econd error is the sys	stematic erro	r from using	our best value.
¹⁶⁹ ALBRECHT 92G reports 0.0	$027 \pm 0.017 \pm 0.00$	09 for $B(D_s^+)$	$\rightarrow \phi \pi^+$)	= 0.027. We
rescale to our best value $B(I)$	$D^+ \rightarrow \phi \pi^+ - (3)$	$6 + 0.9) \times 10^{-1}$	-2 Our fire	st error is their

rescale to our best value $B(D_s^+ \rightarrow \phi \pi^+) = (3.6 \pm 0.9) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes PDG 1990 D^+ branching ratios, e.g., $B(D^+ \rightarrow \kappa^- \pi^+ \pi^+) = 7.7 \pm 1.0\%$.

$[\Gamma(D^*(2010)^- D_s^+) + \Gamma(D_s^+)]$	$D^*(2010)^- D_s^{*+})]/\Gamma_{total}$	(Γ ₅₁ +Γ ₅₃)/Γ
VALUE (units 10^{-2}) EVTS	DOCUMENT ID TECN	COMMENT
0.030 ± 0.008 OUR AVERAGE	170	
$\begin{array}{ccc} 0.030 \pm 0.004 \pm 0.007 \\ 4.1 & \pm 1.1 & \pm 1.0 \end{array} \qquad $	¹⁷⁰ AUBERT 031 BABR ¹⁷¹ BORTOLETTO90 CLEO	$e^+ e^- ightarrow ~\Upsilon(4S) \ e^+ e^- ightarrow ~\Upsilon(4S)$
¹⁷⁰ AUBERT 031 reports (0.03	$00 \pm 0.0019 \pm 0.0039) imes 10^{-2}$ for	$r B(D_{c}^{+} \rightarrow \phi \pi^{+}) = 0.036.$
We rescale to our best value their experiment's error an value.	ue B $(D_s^+ \rightarrow \phi \pi^+) = (3.6 \pm 0.9)$ d our second error is the systemat	$) \times 10^{-2}$. Our first error is ic error from using our best
¹⁷¹ BORTOLETTO 90 reports	s (7.5 \pm 2.0) $ imes$ 10 $^{-2}$ for B(D_s^+ $ ightarrow$	$\phi \pi^+) =$ 0.02. We rescale
to our best value $B(D_s^+)$ experiment's error and our	$\rightarrow \phi \pi^+$) = (3.6 \pm 0.9) \times 10 ⁻ second error is the systematic error	⁻² . Our first error is their or from using our best value.
$\Gamma(D^*(2010)^- D_s^{*+})/\Gamma_{tota}$	1	Г ₅₃ /Г
	DOCUMENT ID TECN	COMMENT
		r = r = r = r = r = r = r = r = r = r =
$0.020 \pm 0.003 \pm 0.003$		$e^+e^- \rightarrow \Upsilon(4S)$
$0.019 \pm 0.004 \pm 0.004$	174 ALBRECHT 926 ARG	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the follow	wing data for averages, fits, limits	. etc. ● ● ●
$0.020 \pm 0.006 \pm 0.005$	¹⁷⁵ GIBAUT 96 CLE2	Repl. by AHMED 00B
172 AUBERT 031 reports 0.01	$97 \pm 0.0015 \pm 0.0030$ for B(D ⁺	$\rightarrow \phi \pi^+$ = 0.036. We
rescale to our best value B experiment's error and our ¹⁷³ AHMED 00B reports 0.01	$(D_s^+ \rightarrow \phi \pi^+) = (3.6 \pm 0.9) \times 1$ second error is the systematic error $82 \pm 0.0037 \pm 0.0025$ for $B(D_s^+)$	0^{-2} . Our first error is their or from using our best value. $\phi = -\phi + \phi = -\phi + \phi = -\phi$
rescale to our best value B experiment's error and our 174 AI BRECHT 926 reports ($(D_s^+ \rightarrow \phi \pi^+) = (3.6 \pm 0.9) \times 1$ second error is the systematic error $0.026 \pm 0.014 \pm 0.006$ for $B(D^+)$	0^{-2} . Our first error is their or from using our best value. $T \rightarrow \phi \pi^+ = 0.027$ We
rescale to our best value B experiment's error and our Assumes PDG 1990 D^+ a $3.71 \pm 0.25\%$, B($D^+ \rightarrow$ $= 55 \pm 4\%$.	$(D_s^+ \rightarrow \phi \pi^+) = (3.6 \pm 0.9) \times 1$ second error is the systematic error and $D^*(2010)^+$ branching ratios, $K^- \pi^+ \pi^+) = 7.1 \pm 1.0\%$, and	0^{-2} . Our first error is their or from using our best value. e.g., $B(D^0 \rightarrow K^- \pi^+) = B(D^*(2010)^+ \rightarrow D^0 \pi^+)$
175 GIBAUT 96 reports 0.0203	$\pm 0.0050 \pm 0.0036$ for $B(D_s^+ \rightarrow s)$	$\phi \pi^+$) = 0.035. We rescale
to our best value $B(D_s^{+})$ experiment's error and our	$\rightarrow \phi \pi^+$) = (3.6 ± 0.9) × 10 ⁻ second error is the systematic error	⁻² . Our first error is their or from using our best value.
$\Gamma(D_{sJ}(2317)^+D^- \times B(D_s))$	$_{sJ}(2317)^+ ightarrow D^+_s \pi^0))/\Gamma_{ m total}$	_I Г ₅₄ /Г
VALUE (units 10^{-3})	DOCUMENT ID TECN	COMMENT
1.1 \pm 0.4 OUR AVERAGE	Error includes scale factor of 1.1.	
$1.8 \ {}^{+0.7}_{-0.5} \ {}^{\pm 0.4}$	76,177 AUBERT,B 04s BABR	$e^+e^- \rightarrow \Upsilon(4S)$

 $0.86\substack{+0.36 + 0.20 \\ -0.30 - 0.21}$ 176,178 Krokovny 03B Bell $e^+e^-
ightarrow argama(4S)$

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 176 Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. ¹⁷⁷ AUBERT, B 04s reports $(1.8 \pm 0.4 \substack{+0.7\\-0.5}) \times 10^{-3}$ for B $(D_s^+ \to \phi \pi^+) = 0.036 \pm 0.009$. We rescale to our best value $B(D_s^+ \rightarrow \phi \pi^+) = (3.6 \pm 0.9) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. ¹⁷⁸ KROKOVNY 03B reports $(0.86^{+0.33}_{-0.26} \pm 0.26) \times 10^{-3}$ for B $(D_c^+ \rightarrow \phi \pi^+) = 0.036 \pm$ 0.009. We rescale to our best value B($D_s^+ \rightarrow \phi \pi^+$) = (3.6 ± 0.9) × 10⁻². Our first error is their experiment's error and our second error is the systematic error from using our best value. $\Gamma(D_{sJ}(2317)^+ D^- \times B(D_{sJ}(2317)^+ \rightarrow D_s^{*+}\gamma))/\Gamma_{\text{total}}$ Γ_{55}/Γ VALUE (units 10^{-3})CL%DOCUMENT IDTECNCOMMENT**<0.95**90179KROKOVNY03BBELL $e^+e^- \rightarrow \Upsilon(4S)$ ¹⁷⁹ Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. $\Gamma(D_{sJ}(2317)^+ D^*(2010)^- \times B(D_{sJ}(2317)^+ \to D_s^+ \pi^0)) / \Gamma_{\text{total}}$ Γ_{56}/Γ DOCUMENT ID TECN COMMENT VALUE (units 10^{-3}) ¹⁸⁰ AUBERT,B 04S BABR $e^+e^- \rightarrow \Upsilon(4S)$ $1.5\pm0.4^{+0.5}_{-0.4}$ ¹⁸⁰ Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. $\Gamma(D_{s,I}(2457)^+ D^- \times B(D_{s,I}(2457)^+ \rightarrow D_s^{*+} \pi^0)) / \Gamma_{\text{total}}$ Γ_{57}/Γ VALUE (units 10^{-3}) DOCUMENT ID TECN COMMENT 2.5 ± 0.9 OUR AVERAGE ^{181,182} AUBERT.B 04S BABR $e^+e^- \rightarrow \Upsilon(4S)$ $2.8^{+1.2}_{-0.9}\pm0.7$ $2.3^{+0.8}_{-0.7}^{+0.8}_{-0.6}$ ^{181,183} KROKOVNY 03B BELL $e^+e^- \rightarrow \Upsilon(4S)$ 181 Assumes equal production of B^+ and B^0 at the $\Upsilon(4S).$ ¹⁸²AUBERT,B 04S reports $(2.8 \pm 0.8 + 1.1)_{-0.8} \times 10^{-3}$ for B $(D_s^+ \to \phi \pi^+) = 0.036 \pm 0.009$. We rescale to our best value $B(D_s^+ \rightarrow \phi \pi^+) = (3.6 \pm 0.9) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. ¹⁸³ KROKOVNY 03B reports $(2.27^{+0.73}_{-0.62} \pm 0.68) \times 10^{-3}$ for B $(D_s^+ \rightarrow \phi \pi^+) = 0.036 \pm 0.036$ 0.009. We rescale to our best value B($D_s^+ \rightarrow \phi \pi^+$) = (3.6 \pm 0.9) imes 10⁻². Our first error is their experiment's error and our second error is the systematic error from using our best value. $\Gamma(D_{sJ}(2457)^+ D^- \times B(D_{sJ}(2457)^+ \rightarrow D_s^+ \gamma)) / \Gamma_{\text{total}}$ Γ_{58}/Γ DOCUMENT ID TECN COMMENT VALUE (units 10^{-3}) 0.81^{+0.28}_{-0.25} OUR AVERAGE $0.80\substack{+0.30 + 0.19 \\ -0.20 - 0.20}$ ^{184,185} AUBERT,B 04S BABR $e^+e^- \rightarrow \Upsilon(4S)$ $0.82^{+0.26}_{-0.24}{\pm}0.20$ ^{184,186} KROKOVNY 03B BELL $e^+e^- \rightarrow \Upsilon(4S)$

¹⁸⁴ Assumes equal proc ¹⁸⁵ AUBERT,B 04S rep	luction o orts (0.8	f B^+ and B^0 at the \pm 0.2 $\substack{+0.3\\-0.2}$) $ imes$ 10 $^{-3}$	$\gamma(4S).$ for B(D_s^+ –	$\rightarrow \phi \pi^+) =$	$0.036 \pm 0.009.$
We rescale to our b their experiment's e value.	est value error and	$B(D_s^+ \rightarrow \phi \pi^+) =$ our second error is t	= (3.6 ± 0.9) he systematic	$ imes 10^{-2}$. O c error from	ur first error is using our best
¹⁸⁶ KROKOVNY 03B r	eports (0	$.82^{+0.22}_{-0.19}\pm0.25)\times$	10^{-3} for B($(D_s^+ \rightarrow \phi \pi)$	$^{+}) = 0.036 \pm$
0.009. We rescale t error is their experi our best value.	o our be: ment's er	st value $B(D_{s}^{+} ightarrow constraints)$ for and our second	$(\phi \pi^+) = (3.6)$	$5\pm$ 0.9) $ imes$ 1 ystematic er	0 ^{—2} . Our first rror from using
Γ(<i>D_{sJ}</i> (2457) ⁺ <i>D</i> ⁻ >	< B(<i>D_s</i>)	$D_s^{*+} \rightarrow D_s^{*+}$	$\gamma))/\Gamma_{ ext{total}}$		Г ₅₉ /Г
VALUE (units 10^{-3})	CL%	DOCUMENT ID	TECN	COMMENT	
<0.60	90	¹⁸⁷ KROKOVNY	03B BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
¹⁸⁷ Assumes equal proc	luction o	f B^+ and B^0 at the	$\Upsilon(4S).$		
Γ(<i>D_{sJ}</i> (2457) ⁺ <i>D</i> ⁻ >	< B(<i>D_s</i>)	$(2457)^+ \rightarrow D_s^+$	π ⁺ π ⁻))/Γ ₁	total	Г ₆₀ /Г
VALUE (units 10^{-3})	CL%	DOCUMENT ID	TECN	COMMENT	
<0.20	90	¹⁸⁸ KROKOVNY	03B BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
¹⁸⁸ Assumes equal proc	luction o	f B^+ and B^0 at the	$\Upsilon(4S).$		
Γ(<i>D_{sJ}</i> (2457) ⁺ <i>D</i> ⁻ >	< B(<i>D_sj</i>	$D_s^+ \to D_s^+ T$	π ⁰))/Γ _{total}		Г ₆₁ /Г
VALUE (units 10^{-3})	CL%	DOCUMENT ID	TECN	COMMENT	
<0.36	90	¹⁸⁹ KROKOVNY	03B BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
¹⁸⁹ Assumes equal proc	luction o	f B^+ and B^0 at the	$\Upsilon(4S).$		
$\Gamma(D_{sJ}(2457)^+ D^*(2$	2010)×	B(<i>D_{sJ}</i> (2457) ⁺ –	$\rightarrow D_s^{*+}\pi^0)$	/Γ _{total}	Г ₆₂ /Г
VALUE (units 10^{-3})		DOCUMENT ID	TECN	COMMENT	
$5.5 \pm 1.2^{+2.2}_{-1.6}$		¹⁹⁰ AUBERT,B	04s BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
¹⁹⁰ Assumes equal proc	luction o	f B^+ and B^0 at the	$\Upsilon(4S).$		l
$\Gamma(D_{sJ}$ (2457) ⁺ D^* (2	2010)×	$B(D_{sJ}(2457)^+ -$	→ D_s ⁺ γ))/Γ	- total	Г ₆₃ /Г
VALUE (units 10^{-3})		DOCUMENT ID	TECN	COMMENT	
$2.3 \pm 0.3 \substack{+0.9 \\ -0.6}$		¹⁹¹ AUBERT,B	04s BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
¹⁹¹ Assumes equal proc	luction o	f B^+ and B^0 at the	$\Upsilon(4S).$		
Γ(<i>D⁻D_{sJ}</i> (2536) ⁺ >	< B(<i>D_sj</i>	$(2536)^+ \rightarrow D^*(2536)^+$	2007) ⁰ K ⁺)))/Γ _{total}	Г ₆₄ /Г
VALUE (units 10^{-4})	CL%	DOCUMENT ID	TECN	COMMENT	
<5	90	AUBERT	03X BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\Gamma(D^*(2010)^- D_{sJ}(2))$	2 536) + >	× B(<i>D_{sJ}</i> (2536) ⁺	→ <i>D</i> *(200	7) ⁰ K ⁺))/	Γ _{total} Γες /Γ
VALUE (units 10^{-4})	CL %	DOCUMENT ID	TFCN	COMMENT	' 05/ '
<7				<u> </u>	22(1.6)
	90	AUBERT	U3X BABR	$e e \rightarrow$	I (4S)
	90	AUBERT	U3X BABK	e e →	I (45)

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 $\Gamma(D^{-}D_{sJ}(2573)^{+} \times B(D_{sJ}(2573)^{+} \rightarrow D^{0}K^{+}))/\Gamma_{total}$ Γ_{66}/Γ $\begin{array}{c|c} \hline DOCUMENT ID \\ \hline AUBERT \\ \hline 03x \\ \hline BABR \\ \hline e^+ e^- \rightarrow \\ \Upsilon(4S) \end{array}$ VALUE (units 10⁻⁴) CL% <1 90 $\Gamma(D^*(2010)^- D_{sJ}(2573)^+ \times B(D_{sJ}(2573)^+ \to D^0 K^+)) / \Gamma_{\text{total}}$ Γ_{67}/Γ DOCUMENT ID TECN COMMENT VALUE (units 10⁻⁴) CL% 03X BABR $e^+e^- \rightarrow \Upsilon(4S)$ <2 AUBERT $\Gamma(D_{\epsilon}^{+}\pi^{-})/\Gamma_{\text{total}}$ Γ_{68}/Γ *VALUE* (units 10^{-6}) CL% DOCUMENT ID TECN COMMENT 27±10 OUR AVERAGE $31.\pm11.+7.$ ¹⁹² AUBERT 03D BABR $e^+e^- \rightarrow \Upsilon(4S)$ 24. <u>-</u> <u>0</u> ±6. ¹⁹³ KROKOVNY 02 BELL $e^+e^- \rightarrow \Upsilon(4S)$ • • • We do not use the following data for averages, fits, limits, etc. • • • 194 ALEXANDER $~_{93B}$ CLE2 $~e^+\,e^-
ightarrow ~\gamma(4S)$ 90 < 280 ¹⁹⁵ BORTOLETTO90 CLEO $e^+e^- \rightarrow \gamma(4S)$ 90 <1300 ¹⁹² AUBERT 03D reports $[B(B^0 \rightarrow D_s^+ \pi^-) \times B(D_s^+ \rightarrow \phi \pi^+)] = (1.13 \pm 0.33 \pm 0.21) \times 10^{-10}$ 10^{-6} . We divide by our best value $B(D_s^+ \rightarrow \phi \pi^+) = (3.6 \pm 0.9) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. ¹⁹³ KROKOVNY 02 reports $[B(B^0 \rightarrow D_s^+ \pi^-) \times B(D_s^+ \rightarrow \phi \pi^+)] = (0.86 + 0.37 \pm 0.30)$ 0.11) × 10⁻⁶. We divide by our best value B($D_s^+ \rightarrow \phi \pi^+$) = (3.6 ± 0.9) × 10⁻². Our first error is their experiment's error and our second error is the systematic error from using our best value. ¹⁹⁴ALEXANDER 93B reports < 270 \times 10⁻⁶ for B($D_s^+ \to \phi \pi^+$) = 0.037. We rescale to our best value B($D_s^+ \rightarrow \phi \pi^+$) = 0.036. ¹⁹⁵BORTOLETTO 90 assume B($D_s \rightarrow \phi \pi^+$) = 2%. $\frac{\left[\Gamma\left(D_{s}^{+}\pi^{-}\right)+\Gamma\left(D_{s}^{-}K^{+}\right)\right]}{\Gamma_{\text{total}}} \qquad \qquad \left(\Gamma_{68}+\Gamma_{7}\right)^{2} \\ \frac{VALUE}{<0.0013} \qquad \qquad \frac{CL\%}{90} \qquad \frac{DOCUMENT\ ID}{196} \qquad \frac{TECN}{ALBRECHT} \qquad \frac{COMMENT}{93E} \qquad \frac{COMMENT}{e^{+}e^{-} \rightarrow \Upsilon(4S)}$ (Γ₆₈+Γ₇₄)/Γ VALUE ¹⁹⁶ ALBRECHT 93E reports $< 1.7 imes 10^{-3}$ for B($D_s^+ o \phi \pi^+$) = 0.027. We rescale to our best value B($D_s^+ \rightarrow \phi \pi^+$) = 0.036. $\Gamma(D_{\epsilon}^{*+}\pi^{-})/\Gamma_{\text{total}}$ Γ_{69}/Γ
 VALUE (units 10⁻⁵)
 CL%
 DOCUMENT ID
 TECN
 COMMENT
 90 AUBERT 03D BABR $e^+e^- \rightarrow \Upsilon(4S)$ < 4.1 • • • We do not use the following data for averages, fits, limits, etc. • • ¹⁹⁷ ALEXANDER 93B CLE2 $e^+e^- \rightarrow \Upsilon(4S)$ <50 90 197 ALEXANDER 93B reports < 44 imes 10 $^{-5}$ for B($D_s^+
ightarrow \phi \pi^+$) = 0.037. We rescale to our best value B($D_{s}^{+} \rightarrow \phi \pi^{+}$) = 0.036.

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 198 ALBRECHT 93E reports $< 1.2 \times 10^{-3}$ for B($D_s^+ \rightarrow ~\phi \pi^+) =$ 0.027. We rescale to our best value B($D_{s}^{+} \rightarrow \phi \pi^{+}$) = 0.036. $\Gamma(D_s^+ \rho^-)/\Gamma_{\rm total}$ Γ_{70}/Γ VALUE < 0.0007 \bullet \bullet \bullet We do not use the following data for averages, fits, limits, etc. \bullet ²⁰⁰ ALBRECHT 93E ARG $e^+e^- \rightarrow \Upsilon(4S)$ < 0.0016 90 199 ALEXANDER 93B reports $< 6.6 imes 10^{-4}$ for B($D_{s}^{+} o \phi \pi^{+}$) = 0.037. We rescale to our best value $B(D_{s}^{+} \rightarrow \phi \pi^{+}) = 0.036$. ²⁰⁰ ALBRECHT 93E reports $< 2.2 \times 10^{-3}$ for B($D_s^+ \rightarrow \phi \pi^+$) = 0.027. We rescale to our best value B($D_s^+ \rightarrow \phi \pi^+$) = 0.036. $\Gamma(D_s^{*+}\rho^{-})/\Gamma_{\text{total}}$ Γ_{71}/Γ $\frac{CL\%}{90} \quad \frac{DOCUMENT ID}{201} \quad \frac{TECN}{ALEXANDER} \quad \frac{TECN}{93B} \quad \frac{COMMENT}{CLE2} \quad e^+e^- \rightarrow \quad \Upsilon(4S)$ VALUE < 0.0008 \bullet \bullet \bullet We do not use the following data for averages, fits, limits, etc. \bullet 90 202 ALBRECHT 93E ARG $e^+e^- \rightarrow \Upsilon(4S)$ < 0.0019 $^{201}\,{\rm ALEXANDER}$ 93B reports $<7.4\times10^{-4}$ for B($D_{s}^{+}\rightarrow~\phi\pi^{+})$ = 0.037. We rescale to our best value B($D_{c}^{+} \rightarrow \phi \pi^{+}$) = 0.036. ²⁰² ALBRECHT 93E reports $< 2.5 \times 10^{-3}$ for B($D_s^+ \rightarrow \phi \pi^+$) = 0.027. We rescale to our best value B($D_c^+ \rightarrow \phi \pi^+$) = 0.036. $\frac{\Gamma(D_s^+ a_1(1260)^-)/\Gamma_{total}}{\sqrt{ALUE}} \xrightarrow{CL\%} \frac{DOCUMENT ID}{203} \xrightarrow{TECN} \frac{COMMENT}{e^+ e^- \rightarrow \Upsilon(4S)}$ 203 ALBRECHT 93E reports $<3.5\times10^{-3}$ for B($D_{s}^{+}\rightarrow~\phi\pi^{+})=$ 0.027. We rescale to our best value B($D_{c}^{+} \rightarrow \phi \pi^{+}$) = 0.036. $\frac{\Gamma(D_s^{*+}a_1(1260)^-)/\Gamma_{total}}{\sqrt{ALUE}} \xrightarrow{CL\%} \frac{DOCUMENT ID}{204} \xrightarrow{TECN} \frac{COMMENT}{e^+e^- \rightarrow \Upsilon(4S)}$

²⁰⁴ ALBRECHT 93E reports $< 2.9 \times 10^{-3}$ for B($D_s^+ \rightarrow \phi \pi^+$) = 0.027. We rescale to our best value B($D_s^+ \rightarrow \phi \pi^+$) = 0.036.

Citation: S. Eidelman et al. (Particle Data Group), Phys. Lett. B 592, 1 (2004) and 2005 partial update for edition 2006 (URL: http://pdg.lbl.gov)

$\Gamma(D_s^-K^+)/\Gamma_{total}$						Г ₇₄ /Г
VALUE (units 10^{-6})	CL%	DOCUMENT ID		TECN	COMMENT	
38±13 OUR AVERA	AGE					
$32.\pm 12.\pm$ 8.		²⁰⁵ AUBERT	03 D	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$45. + 14. \pm 11.$		²⁰⁶ KROKOVNY	02	BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\bullet \bullet \bullet$ We do not use the	followi	ng data for averages	s, fits,	, limits,	etc. • • •	
< 240 <1300	90 90	²⁰⁷ ALEXANDER ²⁰⁸ BORTOLETT	93в О90	CLE2 CLEO	$e^+e^- \rightarrow e^+e^- \rightarrow$	$\Upsilon(4S)$ $\Upsilon(4S)$
²⁰⁵ AUBERT 03D reports	[B(<i>B</i> ⁰	$\rightarrow D^{-}K^{+}) \times B(L$) ⁺ –	$\phi \pi^+)$	$] = (1.16 \pm$	0.36±0.24)×
10 ⁻⁶ . We divide by error is their experime	our bes ent's er	st value $B(D_s^+ \rightarrow q)$ for and our second	$s \ b \pi^+)$ error	= (3.6) is the s	\pm 0.9) $ imes$ 10 ystematic er	$)^{-2}$. Our first ror from using
our best value. 206 KROKOVNY 02 repo	orts [R($(B^0 \rightarrow D^- K^+)$	< B(/	$2^+ \rightarrow$	$(\phi \pi^+) = 0$	(1.61 + 0.45 +
$0.21) \times 10^{-6}$. We div first error is their expusing our best value.	vide by perimen	our best value $B(D_s^{+})$ t's error and our set	\rightarrow cond	$\phi \pi^+$) = error is	(3.6 ± 0.9) the systema	$\times 10^{-2}$. Our otic error from
²⁰⁷ ALEXANDER 93B re	ports <	$3.230 imes10^{-6}$ for B(D_s^+	$\rightarrow \phi \pi^+$) = 0.037.	We rescale to
our best value $B(D_s^+)$	$\rightarrow \phi $	$(\pi^+) = 0.036.$	0			
²⁰⁸ BORTOLETTO 90 a	ssume	$B(D_{\boldsymbol{s}} \to \phi \pi^+) = 2$	2%.			
$\Gamma(D_s^{*-}K^+)/\Gamma_{ ext{total}}$						Г ₇₅ /Г
VALUE (units 10 ⁻⁵)	CL%	DOCUMENT ID		TECN	COMMENT	
< 2.5	90 Gulland	AUBERT	03D	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
• • • vve do not use the	TOIIOWI		6, TIES,	CLE2	etc. • • •	$\mathcal{C}(AC)$
<17 209 ALEXANDED 025	90	-33 ALEXANDER	93B	CLE2	$e \cdot e \rightarrow$	1(45)
200 ALEXANDER 93B re	ports <	$(17 \times 10^{-5} \text{ for B})$	s –	$\rightarrow \phi \pi^+$) = 0.037.	We rescale to
our best value $D(D_s)$	$\rightarrow \psi$	$(1^{\circ}) = 0.030.$				
$\Gamma(D_s^- K^*(892)^+)/\Gamma_{tc}$	otal					Г ₇₆ /Г
VALUE	<u>CL%</u>	DOCUMENT ID		TECN	COMMENT	
<0.0010	90 followi	²¹⁰ ALEXANDER	93B	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
• • • • • • • • • • • • • • • • • • •	an	211 ALBRECHT	o, mo, 03⊏	ARG	$etc. \bullet \bullet \bullet$	$\Upsilon(45)$
210 ALEXANDER 03P KO	norte <	$\sim 0.7 \times 10^{-4}$ for R(л+	,	(-) = 0.037	
ALEXANDER 93B Te	ports <	(, 9.7 × 10 10F B(s	$\rightarrow \varphi \pi$) = 0.037.	vve rescale to
211 AI BRECHT 035 repo	$\rightarrow \phi \eta$	$(7^{+}) = 0.030.$		(d_{π}^{\pm}) -	- 0 027 \\/e	rescale to our
best value $B(D^+ \rightarrow$	 	= 0.036		φπ)-	- 0.027. We	
sest value b(bs	φκ	- 0.000.				
$\Gamma(D_s^{*-}K^*(892)^+)/\Gamma_1$	total					Г ₇₇ /Г
VALUE	<u>CL%</u>	212 ALEXANDER	00-	<u>TECN</u>	<u>COMMENT</u> + -	22(4.6)
<0.0011	90	ALEXANDER	93 B	CLE2	$e \cdot e^- \rightarrow$	1 (45)

• • • We do not use the following data for averages, fits, limits, etc. • • • <0.004 90 213 ALBRECHT 93E ARG $e^+e^- \rightarrow \Upsilon(4S)$

²¹² ALEXANDER 93B reports < 11.0 imes 10⁻⁴ for B($D_s^+
ightarrow \phi \pi^+$) = 0.037. We rescale to our best value $B(D_s^+ \rightarrow \phi \pi^+) = 0.036$. ²¹³ ALBRECHT 93E reports $< 5.8 \times 10^{-3}$ for $B(D_s^+ \rightarrow \phi \pi^+) = 0.027$. We rescale to our

best value B($D_s^+ \rightarrow \phi \pi^+$) = 0.036.

$\Gamma(D_s^-\pi^+K^0)/\Gamma_{\rm total}$						Г ₇₈ /Г
VALUE	CL%	DOCUMENT ID		TECN	<u>COMMENT</u>	
<0.005	90	214 ALBRECHT	93E	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
214 AL RECHT ORE FOR	orte / ·	7.2×10^{-3} for $P(D^+)$,	$(\pi +) =$	- 0.027 \//a	roscala to our

ALBRECHT 93E reports < 7.3 imes 10 $^{-3}$ for B($D^+_{m{s}} o \phi \pi^+)=$ 0.027. We rescale to our best value B($D_s^+ \rightarrow \phi \pi^+$) = 0.036.

$\Gamma(D_{s}^{*-}\pi^{+}K^{\circ})/\Gamma_{tc}$	otal					۲ ₇	'9/Г
VALUE	CL%	DOCUMENT ID		TECN	COMMENT		
<0.0031	90	²¹⁵ ALBRECHT	93E	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$	
²¹⁵ ALBRECHT 93E r	eports < 4	$4.2 imes 10^{-3}$ for B(D_s^+	$ \rightarrow 0$	$\phi \pi^+$)	= 0.027. We	e rescale to	our
best value B(D_s^+	$\rightarrow \phi \pi^+$)	= 0.036.					

$\Gamma(D_s^-\pi^+K^*(892)^0)$	/Γ _{total}				Г ₈₀ /Г
VALUE	<u>CL%</u>	DOCUMENT ID	TECN	<u>COMMENT</u>	
<0.004	90	²¹⁶ ALBRECHT	93e ARG	$e^+e^- \rightarrow c$	$\Upsilon(4S)$
²¹⁶ ALBRECHT 93E rep	orts < 5	$5.0 imes10^{-3}$ for B(D_s^+	$\rightarrow \phi \pi^+) =$	= 0.027. We i	rescale to our
best value B($D^+_{m{s}} ightarrow$	$\phi \pi^+$)	= 0.036.			

$\Gamma(D_s^{*-}\pi^+K^*(892)^0)/\Gamma_{total}$					Г ₈₁ /Г	
VALUE	<u>CL%</u>	DOCUMENT ID		TECN	<u>COMMENT</u>	
<0.0020	90	²¹⁷ ALBRECHT	93E	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
²¹⁷ ALBRECHT 93E repo	orts < 2	$2.7 imes 10^{-3}$ for B(D_s^+	\rightarrow	$\phi \pi^+$) =	= 0.027. We	e rescale to our
best value B($D^+_{m{s}} ightarrow$	$\phi \pi^+$)	= 0.036.				

$\Gamma(\overline{D}^0 K^0) / \Gamma_{\text{total}}$				Г ₈₂ /Г
VALUE	DOCUMENT ID	TECN	COMMENT	
$(5.0^{+1.3}_{-1.2}\pm0.6) imes10^{-5}$	²¹⁸ KROKOVNY	03 BEL	L $e^+e^- \rightarrow \Upsilon(4S)$	5)
	-			

 $^{218}\,\text{Assumes}$ equal production of B^+ and B^0 at the $\varUpsilon(4S).$



 $^{219}\text{Assumes}$ equal production of B^+ and B^0 at the $\varUpsilon(4S).$
$\Gamma(\overline{D}{}^{0}\pi^{0})/\Gamma_{ m total}$						Г ₈₄ /Г
VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT	
2.91±0.28 OUR AVE	ERAGE					
$2.9 \ \pm 0.2 \ \pm 0.3$		²²⁰ AUBERT	0 4B	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$3.1 \ \pm 0.4 \ \pm 0.5$		²²⁰ ABE	02J	BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$2.74^{+0.36}_{-0.32}{\pm}0.55$		²²⁰ COAN	02	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
• • • We do not use the	ne follow	ing data for average	s, fits	, limits,	etc. • • •	
<1.2	90	²²¹ NEMATI	98	CLE2	Repl. by C	OAN 02
<4.8	90	²²² ALAM	94	CLE2	Repl. by N	EMATI 98
²²⁰ Assumes equal proc	luction c	of B^+ and B^0 at the	$r \gamma(4$	5).		
²²¹ NEMATI 98 assume	es equal i	production of B^+ and	d B^{0}	at the 1	$\Upsilon(4S)$ and us	se the PDG 96
values for D^0 , D^{*0}	$, \eta, \eta', z$	and ω branching frac	tions			
²²² ALAM 94 assume e	equal pro	oduction of B^+ and	В ⁰ а	it the γ	(4S) and us	e the CLEO II
absolute $B(D^0 \rightarrow H)$	$(\pi^+\pi^+)$	and the PDG 1992 B	$(D^0 \cdot$	$\rightarrow K^{-}\tau$	$(\tau^{+}\pi^{0})/B(D)$	$0^0 \rightarrow K^- \pi^+$)
and B($D^0 \rightarrow K^-$)	$\pi^+\pi^+\pi$	$(D^0 \rightarrow K^- \pi)$. +).			

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

Г₈₅/Г

VALUE (units 10 ⁻	⁻⁴) <u>CL% E</u>	VTS	DOCUMENT IL)	TECN	COMMENT
2.9±1.0±	0.4		²²³ SATPATHY	03	BELL	$e^+e^- ightarrow ~\Upsilon(4S)$
• • • We do i	not use the f	followi	ng data for averag	es, fits	, limits,	etc. ● ● ●
< 3.9	90		²²⁴ NEMATI	98	CLE2	$e^+e^- ightarrow ~\Upsilon(4S)$
< 5.5	90		²²⁵ ALAM	94	CLE2	Repl. by NEMATI 98
< 6.0	90		226 BORTOLET	TO92	CLEO	$e^+e^- ightarrow ~\Upsilon(4S)$
<27.0	90	4	²²⁷ ALBRECHT	88K	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

 223 Assumes equal production of B^+ and B^0 at the $\Upsilon(4S).$

²²⁴ NEMATI 98 assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$ and use the PDG 96 values for D^0 , D^{*0} , η , η' , and ω branching fractions.

²²⁵ 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 $B(D^0 \rightarrow K^- \pi^+ \pi^+ \pi^-)/B(D^0 \rightarrow K^- \pi^+)$.

²²⁶ BORTOLETTO 92 assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$ and uses Mark III branching fractions for the D.

²²⁷ ALBRECHT 88K reports < 0.003 assuming $B^0 \overline{B}^0 : B^+ B^-$ production ratio is 45:55. We rescale to 50%.

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

Г₈₆/Г

				-
VALUE (units 10^{-4})	CL%	DOCUMENT ID	TEC	CN COMMENT
2.2 ± 0.5 OUR AVERA	GE Err	or includes scale fa	ctor of 1.	6.
$2.5\!\pm\!0.2\!\pm\!0.3$		²²⁸ AUBERT	04B BA	BR $e^+e^- \rightarrow \Upsilon(4S)$
$1.4^{+0.5}_{-0.4}{\pm}0.3$		²²⁸ ABE	02J BE	LL $e^+e^- ightarrow \Upsilon(4S)$
$\bullet \bullet \bullet$ We do not use the	e followir	ng data for averages	s, fits, lim	its, etc. ● ● ●
<1.3	90	²²⁹ NEMATI	98 CLI	E2 $e^+e^- \rightarrow \Upsilon(4S)$
<6.8	90	²³⁰ ALAM	94 CLI	E2 Repl. by NEMATI 98

 228 Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. 229 NEMATI 98 assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$ and use the PDG 96

values for D^0 , D^{*0} , η , η' , and ω branching fractions. ²³⁰ 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 $B(D^0 \rightarrow K^- \pi^+ \pi^+ \pi^-)/B(D^0 \rightarrow K^- \pi^+)$.

$\Gamma(\overline{D}^{0}\eta')/\Gamma_{total}$						Г ₈₇ /Г
VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT	
$1.7 \pm 0.4 \pm 0.2$		²³¹ AUBERT	0 4B	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
• • • We do not use the	follow	ing data for average	s, fits	, limits,	etc. • • •	
9.4	90	²³² NEMATI	98	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
8.6	90	²³³ ALAM	94	CLE2	Repl. by N	IEMATI 98
²³¹ Assumes equal produ	ction o	f B^+ and B^0 at the	$\gamma(4$	<i>S</i>).		
²³² NEMATI 98 assumes	equal p	production of B^+ an	d <i>B</i> ⁰	at the 1	r(4 <i>S</i>) and u	se the PDG 96
values for D° , $D^{*\circ}$, 233 ALAM 04 assume on	η, η' , a	and ω branching fraction of B^+ and	tions.	+ tho γ	(4S) and w	sa tha CLEO II
absolute B($D^0 \rightarrow K$)	(π^+)	and the PDG 1992 B	$(D^0 - D^0)$	$\rightarrow K^{-} \tau$	$(+3)^{10} u$	$0^0 \rightarrow K^- \pi^+$
and B($D^0 \rightarrow K^- \pi^-$	$+\pi^{+}\pi^{+}\pi^{-}$	$^{-})/B(D^{0} \rightarrow K^{-}\pi)$	(<u> </u>).)/2(2	, , ,
			,			F /F
$(D^{\circ}\eta^{\circ})/(D^{\circ}\eta)$				TECH	COMMENT	87/ 86
		DUCUMENT ID	046		$\frac{COMMENT}{1}$	22(4.5)
$0.7 \pm 0.2 \pm 0.1$		AUBERT	04B	BABK	$e \cdot e \rightarrow$	1 (45)
$\Gamma(\overline{D}{}^{0}\omega)/\Gamma_{total}$						Г ₈₈ /Г
VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT	
2.5 ± 0.6 OUR AVERA	GE E	rror includes scale fa	ctor (of 1.5.	1	
$3.0 \pm 0.3 \pm 0.4$		²³⁴ AUBERT	04 B	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$1.8 \pm 0.5 \substack{+0.4 \\ -0.3}$		²³⁴ ABE	02J	BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
• • • We do not use the	follow	ing data for averages	s, fits	, limits,	etc. • • •	
<5.1	90	²³⁵ NEMATI	98	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
< 6.3	90	²³⁰ ALAM	94	CLE2	Repl. by N	IEMATI 98
²³⁴ Assumes equal produ	ction o	$f B^+$ and B^0 at the	$\gamma(4$	S).		
200 NEMATI 98 assumes	equal p	production of B^+ and \dots have a bin π from	d <i>B</i> o	at the	$\Gamma(4S)$ and u	se the PDG 96
236 AI AM 94 assume eq	η,η,a ualpro	ind ω branching fracted of B^+ and	B^0 a	It the γ	(4S) and u	se the CLEO II
absolute B($D^0 \rightarrow K$	$(-\pi^+)$	and the PDG 1992 B	(D ⁰ -	$\rightarrow K^{-} \tau$	$(13)^{-1}$ and $\pi^{+}\pi^{0}$ /B(L	$p^0 \rightarrow K^- \pi^+$
and B($D^0 \rightarrow K^- \pi^-$	$+\pi+\pi$	$^{-})/B(D^{0} \rightarrow K^{-}\pi)$	` +).			,
Γ(D ⁰ K*(892) ⁰)/Γ	- 1		,			Γ
	al (1%	DOCUMENT ID		TECN	COMMENT	• 89/ •
<1.8 × 10 ⁻⁵	90	²³⁷ KROKOVNY	03	BELL	$e^+e^- \rightarrow$	Υ(4S)
²³⁷ Assumes equal produ	ction o	f B^+ and B^0 at the	$\gamma(4$	5).		()
$\Gamma(\overline{D}^{*0}\gamma)/\Gamma_{****}$						۲۰۰/۲
	CL%	DOCUMENT ID		TECN	COMMENT	• 90/ •
<5.0 × 10 ⁻⁵	90	²³⁸ ARTUSO	00	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$

 238 Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

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$\Gamma(\overline{D}^*(2007)^0\pi^0)/\Gamma_{\text{total}}$					Г ₉₁ /Г
VALUE (units 10^{-4}) C	_%	DOCUMENT ID		TECN	COMMENT
2.7 \pm 0.5 OUR AVERA	GE				
$2.9 \pm 0.4 \pm 0.5$	239	9 AUBERT	04 B	BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$2.7 \begin{array}{c} +0.8 \\ -0.7 \end{array} \begin{array}{c} +0.5 \\ -0.6 \end{array}$	23	⁹ ABE	02J	BELL	$e^+e^- \rightarrow \Upsilon(4S)$
$2.20^{+0.59}_{-0.52}{\pm}0.79$	23	⁹ COAN	02	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the fo	llowing o	data for averages	, fits	, limits,	etc. • • •
<4.4 99 <9.7 99) 240) 241	⁰ NEMATI ¹ ALAM	98 94	CLE2 CLE2	Repl. by COAN 02 Repl. by NEMATI 98
²³⁹ Assumes equal producti ²⁴⁰ NEMATI 98 assumes eq values for D^0 , D^{*0} , η , ²⁴¹ ALAM 94 assume equa $B(D^*(2007)^0 \rightarrow D^0 \pi^0 + \pi^0)/B(D^0 \rightarrow D^0)$	on of B^- ual product η' , and μ product η' and al $\kappa = \pi^+$	⁺ and B^0 at the uction of B^+ and ω branching fract tion of B^+ and bsolute B($D^0 \rightarrow B$ and B($D^0 \rightarrow B$)	$\Upsilon(4)$ B^0 diagonal diagon	S). at the γ t the γ (π^+) an $+\pi^+\pi^-$	$\Upsilon(4S)$ and use the PDG 96 (4S) and use the CLEO II ad the PDG 1992 B($D^0 \rightarrow T^-$)/B($D^0 \rightarrow K^- \pi^+$).
$\Gamma(\overline{D}{}^{0}\pi^{0})/\Gamma(\overline{D}{}^{*}(2007)^{0})$	π ⁰)				Г ₈₄ /Г ₉₁
VALUE		DOCUMENT ID		TECN	COMMENT
$1.0 \pm 0.1 \pm 0.2$		AUBERT	04 B	BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$\Gamma(\overline{D}^*(2007)^0 \rho^0) / \Gamma_{\text{total}}$					Г ₉₂ /Г
VALUE C	<u>.%</u>	DOCUMENT ID		TECN	COMMENT
< 5.1 × 10 ⁻⁴ 90) 242	² SATPATHY	03	BELL	$e^+e^- ightarrow ~\Upsilon(4S)$
• • • We do not use the fo	llowing o	data for averages	, tits	, limits,	etc. • • •
<0.00056 99 <0.00117 99) 243) 244	³ NEMATI ⁴ ALAM	98 94	CLE2 CLE2	$e^+ e^- o \ \Upsilon(4S)$ Repl. by NEMATI 98
²⁴² Assumes equal producti ²⁴³ NEMATI 98 assumes eq values for D^0 , D^{*0} , η ,	on of B^- ual prode η' , and a	$^+$ and B^0 at the uction of B^+ and $_{\omega}$ branching fract	$\Upsilon(4 \\ B^0$	S). at the 7	(4S) and use the PDG 96
²⁴⁴ ALAM 94 assume equa $B(D^*(2007)^0 \rightarrow D^0 \pi^0 + K^- \pi^+ \pi^0)/B(D^0 \rightarrow D^0 \pi^0 + K^- \pi^+ \pi^0)/B(D^0 \rightarrow D^0 + K^- \pi^+ \pi^0)/B(D^0 + K^- \pi^+ \pi^0)/B(D^0 \rightarrow D^0 + K^- \pi^+ \pi^0)/B(D^0 + K^- \pi^0$	product) and al (π^{+})	tion of B^+ and bsolute ${ m B}(D^0 o$ and ${ m B}(D^0 o$ P	B ^U a Κ (π ⁻	t the γ (π^+) and $(\pi^+\pi^+\pi^-)$	(4 <i>S</i>) and use the CLEO II ad the PDG 1992 B($D^0 \rightarrow -$)/B($D^0 \rightarrow K^- \pi^+$).
$\Gamma(\overline{D}^*(2007)^0\eta)/\Gamma_{total}$					Г ₉₃ /Г
VALUE (units 10^{-4}) C	.%	DOCUMENT ID		TECN	COMMENT
$2.6 \pm 0.4 \pm 0.4$	24	⁵ AUBERT	04 B	BABR	$e^+e^- ightarrow ~\Upsilon(4S)$
• • • We do not use the fo	llowing o	data for averages	s, fits	, limits,	etc. ● ● ●
<4.6 90) 24	⁵ ABE	02J	BELL	$e^+e^- ightarrow ~\Upsilon(4S)$
<2.6 9) 24	⁶ NEMATI	98	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
<6.9 90) 24	⁷ ALAM	94	CLE2	Repl. by NEMATI 98
²⁴⁵ Assumes equal producti ²⁴⁶ NEMATI 98 assumes eq values for D^0 , D^{*0} , η ,	on of B^- ual prode η' , and a	⁺ and B ⁰ at the uction of B ⁺ and ω branching fract	$\Upsilon(4$ d B^0 tions.	S). at the 7	$\Upsilon(4S)$ and use the PDG 96
²⁴⁷ ALAM 94 assume equa B($D^*(2007)^0 \rightarrow D^0 \pi^0$ $K^- \pi^+ \pi^0$)/B($D^0 \rightarrow D^0$	product)) and all $(K^- \pi^+)$	tion of B^+ and bsolute B($D^0 \rightarrow$ and B($D^0 \rightarrow P$	Β ⁰ a Κ Ϛ ^{π⁻}	t the γ (π^+) and $(\pi^+\pi^+\pi^-)$	(4S) and use the CLEO II ad the PDG 1992 B($D^0 \rightarrow -$)/B($D^0 \rightarrow K^- \pi^+$).

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$\Gamma(\overline{D}^0\eta)/\Gamma(\overline{D}^*(2007)^0)$	⁰ η)					Г ₈₆ /Г ₉₃
VALUE	•/	DOCUMENT ID		TECN	COMMENT	
$0.9 \pm 0.2 \pm 0.1$		AUBERT	0 4B	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\Gamma(\overline{D}^*(2007)^0\eta')/\Gamma(\overline{D})$	[*] (2007) ⁰	η)				Г94/Г93
VALUE		DOCUMENT ID		TECN	COMMENT	-
$0.5 \pm 0.3 \pm 0.1$		AUBERT	0 4B	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\Gamma(\overline{D}^*(2007)^0\eta')/\Gamma_{\rm tot}$	al			TECH	601415NT	Г ₉₄ /Г
<u>VALUE</u>	<u>CL%</u> 00 248	<u>DUCUMENT ID</u>	045	<u>TECN</u>	<u>COMMENT</u>	$\mathcal{C}(AC)$
<0.00020	following c	AUBER I	04B fite	BABR	$e \cdot e \rightarrow$	1 (45)
			o, iits		+ -	22(4.5)
<0.0014	90 249	BRANDENB	98	CLE2	$e e \rightarrow + e \rightarrow + e^{-}$	T(4S)
< 0.0019	90 250		90 94	CLE2 CLE2	e e → Repl by N	7 (43) IEMATI 98
248 A an under a much much		\vdash and \mathcal{B}^0 at the	$\gamma_{(A)}$	C)	Repl. by R	
values for D^0 , D^{*0} , r^{250} ALAM 94 assume equals $B(D^*(2007)^0 \rightarrow D^0 K^- \pi^+ \pi^0)/B(D^0 \rightarrow D^0)$	$(\eta, \eta', and \omega)$ and product π^{0} and all $K^{-}\pi^{+}$	by branching fraction of B^+ and solute $B(D^0 \rightarrow B)$ and $B(D^0 \rightarrow B)$	tions B^0 a K^- $\zeta^- \pi$	the γ the π^+ and $+\pi^+\pi^-$	(4S) and us of the PDG $^{-})/B(D^{0} - $	se the CLEO II 1992 B($D^0 \rightarrow K^- \pi^+$).
$\Gamma(\overline{D}^0\eta')/\Gamma(\overline{D}^*(2007))$	⁰ η′)					Г ₈₇ /Г ₉₄
VALUE	.,	DOCUMENT ID		TECN	<u>COMMENT</u>	017 01
$1.3 \pm 0.8 \pm 0.2$		AUBERT	0 4B	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\Gamma(\overline{D}^0\omega)/\Gamma(\overline{D}^*(2007))$	⁰ ω)					Г ₈₈ /Г ₁₀₁
VALUE		DOCUMENT ID		TECN	COMMENT	
$0.7 \pm 0.1 \pm 0.1$		AUBERT	04 B	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\Gamma(\overline{D}^{*}(2007)^{0}\pi^{+}\pi^{-})/$	/Γ _{total}	DOCUMENT ID		TECN	COMMENT	Г ₉₅ /Г
$(6.2\pm1.2\pm1.8) \times 10^{-4}$	251,252	2 SATDATHY	02	RELL		$\Upsilon(\Lambda S)$
251	·· (D+		03		$e e \rightarrow$	1 (43)
²⁵² No assumption about	the interm	and B° at the rediate mechanis	n is	made in	the analysi	S.
$\Gamma(\overline{D}^*(2007)^0 K^0)/\Gamma_{to}$	tal					Г ₉₆ /Г
VALUE	<u>CL%</u>	DOCUMENT ID		TECN	<u>COMMENT</u>	
$< 6.6 \times 10^{-5}$	90 253	³ KROKOVNY	03	BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
²⁵³ Assumes equal produc	ction of B^+	$^+$ and B^0 at the	$\Upsilon(4$	<i>S</i>).		
			``			
$\Gamma(\overline{D}^*(2007)^0 K^*(892))$) ⁰)/Γ _{total}		,	-		Г ₉₇ /Г
$\Gamma(\overline{D}^{*}(2007)^{0}K^{*}(892))$ <u>VALUE</u>	$(0)/\Gamma_{total}$	DOCUMENT ID		TECN	<u>COMMENT</u>	Г ₉₇ /Г
$\frac{\Gamma(\overline{D}^{*}(2007)^{0} K^{*}(892)}{\frac{VALUE}{<6.9 \times 10^{-5}}}$	⁰)/Γ_{total} <u>^{CL%}</u> 90 254	DOCUMENT ID KROKOVNY	03	<u>TECN</u> BELL	$\frac{COMMENT}{e^+e^-} \rightarrow$	Γ₉₇/Γ <i>Υ</i> (4 <i>S</i>)

$\Gamma(D^*(2007)^0 K^*(3))$	392)⁰)/Г₁	total						Г ₉₈ /Г
VALUE	<u>CL%</u>	DOCU	MENT ID		TECN	COMM	ENT	
<4.0 × 10 ⁻⁵	90	²⁵⁵ KRO	KOVNY	03	BELL	e ⁺ e ⁻	\rightarrow	$\Upsilon(4S)$
²⁵⁵ Assumes equal pr	oduction o	f B^+ and	B^0 at the	$r \gamma(4$	<i>S</i>).			
$\Gamma(D^*(2007)^0\pi^+\pi)$	$+\pi^{-}\pi^{-}$)/Г _{total}						Г99/Г
VALUE (units 10^{-3})		DOCU	MENT ID		TECN	СОММ	ENT	
2.7 ± 0.5 OUR AVE	RAGE							
$2.60\!\pm\!0.47\!\pm\!0.37$		²⁵⁶ MAJI	UMDER	04	BELL	e^+e^-	\rightarrow	$\Upsilon(4S)$
$3.0 \pm 0.7 \pm 0.6$		²⁵⁶ EDW	ARDS	02	CLE2	e^+e^-	\rightarrow	$\Upsilon(4S)$
²⁵⁶ Assumes equal pr	oduction o	f B^+ and	B ⁰ at the	r(4	S).			
$\Gamma(D^*(2007)^0 \pi^+ \pi)$	$+\pi^{-}\pi^{-}$)/Г(<i>D</i> *(2	2010) ⁻ π	r ⁺ π ⁻	+ _π - _π ())		Г <u>9</u> 9/Г ₄₂
VALUE		<u>DOCU</u>	MENT ID		TECN	<u>COMM</u>	ENT	
$0.17 {\pm} 0.04 {\pm} 0.02$		²⁵⁷ EDW	ARDS	02	CLE2	e^+e^-	\rightarrow	$\Upsilon(4S)$
²⁵⁷ Assumes equal pr	oduction o	f B^+ and	B ⁰ at the	r(4	<i>S</i>).			
Γ(<i>D</i> *(2010) ⁺ <i>D</i> *(2010)-),	/Γ _{total}						Г ₁₀₀ /Г
VALUE	<u>CL%</u>	<u> </u>	CUMENT I	D	TECN	<u> </u>	1MEN	Т
(8.7±1.8)×	10 ^{—4} OUF	R AVERAGI						
$(8.3 \pm 1.6 \pm 1.2) \times$	10 ⁻⁴ 2	^{258,259} AU	BERT	0	2м ВАВ	$R e^+$	e	$\rightarrow ~ \Upsilon(4S)$
$(9.9^{+4.2}_{-3.3}{\pm}1.2) imes$	10 ⁻⁴	²⁵⁸ LIF	PELES	0	0 CLE	2 e ⁺	e	$\rightarrow ~\Upsilon(4S)$
$\bullet \bullet \bullet$ We do not use	the follow	ing data fo	r average	s, fits	, limits,	etc. •	••	
$(6.2^{+4.0}_{-2.9}{\pm}1.0) imes$	10 ⁻⁴	²⁶⁰ AR	TUSO	9	9 CLE	2 Rep	I. by	LIPELES 00
< 6.1 ×	10-3 90	²⁶¹ BA	RATE	9	8Q ALE	Pe ⁺	e	→ Z
< 2.2 ×	10 ⁻³ 90	²⁶² AS	NER	9	7 CLE	2 Rep	l. by	ARTUSO 99
²⁵⁸ Assumes equal pr	oduction o	f B^+ and	B^0 at the	r(4	5).			
²⁵⁹ AUBERT 02M als	so assumes	the measu	red <i>CP</i> -o	dd fra	action o	f the fir	nal st	ates is 0.22 \pm
0.18 ± 0.03 . 260 ARTUSO 00 USA	$B(\Upsilon(\Lambda S))$	$B_{B}0\overline{B}0$)-(48 +	1)%				
261 BARATE 980 (A	I FPH) obs	$\rightarrow D D$	$) = (+0 \pm$	т)/0. an ex	pected	hackgro	und	of 0.10 ± 0.03
which correspond	s to a bran	ching ratio	of (2.3^+)	-1.9	$\pm 0.4) \times$	(10^{-3})	and	
262 ASNER 97 at CL	FO observ	es 1 event	with an e	- 1.2 - evnec	ted bac	ground	lof(0.022 ± 0.011
This corresponds	to a branc	hing ratio o	of $(5.3 + 7)^{-7}$	$7.1 \pm 3.7 \pm$	1.0) ×	10^{-4} .		
۲ <u>(آ)</u> *(2007) ⁰ س) /ا								Г101 /Г
VALUE (units 10^{-4})		ЛОСИ	IMENT ID		TECN	СОММ	ENT	. 101 / 1
4.2±0.7±0.9	90	263 AURI	ERT	04R	BABR	e ⁺ e ⁻	, - →	$\Upsilon(4S)$
• • • We do not use	the follow	ing data fo	r average	s, fits	, limits,	etc. •	• •	()
< 7.9	90	263 ABE	2	02J	BELL	e ⁺ e ⁻	\rightarrow	$\Upsilon(4S)$

130		ing data ioi averages	, 1113	, 11111123,	
	90	²⁶³ ABE	02J	BELL	$e^+e^- ightarrow ~\Upsilon(4S)$
	90	²⁶⁴ NEMATI	98	CLE2	$e^+e^- ightarrow ~\Upsilon(4S)$
	90	²⁶⁵ ALAM	94	CLE2	Repl. by NEMATI 98

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< 7.4

<21

 263 Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

²⁶⁴ NEMATI 98 assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$ and use the PDG 96 values for D^0 , D^{*0} , η , η' , and ω branching fractions.

²⁶⁵ 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 $B(D^0 \rightarrow K^- \pi^+ \pi^+ \pi^-)/B(D^0 \rightarrow K^- \pi^+)$.

$\Gamma(D^*(2010)^+D^-)$	/Γ _{total}					Γ ₁₀₂ /Γ
VALUE	CL%	DOCUMENT ID		TECN	COMMENT	
<6.3 × 10 ⁻⁴	90	266 LIPELES	00	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
\bullet \bullet \bullet We do not use	the follow	ing data for average	s, fits	, limits,	etc. • • •	
$< 5.6 imes 10^{-3}$	90	BARATE	98Q	ALEP	$e^+e^- \rightarrow$	Ζ
$< 1.8 \times 10^{-3}$	90	ASNER	97	CLE2	$e^+e^- ightarrow$	$\Upsilon(4S)$

²⁶⁶ Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

$[\Gamma(D^*(2010)^-D^+)]$	+ Γ(<i>D</i> *(2010) ⁺ <i>D</i> ⁻)],	/Γ _{total}		Г ₁₀₃ /Г
VALUE (units 10^{-3})	DOCUMENT IE	D TECN	COMMENT	
0.93±0.15 OUR AVER	AGE			
$0.88\!\pm\!0.10\!\pm\!0.13$	²⁶⁷ AUBERT	03J BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$1.17\!\pm\!0.26^{+0.22}_{-0.25}$	267,268 ABE	02Q BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
\bullet \bullet \bullet We do not use th	e following data for averag	es, fits, limits,	etc. • • •	
$1.48 \!\pm\! 0.38 \!+\! 0.28 \\ - \! 0.31$	267,269 _{ABE}	02Q BELL	$e^+e^- ightarrow$	$\Upsilon(4S)$

²⁶⁷ Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

 268 The measurement is performed using fully reconstructed D^* and D^+ decays.

²⁶⁹ The measurement is performed using a partial reconstruction technique for the D^* and fully reconstructed D^+ decays as a cross check.

$\Gamma(D^*(2007)^0 \overline{D}^*(2007)^0)$	′) ⁰)/Γ _{tota}	al				Г ₁₀₄ /Г
VALUE	<u>CL%</u>	DOCUMENT ID		TECN	<u>COMMENT</u>	
<0.027	90	BARATE	98Q	ALEP	$e^+e^- \rightarrow$	Ζ
$\Gamma(D^- D^0 K^+) / \Gamma_{\text{total}}$						Г ₁₀₅ /Г
VALUE (units 10^{-3})		DOCUMENT ID		TECN	COMMENT	
$1.7 \pm 0.3 \pm 0.3$	270) AUBERT	03X	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
²⁷⁰ Assumes equal produc	tion of B^+	$^+$ and B^0 at the	$r \gamma(4$	<i>S</i>).		
$\Gamma(D^-D^*(2007)^0K^+)$	/Γ _{total}					Г ₁₀₆ /Г
VALUE (units 10^{-3})		DOCUMENT ID		TECN	COMMENT	
4.6±0.7±0.7	271	^L AUBERT	03X	BABR	$e^+ e^- \rightarrow$	$\Upsilon(4S)$
²⁷¹ Assumes equal produc	tion of B ⁻	$^+$ and B^0 at the	$\gamma(4$	<i>S</i>).		
$\Gamma(D^*(2010)^- D^0 K^+)$	/Γ _{total}					Г ₁₀₇ /Г
VALUE (units 10^{-3})		DOCUMENT ID		TECN	COMMENT	
$3.1^{+0.4}_{-0.3}\pm 0.4$	272	² AUBERT	03X	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$

²⁷² Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

Γ(<i>D</i> *(2010) ⁻ <i>D</i> *(200	07) ⁰ K	+)/	Γ _{total}				Г ₁₀₈ /Г
VALUE (units 10^{-3})		,	DOCUMENT ID		TECN	COMMENT	
$11.8 \pm 1.0 \pm 1.7$		273	AUBERT	03X	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
²⁷³ Assumes equal produ	uction o	of <i>B</i> +	and B^0 at the	Υ(4	5).		
$\Gamma(D^-D^+\kappa^0)/\Gamma_{total}$							Г ₁₀₉ /Г
VALUE (units 10^{-3})	CL%		DOCUMENT ID		TECN	COMMENT	
<1.7	90	274	AUBERT	03X	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
²⁷⁴ Assumes equal produ	uction o	of <i>B</i> +	and B^0 at the	$\Upsilon(4$	<i>S</i>).		
[Γ(<i>D</i> *(2010) ⁻ <i>D</i> + <i>K</i>	^ю) + Г	- (D-	⁻ D*(2010) ⁺ /	K ⁰)]	/Γ _{tota}	l	Г ₁₁₀ /Г
VALUE (units 10^{-3})			DOCUMENT ID		TECN	COMMENT	
$6.5 \pm 1.2 \pm 1.0$		275	AUBERT	03X	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
²⁷⁵ Assumes equal produ	uction o	of <i>B</i> +	and B^0 at the	$\Upsilon(4$	S).		
Γ(<i>D</i> *(2010) ⁻ <i>D</i> *(202	10)+ <i>k</i>	(°)/	Г _{total}				Г ₁₁₁ /Г
VALUE (units 10^{-3})			DOCUMENT ID		TECN	COMMENT	
$8.8^{+1.5}_{-1.4}{\pm}1.3$		276	AUBERT	03X	BABR	$e^+e^- ightarrow$	$\Upsilon(4S)$
²⁷⁶ Assumes equal produ	uction o	of <i>B</i> +	and B^0 at the	Υ(4	<i>S</i>).		
$\Gamma(\overline{D}^0 D^0 K^0) / \Gamma_{\text{total}}$							Г ₁₁₂ /Г
$\frac{\Gamma(\overline{D}^0 D^0 K^0)}{\Gamma_{\text{total}}}$ <i>VALUE</i> (units 10 ⁻³)	<u>CL%</u>		DOCUMENT ID		TECN	COMMENT	Г ₁₁₂ /Г
$\frac{\Gamma(\overline{D}^0 D^0 K^0) / \Gamma_{\text{total}}}{\frac{VALUE \text{ (units } 10^{-3})}{< 1.4}}$	<u> </u>	277	DOCUMENT ID	03x	<u>tecn</u> BABR	$\frac{COMMENT}{e^+e^-} \rightarrow$	Γ₁₁₂/Γ <i>Υ</i> (4 <i>S</i>)
$\frac{\Gamma(\overline{D}^{0} D^{0} K^{0}) / \Gamma_{\text{total}}}{\sqrt{ALUE (\text{units } 10^{-3})}}$ <1.4 277 Assumes equal production	<u>CL%</u> 90 uction o	277 of B ⁺	DOCUMENT ID AUBERT and B ⁰ at the	03× 7(4	<u>TECN</u> BABR S).	$\frac{COMMENT}{e^+e^-} \rightarrow$	Γ₁₁₂/Γ <i>Υ</i> (4 <i>S</i>)
$\frac{\Gamma(\overline{D}^{0} D^{0} K^{0}) / \Gamma_{\text{total}}}{^{VALUE (\text{units } 10^{-3})}}$ <1.4 $\frac{277 \text{ Assumes equal produce}}{\Gamma(\overline{D}^{0} D^{*}(2007)^{0} K^{0})}$	<u>CL%</u> 90 uction o	277 of B ⁺	DOCUMENT ID AUBERT and B ⁰ at the 2007) ⁰ D ⁰ K ⁰	03× 7(4	<u>TECN</u> BABR S).	$\frac{COMMENT}{e^+e^-} \rightarrow$	Γ ₁₁₂ /Γ ^(4S) Γ ₁₁₃ /Γ
$\frac{\Gamma(\bar{D}^{0} D^{0} K^{0}) / \Gamma_{\text{total}}}{\sqrt{ALUE (\text{units } 10^{-3})}}$ <1.4 ²⁷⁷ Assumes equal produce [$\Gamma(\bar{D}^{0} D^{*}(2007)^{0} K^{0})$ VALUE (units 10^{-3})	<u>CL%</u> 90 uction α) + Γ(277 of B ⁺	DOCUMENT ID AUBERT and B ⁰ at the 2007) ⁰ D ⁰ K ⁰ DOCUMENT ID	03× 1 (4 2)]/I	<u>TECN</u> BABR S). total <u>TECN</u>	$\frac{COMMENT}{e^+e^-} \rightarrow$	Γ ₁₁₂ /Γ ⁽⁴⁵⁾ Γ ₁₁₃ /Γ
$\frac{\Gamma(\overline{D}^{0} D^{0} K^{0}) / \Gamma_{\text{total}}}{\sqrt{ALUE (\text{units } 10^{-3})}}$ <1.4 277 Assumes equal produce $[\Gamma(\overline{D}^{0} D^{*} (2007)^{0} K^{0}) + \frac{\sqrt{ALUE (\text{units } 10^{-3})}}{\sqrt{ALUE (\text{units } 10^{-3})}}$ <3.7	<u>CL%</u> 90 uction o () + Γ(<u>CL%</u> 90	277 of B ⁺ (D *() 278	DOCUMENT ID AUBERT and B ⁰ at the 2007) ⁰ D ⁰ K ⁰ DOCUMENT ID AUBERT	03× 7(4 7)]/I 03×	<u>TECN</u> BABR S). total <u>TECN</u> BABR	$\frac{COMMENT}{e^+e^-} \rightarrow \frac{COMMENT}{e^+e^-} \rightarrow \frac{COMMENT}{e^+e^-}$	Γ₁₁₂/Γ <i>Υ</i> (4 <i>S</i>) Γ₁₁₃/Γ <i>Υ</i> (4 <i>S</i>)
$\frac{\Gamma(\bar{D}^{0} D^{0} K^{0}) / \Gamma_{\text{total}}}{\sqrt{ALUE (\text{units } 10^{-3})}}$ <1.4 277 Assumes equal produce $\frac{\Gamma(\bar{D}^{0} D^{*} (2007)^{0} K^{0})}{\sqrt{ALUE (\text{units } 10^{-3})}}$ <3.7 278 Assumes equal produce	$\frac{CL\%}{90}$ uction of \mathbf{r} $\frac{CL\%}{90}$	277 of B ⁺ (D*(278 of B ⁺	DOCUMENT ID AUBERT and B^0 at the 2007) $^0 D^0 K^0$ DOCUMENT ID AUBERT and B^0 at the	03× r(4)]/I 03× r(4	<u>TECN</u> BABR S). total <u>TECN</u> BABR S).	$\frac{COMMENT}{e^+ e^- \rightarrow}$ $\frac{COMMENT}{e^+ e^- \rightarrow}$	Γ₁₁₂/Γ <i>Υ</i> (4 <i>S</i>) Γ₁₁₃/Γ <i>Υ</i> (4 <i>S</i>)
$\frac{\Gamma(\overline{D}^{0} D^{0} K^{0}) / \Gamma_{\text{total}}}{\sqrt{ALUE (\text{units } 10^{-3})}}$ <1.4 277 Assumes equal produce $\left[\Gamma(\overline{D}^{0} D^{*}(2007)^{0} K^{0}) + \frac{VALUE (\text{units } 10^{-3})}{\sqrt{3.7}}\right]$ <3.7 278 Assumes equal produce $\Gamma(\overline{D}^{*}(2007)^{0} D^{*}(2007))$	$\frac{CL\%}{90}$ uction of $\frac{CL\%}{90} + \Gamma(0)$ $\frac{CL\%}{90}$ uction of $\frac{7}{90} K(0)$	277 of B ⁺ (D *(278 of B ⁺ D)/ Г	DOCUMENT ID AUBERT and B^0 at the 2007) ⁰ $D^0 K^0$ <u>DOCUMENT ID</u> AUBERT and B^0 at the total	03× (4)]/I 03× 7(4	<u>TECN</u> BABR S). total <u>TECN</u> BABR S).	$\frac{COMMENT}{e^+ e^-} \rightarrow \frac{COMMENT}{e^+ e^-} \rightarrow \frac{COMAENT}{e^+ e^-} \rightarrow \frac{COMAENT}{e^- e^-} $	Γ₁₁₂/Γ <i>Υ</i> (4 <i>S</i>) Γ₁₁₃/Γ <i>Υ</i> (4 <i>S</i>) Γ₁₁₄/Γ
$\frac{\Gamma(\overline{D}^{0} D^{0} K^{0}) / \Gamma_{\text{total}}}{\sqrt{ALUE (\text{units } 10^{-3})}}$ <1.4 ²⁷⁷ Assumes equal produce $[\Gamma(\overline{D}^{0} D^{*}(2007)^{0} K^{0})]$	$\frac{CL\%}{90}$ uction of $\frac{CL\%}{90}$ $\frac{CL\%}{90}$ uction of $\frac{CL\%}{90}$ $CL\%$	277 of B ⁺ (D *(278 of B ⁺ (D)/ Г	DOCUMENT ID AUBERT and B^0 at the 2007) ⁰ D^0 K^0 DOCUMENT ID AUBERT and B^0 at the total DOCUMENT ID	03× 7(4)]/I 03× 7(4	<u>TECN</u> BABR S). total <u>TECN</u> BABR S).	$\frac{COMMENT}{e^+e^-} \rightarrow \frac{COMMENT}{e^+e^-} \rightarrow COMMENT$	Γ ₁₁₂ /Γ <i>Υ</i> (4 <i>S</i>) Γ ₁₁₃ /Γ <i>Υ</i> (4 <i>S</i>) Γ ₁₁₄ /Γ
$\frac{\Gamma(\overline{D}^{0} D^{0} K^{0}) / \Gamma_{\text{total}}}{\sqrt{ALUE (\text{units } 10^{-3})}}$ <1.4 277 Assumes equal produce $[\Gamma(\overline{D}^{0} D^{*}(2007)^{0} K^{0}) / (2007)^{0} K^{0})$	$\frac{CL\%}{90}$ $\frac{CL\%}{90} + \Gamma(0)$ $\frac{CL\%}{90}$ $\frac{CL\%}{90} + \frac{CL\%}{90}$	277 of B ⁺ (D*(278 of B ⁺ P)/Г 279	$\frac{DOCUMENT \ ID}{AUBERT}$ and B^0 at the 2007) ⁰ $D^0 K^0$ $\frac{DOCUMENT \ ID}{AUBERT}$ and B^0 at the total $\frac{DOCUMENT \ ID}{AUBERT}$	03x 7(4)]/I 03x 7(4 03x	<u>TECN</u> BABR S). total <u>TECN</u> BABR S).	$\frac{COMMENT}{e^+ e^- \rightarrow}$ $\frac{COMMENT}{e^+ e^- \rightarrow}$ $\frac{COMMENT}{e^+ e^- \rightarrow}$	Γ₁₁₂/Γ <i>Υ</i> (4 <i>S</i>) Γ₁₁₃/Γ <i>Υ</i> (4 <i>S</i>) Γ₁₁₄/Γ <i>Υ</i> (4 <i>S</i>)
$\frac{\Gamma(\bar{D}^{0} D^{0} K^{0}) / \Gamma_{\text{total}}}{\sqrt{ALUE (\text{units } 10^{-3})}}$ <1.4 277 Assumes equal produce $\left[\Gamma(\bar{D}^{0} D^{*}(2007)^{0} K^{0}) + \frac{VALUE (\text{units } 10^{-3})}{\sqrt{3.7}}\right]$ <3.7 278 Assumes equal produce $\Gamma(\bar{D}^{*}(2007)^{0} D^{*}(2000) + \frac{VALUE (\text{units } 10^{-3})}{\sqrt{6.6}})$ <6.6 279 Assumes equal produce	$\frac{CL\%}{90}$ $\frac{1}{90} + \Gamma(0)$ $\frac{CL\%}{90}$ $\frac{CL\%}{90}$ $\frac{CL\%}{90}$ $\frac{CL\%}{90}$ $\frac{CL\%}{90}$ $\frac{CL\%}{90}$	277 of B ⁺ 278 of B ⁺ 2 79 (7 279 of B ⁺	$\frac{DOCUMENT \ ID}{AUBERT}$ and B^0 at the 2007) ⁰ $D^0 K^0$ $\frac{DOCUMENT \ ID}{AUBERT}$ and B^0 at the 2007 $D^0 K^0$ $\frac{DOCUMENT \ ID}{AUBERT}$ AUBERT and B^0 at the 2000 B^0 B^0 at the 2000 B^0 at the 2000 B^0 B^0 at the 2000 B^0 B^0 B^0 at the 2000 B^0 B^0 at the 2000 B^0 B^0 B^0 at the 2000 B^0	03x 7(4)]/I 03x 7(4 03x 7(4	TECN BABR S). total TECN BABR S).	$\frac{COMMENT}{e^+e^-} \rightarrow \frac{COMMENT}{e^+e^-} \rightarrow \frac{COMAE}{e^+e^-} \rightarrow \frac{COMAE}$	Γ₁₁₂/Γ <i>Υ</i> (4 <i>S</i>) Γ₁₁₃/Γ <i>Υ</i> (4 <i>S</i>) <i>Γ</i> (4 <i>S</i>) <i>Υ</i> (4 <i>S</i>)
$\frac{\Gamma(\overline{D}^{0} D^{0} K^{0}) / \Gamma_{\text{total}}}{\sqrt{ALUE (\text{units } 10^{-3})}}$ <1.4 ²⁷⁷ Assumes equal produce $[\Gamma(\overline{D}^{0} D^{*}(2007)^{0} K^{0}) / K^{0}]$ <i>VALUE</i> (units 10^{-3}) <3.7 ²⁷⁸ Assumes equal produce $\Gamma(\overline{D}^{*}(2007)^{0} D^{*}(2000) / K^{0}) / K^{0}$ <i>VALUE</i> (units 10^{-3}) <6.6 ²⁷⁹ Assumes equal produce $\Gamma((\overline{D} + \overline{D}^{*})(D + D^{*})) / (D + D^{*})$	$\frac{CL\%}{90}$ $\frac{CL\%}{90} + \Gamma(0)$ $\frac{CL\%}{90}$ $\frac{CL\%}{90}$ $\frac{CL\%}{90}$ $\frac{CL\%}{90}$ $\frac{CL\%}{90}$ $\frac{CL\%}{90}$ $\frac{CL\%}{90}$	277 of B ⁺ 278 of B ⁺ 279 of B ⁺	DOCUMENT ID AUBERT and B^0 at the 2007) ⁰ D^0 K^0 DOCUMENT ID AUBERT and B^0 at the total DOCUMENT ID AUBERT AUBERT and B^0 at the	$\begin{array}{c} 03x \\ 7(4 \\ 0) \\ 0 \\ 0 \\ 7(4 \\ 0) \\ 0 \\ 7(4 \\ 0 \\ 0 \\ 7(4 \\ 0 \\ 7(4 \\ 0 \\ 0 \\ 7(4 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ $	<u>TECN</u> BABR S). total <u>TECN</u> BABR S). <u>TECN</u> BABR	$\frac{COMMENT}{e^+ e^-} \rightarrow \frac{COMMENT}{e^+ e^-} \rightarrow \frac{COMAT}{e^+ e^-} \rightarrow \frac{COMAT}{e^- e^-} \rightarrow \frac{COMAT}{e$	Γ₁₁₂/Γ <i>Υ</i> (4 <i>S</i>) Γ₁₁₃/Γ <i>Υ</i> (4 <i>S</i>) <i>Γ</i> (4 <i>S</i>) Γ (115/Γ
$\frac{\Gamma(\overline{D}^{0} D^{0} K^{0}) / \Gamma_{\text{total}}}{\sqrt{ALUE (\text{units } 10^{-3})}}$ <1.4 ²⁷⁷ Assumes equal produce $\left[\Gamma(\overline{D}^{0} D^{*}(2007)^{0} K^{0} + C^{0}(2007)^{0} K^{0} + C^{0}(2007)^{0} K^{0} + C^{0}(2007)^{0} D^{*}(2007)^{0} D^{*}(2007)^$	$\frac{CL\%}{90}$ $\frac{CL\%}{90}$ $\frac{CL\%}{90}$ $\frac{CL\%}{90}$ $\frac{CL\%}{90}$ $\frac{CL\%}{90}$ $\frac{CL\%}{90}$ $\frac{CL\%}{90}$ $\frac{CL\%}{90}$	277 of B ⁺ 278 of B ⁺ 279 of B ⁺ total	DOCUMENT ID AUBERT and B^0 at the 2007) ⁰ D^0 K^0 DOCUMENT ID AUBERT and B^0 at the total DOCUMENT ID AUBERT and B^0 at the DOCUMENT ID	03x r(4)]/I 03x r(4 03x r(4	<u>TECN</u> BABR S). total <u>TECN</u> BABR S). <u>TECN</u> <u>TECN</u>	$\frac{COMMENT}{e^+e^-} \rightarrow \frac{COMMENT}{e^+e^-} \rightarrow \frac{COMMENT}{e^+e^-} \rightarrow \frac{COMMENT}{COMMENT}$	Γ 112/Γ <i>Υ</i> (4 <i>S</i>) Γ 113/Γ <i>Υ</i> (4 <i>S</i>) Γ 114/Γ <i>Υ</i> (4 <i>S</i>) Γ 115/Γ
$\frac{\Gamma(\overline{D}^{0} D^{0} K^{0}) / \Gamma_{\text{total}}}{\sqrt{ALUE (\text{units } 10^{-3})}}$ <1.4 277 Assumes equal produce $[\Gamma(\overline{D}^{0} D^{*}(2007)^{0} K^{0}) / (XAUUE (\text{units } 10^{-3}))]$ <3.7 278 Assumes equal produce $\Gamma(\overline{D}^{*}(2007)^{0} D^{*}(2000) / (XAUUE (\text{units } 10^{-3}))]$ <6.6 279 Assumes equal produce $\Gamma((\overline{D} + \overline{D}^{*}) (D + D^{*}) / (D + D^{*}) / (D + D^{*}) / (D + D^{*}) / (AUUE (\text{units } 10^{-2}))]$ 4.3 ± 0.3 ± 0.6	$\frac{CL\%}{90}$ $\frac{CL\%}{90}$ $\frac{CL\%}{90}$ $\frac{CL\%}{90}$ $\frac{CL\%}{90}$ $\frac{CL\%}{90}$ $\frac{CL\%}{90}$ $\frac{CL\%}{90}$ $\frac{CL\%}{90}$	277 of B ⁺ 278 of B ⁺ 279 of B ⁺ total 280	$\frac{DOCUMENT \ ID}{AUBERT}$ and B^0 at the $2007)^0 D^0 K^0$ $\frac{DOCUMENT \ ID}{AUBERT}$ and B^0 at the $\frac{DOCUMENT \ ID}{AUBERT}$ and B^0 at the $\frac{DOCUMENT \ ID}{AUBERT}$ AUBERT	03x 7(4)]/I 03x 7(4 03x 7(4 03x	TECN BABR S). total TECN BABR S). TECN BABR S).	$\frac{COMMENT}{e^+e^- \rightarrow}$ $\frac{COMMENT}{e^+e^- \rightarrow}$ $\frac{COMMENT}{e^+e^- \rightarrow}$	Γ 112/Γ <i>Υ</i> (4 <i>S</i>) Γ 113/Γ <i>Υ</i> (4 <i>S</i>) Γ 114/Γ <i>Υ</i> (4 <i>S</i>) Γ 115/Γ <i>Υ</i> (4 <i>S</i>)
$\frac{\Gamma(\overline{D}^{0} D^{0} K^{0}) / \Gamma_{\text{total}}}{\sqrt{ALUE (\text{units } 10^{-3})}}$ <1.4 ²⁷⁷ Assumes equal produce $\left[\Gamma(\overline{D}^{0} D^{*}(2007)^{0} K^{0} + C^{0}(2007)^{0} K^{0} + C^{0}(2007)^{0} K^{0} + C^{0}(2007)^{0} D^{*}(2007)^{0} D^{*}(2007)^$	$\frac{CL\%}{90}$ C	277 of B ⁺ 278 of B ⁺ 279 of B ⁺ total 280 of B ⁺	DOCUMENT ID AUBERT and B^0 at the 2007) ⁰ D^0 K^0 DOCUMENT ID AUBERT and B^0 at the DOCUMENT ID AUBERT and B^0 at the DOCUMENT ID AUBERT and B^0 at the	$\begin{array}{c} 03x \\ r(4) \\ \hline) \\ \hline \\ 03x \\ r(4) \\ \hline \\ 0x \\ r(4) \\ \hline \\ 0x \\ r(4) \\ r(4) \\ \hline \\ 0x \\ r(4) \\ r(4) \\ \hline \\ 0x \\ r(4) \\ r(4$	TECN BABR S). total TECN BABR S). TECN BABR S).	$\frac{COMMENT}{e^+e^- \rightarrow}$ $\frac{COMMENT}{e^+e^- \rightarrow}$ $\frac{COMMENT}{e^+e^- \rightarrow}$ $\frac{COMMENT}{e^+e^- \rightarrow}$	$ Γ_{112}/Γ $ $ τ(45) $ $ Γ_{113}/Γ $ $ τ(45) $ $ Γ_{114}/Γ $ $ τ(45) $ $ Γ_{115}/Γ $ $ τ(45) $

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$\Gamma(\eta_c K^0) / \Gamma_{\text{total}}$					Г ₁₁₆ /Г
VALUE (units 10 ⁻³)	DOCUMENT ID		TECN	COMMENT	
1.16 ± 0.26 OUR AVERAGE					
$1.14\!\pm\!0.19\!\pm\!0.32$	²⁸¹ AUBERT,B	04 B	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$1.23 {\pm} 0.23 {+} 0.40 \\ {-} 0.41$	²⁸² FANG	03	BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$1.09^{+0.55}_{-0.42}{\pm}0.33$	²⁸³ EDWARDS	01	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$

²⁸¹ AUBERT, B 04B reports $[B(B^0 \rightarrow \eta_c K^0) \times B(\eta_c(1S) \rightarrow K\overline{K}\pi)] = (0.0648 \pm 0.0085 \pm 0.0071) \times 10^{-3}$. We divide by our best value $B(\eta_c(1S) \rightarrow K\overline{K}\pi) = (5.7 \pm 1.6) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

 282 Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

²⁸³ 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.

$\Gamma(\eta_c K^0)/\Gamma(J/\psi(1S)K^0)$					Γ ₁₁₆ /Γ ₁₁₈
VALUE	DOCUMENT ID	7	ECN	COMMENT	
$1.39 {\pm} 0.20 {\pm} 0.45$	²⁸⁴ AUBERT,B	04b E	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
²⁸⁴ Uses BABAR measurement	of B($B^0 \rightarrow J/\psi K^0$)) = (8	8.5 ± 0	$.5\pm$ 0.6) $ imes$	10 ⁻⁴ .

$\Gamma(\eta_c K^*(892)^0)/\Gamma_{total}$

VALUE (units 10^{-3})	DOCUMENT ID T		TECN	COMMENT	
$1.62 \pm 0.32 \substack{+0.55 \\ -0.60}$	²⁸⁵ FANG	03	BELL	$e^+e^- ightarrow ~\Upsilon(4S)$	

 285 Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

$\Gamma(\eta_c K^*(892)^0) / \Gamma(\eta_c K^0)$					Γ ₁₁₇ /Γ ₁₁₆
VALUE	DOCUMENT ID		TECN	COMMENT	
$1.33 \pm 0.36 \substack{+0.24 \\ -0.33}$	FANG	03	BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$

$\Gamma(J/\psi(1S)K^0)/\Gamma_{\text{total}}$

VALUE (units 10^{-4})	CL% EVTS	DOCUMENT ID	TECN	COMMENT		
8.5 \pm 0.5 OUR AVE	RAGE					
$7.9\!\pm\!0.4\!\pm\!0.9$		²⁸⁶ ABE	03B BELL	$e^+e^- ightarrow ~\Upsilon(4S)$		
$8.3\!\pm\!0.4\!\pm\!0.5$		²⁸⁶ AUBERT	02 BABR	$e^+e^- ightarrow ~\Upsilon(4S)$		
$9.5\!\pm\!0.8\!\pm\!0.6$		²⁸⁶ AVERY	00 CLE2	$e^+e^- ightarrow ~\Upsilon(4S)$		
$11.5\!\pm\!2.3\!\pm\!1.7$		²⁸⁷ ABE	96н CDF	<i>р</i> рат 1.8 ТеV		
$7.0\!\pm\!4.1\!\pm\!0.1$		288 BORTOLETT	O92 CLEO	$e^+e^- ightarrow ~\Upsilon(4S)$		
$9.3{\pm}7.3{\pm}0.2$	2	²⁸⁹ ALBRECHT	90j ARG	$e^+e^- ightarrow ~\Upsilon(4S)$		
ullet $ullet$ $ullet$ We do not use the following data for averages, fits, limits, etc. $ullet$ $ullet$						
11		200				

$8.5^{+1.4}_{-1.2}\pm0.6$			286 JESSOP	97	CLE2	Repl. by AVERY 00
$7.5 {\pm} 2.4 {\pm} 0.8$		10	²⁸⁸ ALAM	94	CLE2	Sup. by JESSOP 97
<50	90		ALAM	86	CLEO	$e^+e^- ightarrow ~\Upsilon(4S)$

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 Γ_{117}/Γ

Γ₁₁₈/Γ

²⁸⁶Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. ²⁸⁷ABE 96H assumes that $B(B^+ \rightarrow J/\psi K^+) = (1.02 \pm 0.14) \times 10^{-3}$. ²⁸⁸ BORTOLETTO 92 reports (6 ± 3 ± 2) × 10⁻⁴ for B($J/\psi(1S) \rightarrow e^+e^-$) = 0.069 ± 0.009. We rescale to our best value $B(J/\psi(1S) \rightarrow e^+e^-) = (5.93 \pm 0.10) \times 10^{-2}$. 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 $\Upsilon(4S)$.

²⁸⁹ ALBRECHT 90J reports $(8 \pm 6 \pm 2) \times 10^{-4}$ for B($J/\psi(1S) \rightarrow e^+e^-$) = 0.069 ± 0.009. We rescale to our best value $B(J/\psi(1S) \rightarrow e^+e^-) = (5.93 \pm 0.10) \times 10^{-2}$. 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 $\Upsilon(4S)$.

$\Gamma(J/\psi(1S)K^+\pi^-)/$	Γ _{total}		
VALUE (units 10^{-3})	<u>CL%</u>	EVTS	DOCUMEN

Γ₁₁₉/Γ

VALUE (units 10^{-3})	<u>CL%</u> EVTS	DOCUMENT ID	TECN	COMMENT
$1.16 {\pm} 0.56 {\pm} 0.02$		²⁹⁰ BORTOLETTO92	CLEO	$e^+e^- \rightarrow \gamma(4S)$
• • • We do not use the fo	llowing data	for averages, fits, limits, e	etc. • •	•

<1.3	90	25	¹ ALBRECHT	87d ARG	$e^+ e^- \rightarrow \Upsilon(4S)$
<6.3	90	2	GILES	84 CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

²⁹⁰ BORTOLETTO 92 reports (1.0 \pm 0.4 \pm 0.3) imes 10⁻³ for B(J/ ψ (1S) \rightarrow $e^+e^-)$ = 0.069 ± 0.009 . We rescale to our best value $B(J/\psi(1S) \rightarrow e^+e^-) = (5.93 \pm 0.10) \times$ 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 $\Upsilon(4S)$. ²⁹¹ ALBRECHT 87D assume $B^+B^-/B^0\overline{B}^0$ ratio is 55/45. $K\pi$ system is specifically se-

lected as nonresonant.

$\Gamma(J/\psi(1S) K^{*}(892)^{0})/$	Γ _{total}			Г ₁₂₀ /Г
VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
1.31 ± 0.07 OUR AVERAGE				
$1.29\!\pm\!0.05\!\pm\!0.13$		²⁹² ABE	02N BELL	$e^+e^- ightarrow ~\Upsilon(4S)$
$1.24\!\pm\!0.05\!\pm\!0.09$		²⁹² AUBERT	02 BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$1.74\!\pm\!0.20\!\pm\!0.18$		²⁹³ ABE	980 CDF	<i>р</i> р 1.8 ТеV
$1.32\!\pm\!0.17\!\pm\!0.17$		²⁹⁴ JESSOP	97 CLE2	$e^+ e^- ightarrow ~\Upsilon(4S)$
$1.28\!\pm\!0.66\!\pm\!0.02$		²⁹⁵ BORTOLETTO	O92 CLEO	$e^+e^- ightarrow ~\Upsilon(4S)$
$1.28\!\pm\!0.60\!\pm\!0.02$	6	²⁹⁶ ALBRECHT	90J ARG	$e^+e^- ightarrow ~\Upsilon(4S)$
$4.1 \ \pm 1.8 \ \pm 0.1$	5	²⁹⁷ BEBEK	87 CLEO	$e^+e^- ightarrow ~\Upsilon(4S)$
$\bullet \bullet \bullet$ We do not use the fo	llowing	data for averages, fit	s, limits, etc.	• • •
$1.36\!\pm\!0.27\!\pm\!0.22$		²⁹⁸ ABE	96н CDF	Sup. by ABE 980
$1.69\!\pm\!0.31\!\pm\!0.18$	29	²⁹⁹ ALAM	94 CLE2	Sup. by JESSOP 97
		³⁰⁰ ALBRECHT	94g ARG	$e^+e^- ightarrow ~\Upsilon(4S)$
4.0 ± 0.30		³⁰¹ ALBAJAR	91E UA1	$E_{cm}^{p\overline{p}}$ = 630 GeV
$3.3 \hspace{0.1in} \pm 0.18$	5	³⁰² ALBRECHT	87d ARG	$e^+e^- ightarrow ~\Upsilon(4S)$
4.1 ± 0.18	5	³⁰³ ALAM	86 CLEO	Repl. by BEBEK 87

 292 Assumes equal production of B^+ and B^0 at the $\Upsilon(4S).$

²⁹³ ABE 980 reports $[B(B^0 \rightarrow J/\psi(1S)K^*(892)^0)]/[B(B^+ \rightarrow J/\psi(1S)K^+)] = 1.76 \pm 0.14 \pm 0.15$. We multiply by our best value $B(B^+ \rightarrow J/\psi(1S)K^+) = (9.9 \pm 1.0) \times 10^{-4}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

²⁹⁴ Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

²⁹⁵ BORTOLETTO 92 reports $(1.1 \pm 0.5 \pm 0.3) \times 10^{-3}$ for $B(J/\psi(1S) \rightarrow e^+e^-) = 0.069 \pm 0.009$. We rescale to our best value $B(J/\psi(1S) \rightarrow e^+e^-) = (5.93 \pm 0.10) \times 10^{-2}$. 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 $\Upsilon(4S)$. ²⁹⁶ ALBRECHT 90J reports $(1.1 \pm 0.5 \pm 0.2) \times 10^{-3}$ for $B(J/\psi(1S) \rightarrow e^+e^-) = 0.069 \pm 0.009$. We rescale to our best value $B(J/\psi(1S) \rightarrow e^+e^-) = (5.93 \pm 0.10) \times 10^{-2}$. 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 $\Upsilon(4S)$.

²⁹⁷ BEBEK 87 reports $(3.5 \pm 1.6 \pm 0.3) \times 10^{-3}$ for $B(J/\psi(1S) \rightarrow e^+e^-) = 0.069 \pm 0.009$. We rescale to our best value $B(J/\psi(1S) \rightarrow e^+e^-) = (5.93 \pm 0.10) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Updated in BORTOLETTO 92 to use the same assumptions.

²⁹⁸ABE 96H assumes that B($B^+ \to J/\psi K^+$) = (1.02 \pm 0.14) \times 10⁻³.

- ²⁹⁹ The neutral and charged *B* events together are predominantly longitudinally polarized, $\Gamma_L/\Gamma = 0.080 \pm 0.08 \pm 0.05$. This can be compared with a prediction using HQET, 0.73 (KRAMER 92). This polarization indicates that the $B \rightarrow \psi K^*$ decay is dominated by the CP = -1 CP eigenstate. Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.
- ³⁰⁰ ALBRECHT 94G measures the polarization in the vector-vector decay to be predominantly longitudinal, $\Gamma_T/\Gamma = 0.03 \pm 0.16 \pm 0.15$ making the neutral decay a *CP* eigenstate when the K^{*0} decays through $K_S^0 \pi^0$.

³⁰¹ ALBAJAR 91E assumes B_d^0 production fraction of 36%.

³⁰² ALBRECHT 87D assume $B^+ B^- / B^0 \overline{B}^0$ ratio is 55/45. Superseded by ALBRECHT 90J. ³⁰³ ALAM 86 assumes B^\pm / B^0 ratio is 60/40. The observation of the decay $B^+ \rightarrow J/\psi K^*(892)^+$ (HAAS 85) has been retracted in this paper.

$\Gamma(J/\psi(1S) K^*(892)^0) / \Gamma(J/\psi(1S) K^0)$					
VALUE	DOCUMENT ID		TECN	<u>COMMENT</u>	
1.48 ± 0.12 OUR AVERAGE					
$1.49\!\pm\!0.10\!\pm\!0.08$	³⁰⁴ AUBERT	02	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$1.39\!\pm\!0.36\!\pm\!0.10$	ABE	96Q	CDF	p p	
304		∞	\sim		

³⁰⁴ Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

$\Gamma(J/\psi(1S)\eta K_S^0)/\Gamma_{total}$				Г ₁₂₁ /Г
VALUE (units 10 ⁻⁵)	DOCUMENT ID	TECN	COMMENT	
8.4±2.6±2.7	³⁰⁵ AUBERT	04Y BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
305 Assumes equal production o	f B^+ and B^0 at the	$\Upsilon(4S).$		
$\Gamma(J/\psi(1S)\phi K^0)/\Gamma_{ ext{total}}$				Г ₁₂₂ /Г
VALUE	DOCUMENT ID	TECN	COMMENT	
$(9.4\pm2.6) \times 10^{-5}$ OUR .	AVERAGE			
$(10.2\!\pm\!3.8\!\pm\!1.0)\times10^{-5}$	³⁰⁶ AUBERT	030 BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$(\ 8.8^{+3.5}_{-3.0}{\pm}1.3)\times10^{-5}$	³⁰⁷ ANASTASSOV	00 CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$

³⁰⁶ Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

³⁰⁷ ANASTASSOV 00 finds 10 events on a background of 0.5 ± 0.2 . Assumes equal production of B^0 and B^+ at the $\Upsilon(4S)$, a uniform Dalitz plot distribution, isotropic $J/\psi(1S)$ and ϕ decays, and $B(B^+ \rightarrow J/\psi(1S)\phi K^+) = B(B^0 \rightarrow J/\psi(1S)\phi K^0)$.

$\Gamma(J/\psi(1S)K(1270)^0)$	/F _{total}				Г ₁₂₃ /Г
VALUE (units 10^{-3})	DOCUMENT ID	7	TECN	COMMENT	
1.30±0.34±0.32	³⁰⁸ ABE	01L E	BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$

³⁰⁸Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$ and uses the PDG value of $B(B^+ \rightarrow J/\psi(1S) K^+) = (1.00 \pm 0.10) \times 10^{-3}$.

$\Gamma(J/\psi(1S)\pi^0)/\Gamma_{\text{total}}$

 Γ_{124}/Γ

VALUE (units 10^{-5})	CL%	EVTS		DOCUMENT ID		TECN	COMMENT
2.2±0.4 OUR A	VERAC	GE					
$2.3\!\pm\!0.5\!\pm\!0.2$			309	ABE	03 B	BELL	$e^+e^- ightarrow ~\Upsilon(4S)$
$2.0\!\pm\!0.6\!\pm\!0.2$			309	AUBERT	02	BABR	$e^+e^- ightarrow ~\Upsilon(4S)$
$2.5^{+1.1}_{-0.9}\!\pm\!0.2$			309	AVERY	00	CLE2	$e^+e^- ightarrow ~\Upsilon(4S)$
• • • We do not use	the fo	llowing (data	for averages, fit	s, lin	nits, etc.	• • •
< 32	90		310	ACCIARRI	97 C	L3	
< 5.8	90			BISHAI	96	CLE2	$e^+e^- ightarrow ~\Upsilon(4S)$
<690	90	1	311	ALEXANDER	95	CLE2	Sup. by BISHAI 96
³⁰⁹ Assumes equal pr	oductio	on of B^-	⊢ an	d B^0 at the $arGamma($	4 <i>S</i>).		

³¹⁰ ACCIARRI 97C assumes B^0 production fraction (39.5 ± 4.0%) and B_s (12.0 ± 3.0%). ³¹¹ Assumes equal production of B^+B^- and $B^0\overline{B}^0$ on $\Upsilon(4S)$.

³¹³ ACCIARRI 97C assumes B^0 production fraction (39.5 ± 4.0%) and B_s (12.0 ± 3.0%).

$$\frac{\Gamma(J/\psi(1S)\pi^{+}\pi^{-})/\Gamma_{\text{total}}}{(4.6\pm0.7\pm0.6)\times10^{-5}} \xrightarrow{DOCUMENT ID} \xrightarrow{TECN} COMMENT} e^{+}e^{-} \rightarrow \Upsilon(4S)$$

 314 Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

$\Gamma(J/\psi(1S) ho^0)/\Gamma_{total}$

Г₁₂₇/Г

 Γ_{126}/Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID		TECN	COMMENT	
$1.6 {\pm} 0.6 {\pm} 0.4$	315	AUBERT	03 B	BABR	$e^+e^- \rightarrow \Upsilon(4S)$	
$\bullet~\bullet~\bullet$ We do not use the	following d	ata for averages	, fits	, limits, (etc. • • •	
<25	90	BISHAI	96	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$	
315 Assumes equal production of B^+ and B^0 at the \varUpsilon (4S).						

$\Gammaig(J/\psi(1S)\omegaig)/\Gamma_{ ext{total}}$						Г ₁₂₈ /Г
VALUE	<u>CL%</u>	DOCUMENT ID		<u>TECN</u>	<u>COMMENT</u>	22(1.2)
<2.7 × 10 ⁻⁴	90	BISHAI	96	CLE2	$e^+ e^- \rightarrow$	7(45)
$\Gamma(J/\psi(1S)\phi)/\Gamma_{\text{total}}$						Г ₁₂₉ /Г
VALUE (units 10^{-6})	CL%	DOCUMENT ID		TECN	COMMENT	
<9.2	90 31	⁶ AUBERT	030	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
³¹⁶ Assumes equal produ	ction of B	$^+$ and B^0 at the	r(4	<i>S</i>).		
$\Gamma(J/\psi(1S)\eta'(958))/\eta'(958))/\eta'(958)$	Г _{total}					Г ₁₃₀ /Г
VALUE (units 10 ⁻⁵)	CL%	DOCUMENT ID		TECN	COMMENT	
<6.3	90 31	⁷ AUBERT	030	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
³¹⁷ Assumes equal produ	ction of B	$^+$ and B^0 at the	$r \gamma(4$	<i>S</i>).		
$\Gamma(J/\psi(1S) K^0 \pi^+ \pi^-)$)/Γ _{total}					Г ₁₃₁ /Г
VALUE (units 10^{-4})	-	DOCUMENT ID		TECN	COMMENT	
10.3±3.3±1.5	31	⁸ AFFOLDER	02 B	CDF	<i>р<mark>р</mark> 1.8 Те</i> \	/
318 Uses $B^0 \rightarrow J/\psi(1S)$	K_S^0 decay	as a reference ar	nd B($B^0 \rightarrow 1$	$J/\psi(1S) \kappa^0$	$= 8.3 \times 10^{-4}$.
$\Gamma(J/\psi(1S)K^0\rho^0)/\Gamma_t$	otal					Г ₁₃₂ /Г
VALUE (units 10^{-4})		DOCUMENT ID		TECN	COMMENT	
5.4±2.9±0.9	31	⁹ AFFOLDER	02в	CDF	<i>р</i> <u>р</u> 1.8 Те\	/
319 Uses $B^0 \rightarrow J/\psi(1S)$	K_{S}^{0} decay	as a reference ar	nd B($B^0 \rightarrow 1$	$J/\psi(1S) \kappa^0$	$= 8.3 \times 10^{-4}$.
$\Gamma(J/\psi(1S)K^*(892)^+)$	π ⁻)/Γ _{tc}	otal				Г ₁₃₃ /Г
VALUE (units 10^{-4})	,,	DOCUMENT ID		TECN	COMMENT	
7.7±4.1±1.3	32	²⁰ AFFOLDER	0 2B	CDF	р <u>р</u> 1.8 Те\	/
320 Uses $B^0 \rightarrow J/\psi(1S)$	K^0_{S} decay	as a reference ar	nd B($B^0 \rightarrow 1$	$J/\psi(1S) K^{0}$	$= 8.3 \times 10^{-4}$.
F(////(15) K*(802)0	 π+π−)/	Έ				F104/F
$V(1/1) = (10^{-4})$	<i>,</i> , , , , , , , , , , , , , , , , , ,			TECN	COMMENT	· 134/ ·
$\frac{VALUE (units 10^{-1})}{66+10+11}$	32		0.0 D			/
321 p0 ////1	$() \times (000)$		02B	CDF	pp 1.0 rev	
$\frac{3210 \text{ses } B^0 \rightarrow J/\psi(1)}{12.4 \times 10^{-4}}.$	5) K**(892)° decay as a re	eteren	ice and	$B(B_{\circ} \rightarrow 1)$	$J/\psi(1S)K^{\circ}) =$
$\Gamma(J/\psi(1S)p\overline{p})/\Gamma_{tota}$	1					Г ₁₃₅ /Г
VALUE	<u>CL%</u>	DOCUMENT ID		TECN	<u>COMMENT</u>	
<1.9 × 10 ⁻⁶	90 32	²² AUBERT	0 3K	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
³²² Assumes equal produ	ction of B	$^+$ and B^0 at the	$r \gamma(4$	<i>S</i>).		
$\Gamma ig(J/\psi(1S)\gamma ig)/\Gamma_{ ext{total}}$						Г ₁₃₆ /Г
VALUE (units 10 ⁻⁶)	<u>CL%</u>	DOCUMENT ID		TECN	COMMENT	
<1.6	90 32	²³ AUBERT,B	04⊤	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
³²³ Assumes equal produ	ction of B	$^+$ and B^0 at the	$r \gamma(4$	<i>S</i>).		
		D 40		C	tod. 6 /04	/000F 17 1C
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o://pdg.lbl.gov) Citation: S. Ei

							Г ₁₃₇ /Г
VALUE (units 10^{-4})	CL%		DOCUMENT ID		TECN	COMMENT	•
6.2 ± 0.7 OUR AVER	AGE	~~ ~					
6.7 ± 1.1		324	ABE	03 B	BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$6.9 \pm 1.1 \pm 1.1$		324	AUBERT	02	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$5.0 \pm 1.1 \pm 0.6$		324	RICHICHI	01	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
• • We do not use the	followi	ng d	ata for averages	, fits	, limits,	etc. ● ● ●	
< 8	90	324	ALAM	94	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
<15	90	324	BORTOLETTO)92	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
<28	90	324	ALBRECHT	90J	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
²⁴ Assumes equal produ	ction of	B+	and B^0 at the	$\Upsilon(4$	<i>S</i>).		
$\Gamma(y_{0}(2.5) K^{0}) / \Gamma(1/y_{0})$	(1.5)K	0)					Г127/Г11 6
(\$ (-\$)); (\$) \$ (\$) \$ (\$)	(10)/1)	DOCUMENT ID		TECN	COMMENT	• 15//• 110
182+013+012		325		02	RARR		$\Upsilon(\Lambda S)$
25		·		02	DADI	e e	7 (43)
²³ Assumes equal produ	ction of	B^{+}	and B ^o at the	7(4	5).		
$(\psi(2S)K^+\pi^-)/\Gamma_{to}$	tal						Г ₁₃₈ /Г
/ALUE	CL%		DOCUMENT ID		TECN	COMMENT	
<0.001	90	326	ALBRECHT	90J	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
²⁶ Assumes equal produ	ction of	в+	and B^0 at the	$\Upsilon(4$	<i>S</i>).		、 <i>,</i>
- (ψ(2 <i>S</i>) <i>K</i> *(892) ⁰)/	F total						Г ₁₃₉ /Г
$(ALUF (units 10^{-4}))$	CI %		DOCUMENT ID)	TECN	COMMEN	т
8.0±1.3 OUR AVER		-	<u> </u>	•			
$7.6 \pm 1.1 \pm 1.0$		3	²⁷ RICHICHI	0	1 CLE2	2 e ⁺ e ⁻ -	$\rightarrow \Upsilon(4S)$
$9.0 \pm 2.2 \pm 0.9$		3	²⁸ ABE	98	BO CDF	pp 1.8 7	TeV Ó
• • We do not use the	followi	ng d	ata for averages	, fits	, limits,	etc. • • •	
<19	90	3	²⁹ ALAM	94	4 CLE2	2 Repl. by	RICHICHI 01
		3	²⁹ BORTOLET [.]	TO9	2 CLEO) e ⁺ e ⁻ -	$\rightarrow ~\Upsilon(4S)$
$14 \pm 8 \pm 4$		3	29 AL DECUT			$a^{+}a^{-}$	$\gamma(1c)$
14 ±8 ±4 <23	90	5	- ALBRECHT	90	JJ ARG		$\rightarrow I(43)$
$14 \pm 8 \pm 4$ <23 327 Assumes equal produ	90 ction of	з в+	and B^0 at the	9) 2(4	.S).	6 6 -	$\rightarrow 1(43)$
$14 \pm 8 \pm 4$ <23 327 Assumes equal produ 328 ABE 980 reports [Bi	90 Iction of $(B^0 \rightarrow$	в+ ψ(and <i>B</i> ⁰ at the (25) <i>K</i> *(892) ⁰)	9)	S). $S^+ \rightarrow$	J/w(15)K	(43)
$14 \pm 8 \pm 4$ <23 3^{27} Assumes equal produ 3^{28} ABE 980 reports [B 0.194 + 0.10. We mu]	90 oction of $(B^0 \rightarrow tiply by$	B^+ $\psi(2)$	and B ⁰ at the and Kechi and K ⁰ at the and K ⁰ at the and K ⁰ at the best value B(B ⁺	90 Ƴ(4 ∕[B(<i>I</i> · →	S). $S^+ \rightarrow J/\psi(1S)$	$J/\psi(1S) K$ $K^+)=(9.9)$	(43) +)] =0.908 = $+1.0 \times 10^{-4}$
14 $\pm 8 \pm 4$ <23 327 Assumes equal produ 328 ABE 980 reports [Bi 0.194 \pm 0.10. We mul Our first error is their	90 Iction of $(B^0 \rightarrow$ Itiply by experim	$\psi(z) = \frac{1}{2} B^+$	and B ⁰ at the 2S) K*(892) ⁰)]/ best value B(B ⁺ s error and our s	90 $\Upsilon(4)$ $\Upsilon[B(1)]$ $\Upsilon \rightarrow$ econ	S). $S^+ ightarrow J/\psi(1S)$ id error i	$J/\psi(1S)K$) $K^+){=}(9.9$ s the system	$(43)^{+}$] =0.908 ± ±1.0)×10 ⁻⁴ atic error from
14 $\pm 8 \pm 4$ <23 327 Assumes equal produ 328 ABE 980 reports [Bi 0.194 \pm 0.10. We mul Our first error is their using our best value.	90 ($B^0 \rightarrow$ tiply by experim	δB^+ $\psi(2)$	and B^0 at the $2S) K^* (892)^0]/$ best value $B(B^+$ s error and our s	90 $\Upsilon(4)$ $\Upsilon[B(I)]$ \to econ	S). $S^+ \rightarrow J/\psi(1S)$ and error is	$J/\psi(1S)K$ $)K^+){=}(9.9$ s the system	$(+)] = 0.908 \pm 1.0) \times 10^{-4}$
14 $\pm 8 \pm 4$ <23 327 Assumes equal produ 328 ABE 980 reports [B 0.194 \pm 0.10. We mul Our first error is their using our best value. 329 Assumes equal produ	90 ection of $(B^0 \rightarrow$ tiply by experim ction of	$\psi(z) = B^+$ $\psi(z) = 0$ $\psi(z) = $	and B^0 at the $2S K^* (892)^0)]/$ best value $B(B^+$ s error and our s	90 $\Upsilon(4)$ $\Upsilon(B(I))$ $$ econ $\Upsilon(4)$	S). $S^+ \rightarrow J/\psi(1S)$ d error is S).	$J/\psi(1S)K$) $K^+){=}(9.9$ s the system	$(43)^{+}$] =0.908 ± ±1.0)×10 ⁻⁴ atic error from
14 $\pm 8 \pm 4$ <23 327 Assumes equal produ 328 ABE 980 reports [Bi 0.194 \pm 0.10. We mul Our first error is their using our best value. 329 Assumes equal produ 5($\chi_{e0}(1P) K^0$)/ Γ_{exce}	90 action of $(B^0 \rightarrow$ http://doi.org/10.1000 http	$\psi(x) = B^+$ $\psi(x) = \psi(x)$ our $\psi(x) = 0$ $\psi(x) = 0$	and B^0 at the $2S) K^* (892)^0)]/$ best value $B(B^+$ s error and our s and B^0 at the	90 $\Upsilon(4)$ $\Upsilon(B(I))$ $r \rightarrow$ econ $\Upsilon(4)$	S). $S^+ \rightarrow J/\psi(1S)$ d error is S).	$J/\psi(1S)K$) $K^+){=}(9.9$ s the system	→ $f(43)$ +)] =0.908 ± ±1.0)×10 ⁻⁴ atic error from
14 $\pm 8 \pm 4$ <23 ²²⁷ Assumes equal produ ²²⁸ ABE 980 reports [Bu 0.194 \pm 0.10. We mul Our first error is their using our best value. ²²⁹ Assumes equal produ ⁽²⁹⁾ ($\chi_{c0}(1P) K^0$)/ Γ_{tota}	90 action of $(B^0 \rightarrow tiply by$ experimned action of I	$\psi(2)$ our nent'	and B^0 at the $2S K^* (892)^0)]/$ best value $B(B^+$ is error and our s and B^0 at the	90 $\Upsilon(4)$ $\Upsilon(B(B))$ $T \rightarrow 0$ econ $\Upsilon(4)$	$S).$ $S^{+} \rightarrow$ $J/\psi(1S)$ $d \text{ error if}$ $S).$	$J/\psi(1S) K$ $K^+)=(9.9$ s the system	$(43)^{+}$] =0.908 ± ±1.0)×10 ⁻⁴ atic error fron
14 $\pm 8 \pm 4$ <23 327 Assumes equal produ 328 ABE 980 reports [Bi 0.194 \pm 0.10. We mul Our first error is their using our best value. 329 Assumes equal produ $\Gamma(\chi_{c0}(1P) K^0)/\Gamma_{tota}$ <u>ALUE</u>	90 action of $(B^0 \rightarrow)$ tiply by experim- action of $\frac{1}{90}$	B^+ $\psi(3)$ our linent' B^+ 330	and B^0 at the $2S) K^* (892)^0)]/$ best value $B(B^+$ is error and our s and B^0 at the <u>DOCUMENT ID</u>	90 $\Upsilon(4)$ $\Gamma \rightarrow$ econ $\Upsilon(4)$ 01	$S).$ $S^+ \rightarrow J/\psi(1S)$ $d \text{ error if}$ $S).$ $TECN$ $CIF2$	$J/\psi(1S) K$ $K^+)=(9.9$ s the system COMMENT $e^+e^- \rightarrow$	$(43)^{+}$ (43) $(\pm 1.0) \times 10^{-4}$ atic error fron Γ_{140}/Γ_{7}
14 $\pm 8 \pm 4$ <23 327 Assumes equal produ 328 ABE 980 reports [Bi 0.194 \pm 0.10. We mul Our first error is their using our best value. 329 Assumes equal produ $\Gamma(\chi_{c0}(1P) K^0)/\Gamma_{tota}$ <u>(ALUE</u> <5.0 × 10 ⁻⁴ 330 EDWARDS 01 area	90 action of $(B^0 \rightarrow tiply by experimentary by experimentary by experimentary by experimentary by the second se$	B^+ $\psi(2)$ our linent' B^+ 330	and B^0 at the $2S) K^* (892)^0)]/best value B(B^+)is error and our sand B^0 at theDOCUMENT IDEDWARDSaduction of D^0$	90 $\Upsilon(4)$ Γ \rightarrow econ $\Upsilon(4)$ 01	$S).$ $S^+ \rightarrow$ $J/\psi(1S)$ $d \text{ error if}$ $S).$ $\frac{TECN}{CLE2}$ $B^+ \text{ error if}$	$J/\psi(1S) K$ $K^+)=(9.9$ s the system COMMENT $e^+e^- \rightarrow$	(43) $(+)] = 0.908 \pm 1.0) \times 10^{-4}$ atic error from Γ_{140}/Γ $T(45)$ The constant

$\Gamma(\chi_{c1}(1P)K^0)/\Gamma_{total}$					Г ₁₄₁ /Г
VALUE (units 10^{-4}) CL	.% DOCUMENT IL	כ	TECN	COMMENT	
$4.0^{+1.2}_{-1.0}$ OUR AVERAGE	E				
$4.7\!\pm\!1.5\!\pm\!0.3$	³³¹ AUBERT	02	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$3.4^{+1.7}_{-1.2}{\pm}0.2$	³³² AVERY	00	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
• • • We do not use the fol	llowing data for averag	ges, fits	, limits,	etc. • • •	
<27 90	³³³ ALAM	94	CLE2	$e^+ e^- \rightarrow$	$\Upsilon(4S)$
 ³³¹ AUBERT 02 reports (5.4 0.016. We rescale to our Our first error is their er from using our best value ³³² AVERY 00 reports (3.9 0.016. We rescale to our Our first error is their er from using our best value ³³³ Assumes equal production 	$\begin{array}{l} \pm 1.4 \pm 1.1) \times 10^{-4} \\ \text{r best value } B(\chi_{c1}(1P)) \\ \text{experiment's error and} \\ \text{te. Assumes equal product of } B^+ \\ 1.3 \pm 0.4) \times 10^{-4} \\ \text{for best value } B(\chi_{c1}(1P)) \\ \text{experiment's error and} \\ \text{te. Assumes equal product of } B^+ \\ \text{and } B^0 \\ \text{at t } B^0 \\ \text{for of } B^+ \\ \text{and } B^0 \\ \text{for and} \\ \end{array}$	for $B(\chi) \to \gamma$ our set duction or $B(\chi) \to \gamma$ our set duction he $\varUpsilon(4)$	$J/\psi(1P)$ $J/\psi(1S)$ econd er of B^+ $c_1(1P)$ $J/\psi(1S)$ econd er of B^+ econd er of B^+ $S/\psi(1S)$	$ \rightarrow \gamma J/\psi(1) = (31.6 \pm 5) = (31.6 \pm 5) = (31.6 \pm 5) = (31.6 \pm 5) = \gamma J/\psi(1.5) = (31.6 \pm 5) = (3$	$S)) = 0.273 \pm 2.3) \times 10^{-2}.$ $A = 2.3 \times 10^{-2}$
$\Gamma(\chi_{c1}(1P)K^*(892)^0)/\Gamma$	- total				Г ₁₄₂ /Г
VALUE (units 10^{-4}) CL	.% DOCUMENT IL	כ	TECN	COMMENT	
4.1±1.4±0.3 • • • We do not use the fol	³³⁴ AUBERT llowing data for averag	02 ges, fits	BABR , limits,	$e^+e^- \rightarrow$ etc. • • •	$\Upsilon(4S)$
<21 90	³³⁵ ALAM	94	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
 ³³⁴ AUBERT 02 reports (4.8 0.016. We rescale to our Our first error is their e from using our best value ³³⁵ BORTOLETTO 92 assu 	$3 \pm 1.4 \pm 0.9) \times 10^{-4}$ r best value B($\chi_{c1}(1P)$ experiment's error and me. Assumes equal production	for $B(\chi) \to \gamma$ our set duction of B^+	$z_{c1}(1P)$ $J/\psi(1S)$ econd er of B^+ and B^0	$ ightarrow \gamma J/\psi(1$ $ m (j)) = (31.6 \pm 3)$ $ m (j) = (31.6 \pm 3)$	$\begin{split} S)) &= 0.273 \pm \\ \pm 2.3) \times 10^{-2}. \\ \text{vstematic error} \\ \text{the } \mathcal{T}(4S). \\ S). \end{split}$
$\frac{\Gamma(\chi_{c1}(1P)K^0)}{\Gamma(J/\psi(VALUE))}$	1 5) K⁰) DOCUMENT II	D	TECN	COMMENT	$\Gamma_{141}/\Gamma_{118}$
0.57±0.17±0.04	336 AUBERT	02	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
³³⁶ AUBERT 02 reports 0.66	$5 \pm 0.11 \pm 0.17$ for B(y	$\chi_{c1}(1F)$	$\gamma \rightarrow \gamma_{-}$	$J/\psi(1S)) =$	$0.273 \pm 0.016.$

We rescale to our best value $B(\chi_{c1}(1P) \rightarrow \gamma J/\psi(1S)) = (31.6 \pm 2.3) \times 10^{-2}$. 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 $\Upsilon(4S)$.

$\Gamma(\chi_{c1}(1P)K^*(892)^0)/\Gamma$	$\Gamma_{142}/\Gamma_{141}$			
VALUE	DOCUMENT_ID	TECN	COMMENT	
0.89±0.34±0.17	³³⁷ AUBERT	02 BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
337		$\mathcal{C}(AC)$		

³³⁷ Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

$\Gamma(K^+\pi^-)/\Gamma_{ ext{total}}$					Г ₁₄₃ /Г
VALUE (units 10 ⁻⁵)	CL%	DOCUMENT ID		TECN	COMMENT
1.82 ± 0.08 OUR A	VERAGE				
$1.85\!\pm\!0.10\!\pm\!0.07$		³³⁸ CHAO	04	BELL	$e^+e^- ightarrow ~\Upsilon(4S)$
$1.80^{+0.23}_{-0.21}{}^{+0.12}_{-0.09}$		³³⁸ BORNHEIM	03	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
$1.79\!\pm\!0.09\!\pm\!0.07$		³³⁸ AUBERT	02Q	BABR	$e^+e^- ightarrow ~\Upsilon(4S)$
• • • We do not use t	he followi	ng data for averages	, fits,	limits,	etc. • • •
$2.25\!\pm\!0.19\!\pm\!0.18$		³³⁸ CASEY	02	BELL	Repl. by CHAO 04
$1.93 \substack{+0.34 + 0.15 \\ -0.32 - 0.06}$		³³⁸ ABE	01 H	BELL	Repl. by CASEY 02
$1.67\!\pm\!0.16\!\pm\!0.13$		³³⁸ AUBERT	01E	BABR	Repl. by AUBERT 02Q
< 6.6	90	³³⁹ ABE	00 C	SLD	$e^+e^- \rightarrow Z$
$1.72^{+0.25}_{-0.24}{\pm}0.12$		³³⁸ CRONIN-HEN.	.00	CLE2	Repl. by BORNHEIM 03
$1.5 \begin{array}{c} +0.5 \\ -0.4 \end{array} \pm 0.14$		GODANG	98	CLE2	Repl. by CRONIN- HENNESSY 00
$2.4 \ +1.7 \ \pm 0.2$		³⁴⁰ ADAM	96 D	DLPH	$e^+e^- \rightarrow Z$
< 1.7	90	ASNER	96	CLE2	Sup. by ADAM 96D
< 3.0	90	³⁴¹ BUSKULIC	96V	ALEP	$e^+e^- \rightarrow Z$
< 9	90	³⁴² ABREU	95N	DLPH	Sup. by ADAM 96D
< 8.1	90	³⁴³ AKERS	94L	OPAL	$e^+e^- \rightarrow Z$
< 2.6	90	³⁴⁴ BATTLE	93	CLE2	$e^+e^- ightarrow ~\Upsilon(4S)$
<18	90	ALBRECHT	91 B	ARG	$e^+e^- ightarrow ~\Upsilon(4S)$
< 9	90	³⁴⁵ AVERY	89 B	CLEO	$e^+e^- ightarrow ~\Upsilon(4S)$
<32	90	AVERY	87	CLEO	$e^+e^- ightarrow ~\Upsilon(4S)$

 338 Assumes equal production of B^+ and B^0 at the $\Upsilon(4S).$

³³⁹ABE 00C assumes B(Z $\rightarrow b\overline{b}$)=(21.7 \pm 0.1)% and the B fractions $f_{B^0} = f_{B^+} =$ $(39.7^{+1.8}_{-2.2})\%$ and $f_{B_s} = (10.5^{+1.8}_{-2.2})\%$.

³⁴⁰ ADAM 96D assumes $f_{B0} = f_{B^-} = 0.39$ and $f_{B_s} = 0.12$. Contributions from B^0 and B_s decays cannot be separated. Limits are given for the weighted average of the decay rates for the two neutral *B* mesons. ³⁴¹ BUSKULIC 96V assumes PDG 96 production fractions for B^0 , B^+ , B_s , *b* baryons.

 342 Assumes a B^0 , B^- production fraction of 0.39 and a B_s production fraction of 0.12. Contributions from B^0 and B_s^0 decays cannot be separated. Limits are given for the weighted average of the decay rates for the two neutral *B* mesons. ³⁴³ Assumes B($Z \rightarrow b\overline{b}$) = 0.217 and B_d^0 (B_s^0) fraction 39.5% (12%).

³⁴⁴ BATTLE 93 assumes equal production of $B^{0}\overline{B}^{0}$ and $B^{+}B^{-}$ at $\Upsilon(4S)$. ³⁴⁵ Assumes the $\Upsilon(4S)$ decays 43% to $B^0 \overline{B}^0$.

$$\begin{array}{c} \Gamma(K^+\pi^-)/\Gamma(K^0\pi^0) & & \Gamma_{143}/\Gamma_{144} \\ \hline VALUE & DOCUMENT ID & TECN & COMMENT \\ 1.20^{+0.50}_{-0.58}-0.32 & 346 \text{ ABE} & 01\text{H BELL} & e^+e^- \rightarrow \Upsilon(4S) \end{array}$$

³⁴⁶ Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

$[\Gamma(K^+\pi^-)+\Gamma(\pi^+\pi^-)]$	(Γ ₁₄₃ +Γ ₂₀₂)/Γ				
VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
1.9 ± 0.6 OUR AVERAGE					
$2.8^{+1.5}_{-1.0}{\pm}2.0$		³⁴⁷ ADAM	96 D	DLPH	$e^+e^- \rightarrow Z$
$1.8 \substack{+0.6 + 0.3 \\ -0.5 - 0.4}$	17.2	ASNER	96	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
$\bullet \bullet \bullet$ We do not use the f	ollowing	data for averages, f	its, li	mits, etc	2. ● ● ●
$2.4^{+0.8}_{-0.7}\pm0.2$		³⁴⁸ BATTLE	93	CLE2	$e^+e^- ightarrow ~\Upsilon(4S)$

³⁴⁷ ADAM 96D assumes $f_{B^0} = f_{B^-} = 0.39$ and $f_{B_s} = 0.12$. Contributions from B^0 and B_s decays cannot be separated. Limits are given for the weighted average of the decay rates for the two neutral B mesons. 348 BATTLE 93 assumes equal production of $B^0 \overline{B}^0$ and $B^+ B^-$ at $\Upsilon(4S)$.

$\Gamma(\kappa^0 \pi^0) / \Gamma_{\text{total}}$						Г ₁₄₄ /Г
VALUE (units 10^{-5})	CL%	DOCUMENT ID		TECN	COMMENT	
1.17 ± 0.14 OUR AVE	RAGE					
$1.14\!\pm\!0.17\!\pm\!0.08$		³⁴⁹ AUBERT	04M	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$1.17 {\pm} 0.23 {+} {0.12 \atop -0.13}$		³⁴⁹ CHAO	04	BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$1.28 \substack{+0.40 + 0.17 \\ -0.33 - 0.14}$		³⁴⁹ BORNHEIM	03	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\bullet \bullet \bullet$ We do not use the	ne followir	ng data for average	s, fits	, limits,	etc. • • •	
$0.80^{+0.33}_{-0.31}{\pm}0.16$		³⁴⁹ CASEY	02	BELL	Repl. by C	HAO 04

$0.80 - 0.31 \pm 0.10$		CASET	02 DELL	Repl. by CHAO 04
$1.60\substack{+0.72}{-0.59}\substack{+0.25}{-0.27}$		³⁴⁹ ABE	01H BELL	Repl. by CASEY 02
$0.82^{+0.31}_{-0.27}{\pm}0.12$		³⁴⁹ AUBERT	01e BABR	Repl. by AUBERT 04M
$1.46\substack{+0.59 + 0.24 \\ -0.51 - 0.33}$		349 CRONIN-HEN.	.00 CLE2	Repl. by BORNHEIM 03
<4.1	90	GODANG	98 CLE2	Repl. by CRONIN-
<4.0	90	ASNER	96 CLE2	Rep. by GODANG 98
340 .				

³⁴⁹ Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

			,
VALUE (units 10^{-5})	DOCUMENT ID	TECN	COMMENT
6.3 \pm 0.7 OUR AVERAGE	Error includes scale fa	actor of 1.1.	
$6.06\!\pm\!0.56\!\pm\!0.46$	³⁵⁰ AUBERT	03W BABR	$e^+e^- ightarrow ~\Upsilon(4S)$
$5.5 \ {+1.9 \atop -1.6} \ \pm 0.8$	³⁵⁰ ABE	01M BELL	$e^+e^- ightarrow ~\Upsilon(4S)$
$8.9 \begin{array}{c} +1.8 \\ -1.6 \end{array} \pm 0.9$	³⁵⁰ RICHICHI	00 CLE2	$e^+e^- ightarrow ~\Upsilon(4S)$
\bullet \bullet \bullet We do not use the follow	owing data for average	s, fits, limits,	etc. • • •
$4.2 \ \begin{array}{c} +1.3 \\ -1.1 \end{array} \ \pm 0.4$	³⁵⁰ AUBERT	01g BABR	Repl. by AUBERT 03W
$4.7 \ \begin{array}{c} +2.7 \\ -2.0 \end{array} \pm 0.9$	BEHRENS	98 CLE2	Repl. by RICHICHI 00
250			

 350 Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

 $\Gamma(\eta' K^0) / \Gamma_{\text{total}}$

 Γ_{145}/Γ

$\Gamma(\eta' \kappa^* (892)^0) / \Gamma_{tota}$	I						Г ₁₄₆ /Г	
VALUE (units 10^{-5})	CL%		DOCUMENT ID		TECN	COMMENT		
<0.76	90	351	AUBERT,B	04 D	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$	
• • • We do not use the	followi	ng d	ata for averages	, fits	, limits,	etc. • • •		
<2.4	90	351	RICHICHI	00	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$	
<3.9	90		BEHRENS	98	CLE2	Repl. by R	ICHICHI 00	
³⁵¹ Assumes equal produ	ction of	F B+	and B^0 at the	$\Upsilon(4$	S).			
$\Gamma(\eta K^* (892)^0) / \Gamma_{total}$							Г ₁₄₇ /Г	
VALUE (units 10 ⁻⁵)	<u>CL%</u>		DOCUMENT ID		TECN	COMMENT		
1.77 ± 0.23 OUR AVER	RAGE	352		o 4-		+ -	22(1.5)	
$1.86 \pm 0.23 \pm 0.12$		352	AUBERT,B	04D	BABK	$e^+e^- \rightarrow$	T(4S)	
$1.38^{+0.55}_{-0.46}\pm0.16$		352	RICHICHI	00	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$	
$\bullet \bullet \bullet$ We do not use the	followi	ng d	ata for averages	, fits	, limits,	etc. • • •		
<3.0	90		BEHRENS	98	CLE2	Repl. by R	ICHICHI 00	
³⁵² Assumes equal produ	ction of	ғ <i>в</i> +	and B^0 at the	Υ(4	<i>S</i>).			
				``	,		- /-	
$I(\eta K^{o})/I_{total}$							₁₄₈ /	
VALUE (units 10 ⁻⁶)	CL%		DOCUMENT ID		TECN	COMMENT		
< 5.2	90	353	AUBERT	04H	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$	
 ● We do not use the following data for averages, fits, limits, etc. 								
< 9.3	90	353	RICHICHI	00	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$	
<33	90		BEHRENS	98	CLE2	Repl. by R	ICHICHI 00	
³⁵³ Assumes equal produ	ction of	F <i>B</i> +	and B^0 at the	Υ(4	S).			
$\Gamma(\omega K^0) / \Gamma_{total}$							Г ₁₄₉ /Г	
VALUE (units 10 ⁻⁵)	CL%		DOCUMENT ID		TECN	COMMENT		
$0.55^{+0.12}_{-0.10}$ OUR AVEF	RAGE						-	
$0.59^{+0.16}_{-0.13}{\pm}0.05$		354	AUBERT	04H	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$	
$0.40^{+0.19}_{-0.16}{\pm}0.05$		354	WANG	04A	BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$	
$1.00^{+0.54}_{-0.42}\pm0.14$		354	JESSOP	00	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$	
• • We do not use the	followi	ng d	ata for averages	, fits	, limits,	etc. • • •		
<1.3	90	354	AUBERT	01 G	BABR	Repl. by A	UBERT 04H	
<5.7	90	354	BERGFELD	98	CLE2	Repl. by JI	ESSOP 00	
³⁵⁴ Assumes equal produ	ction of	F <i>В</i> +	and B^0 at the	γ(4	<i>S</i>).			
$\Gamma(a_0^-K^+)/\Gamma_{total}$							Г151 /Г	
$VAIJIE$ (units 10^{-6})	CI %		DOCUMENT ID		TECN	COMMENT	± 3 ±/ -	
<pre>//loc (units 10)</pre>	00	355		04	BARD		$\gamma(\Lambda S)$	
~~.	90		AUDER I,DE	04	DADK	$e \cdot e \rightarrow$	r (43)	
Assumes equal produ	ction of	r cha	rged and neutra	ıВr	nesons f	rom $T(4S)$	decays.	

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 357 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.

$\Gamma(\omega K^*(892)^0)/\Gamma_{total}$

VALUE	CL%	DOCUMENT ID	TECN
<2.3 × 10 ⁻⁵	90	³⁵⁸ BERGFELD 98	CLE2
358			

³⁵⁸ Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

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

 Γ_{154}/Γ

 Γ_{153}/Γ

<i>VALUE</i> (units 10 ⁻⁶)	<u>CL%</u>	DOCUMENT ID		TECN	COMMENT
< 0.6	90	³⁵⁹ AUBERT	02Q	BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$\bullet \bullet \bullet$ We do not use the	followin	ng data for averages	, fits,	limits,	etc. ● ● ●
< 0.7	90	CHAO	04	BELL	$e^+e^- \rightarrow \Upsilon(4S)$
< 0.8	90	³⁵⁹ BORNHEIM	03	CLE2	$e^+e^- ightarrow ~\Upsilon(4S)$
< 0.9	90	³⁵⁹ CASEY	02	BELL	$e^+e^- ightarrow ~\Upsilon(4S)$
< 2.7	90	³⁵⁹ ABE	01 H	BELL	$e^+e^- \rightarrow \Upsilon(4S)$
< 2.5	90	³⁵⁹ AUBERT	01E	BABR	$e^+e^- ightarrow ~\Upsilon(4S)$
< 66	90	³⁶⁰ ABE	00 C	SLD	$e^+e^- \rightarrow Z$
< 1.9	90	³⁵⁹ CRONIN-HEN.	.00	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
< 4.3	90	GODANG	98	CLE2	Repl. by CRONIN-
< 46		³⁶¹ ADAM	96 D	DLPH	$\begin{array}{c} \text{HENNESSY 00} \\ e^+ e^- \rightarrow Z \end{array}$
< 4	90	ASNER	96	CLE2	Repl. by GODANG 98
< 18	90	³⁶² BUSKULIC	96v	ALEP	$e^+e^- \rightarrow Z$
<120	90	³⁶³ ABREU	95N	DLPH	Sup. by ADAM 96D
< 7	90	³⁶⁴ BATTLE	93	CLE2	$e^+e^- ightarrow ~\Upsilon(4S)$

 359 Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

³⁶⁰ABE 00C assumes B($Z \rightarrow b\overline{b}$)=(21.7 ± 0.1)% and the B fractions $f_{B0}=f_{B^+}=$ $(39.7^{+1.8}_{-2.2})\%$ and $f_{B_s} = (10.5^{+1.8}_{-2.2})\%$.

³⁶¹ ADAM 96D assumes $f_{B^0} = f_{B^-} = 0.39$ and $f_{B_s} = 0.12$. Contributions from B^0 and B_s decays cannot be separated. Limits are given for the weighted average of the decay rates for the two neutral *B* mesons. ³⁶² BUSKULIC 96V assumes PDG 96 production fractions for B^0 , B^+ , B_s , *b* baryons.

 363 Assumes a B^0 , B^- production fraction of 0.39 and a B_s production fraction of 0.12. Contributions from B^0 and B^0_s decays cannot be separated. Limits are given for the weighted average of the decay rates for the two neutral *B* mesons.

³⁶⁴ BATTLE 93 assumes equal production of $B^0 \overline{B}{}^0$ and $B^+ B^-$ at $\Upsilon(4S)$.

$\Gamma(K^0\overline{K}^0)/\Gamma_{total}$							Г ₁₅₅ /Г
VALUE	<u>CL%</u>		DOCUMENT ID		TECN	COMMENT	
<1.5 × 10 ^{—6}	90	365	CHAO	04	BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
• • We do not use t	he follow	ving da	ata for averages	s, fits	, limits,	etc. • • •	
$< 1.8 \times 10^{-6}$	90	365	AUBERT	0 4№	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$<3.3 \times 10^{-0}$	90	365	BORNHEIM	03	CLE2	$e^+e^- \rightarrow + -$	$\Upsilon(4S)$
$<4.1 \times 10^{-5}$	90 90	000		02 08	BELL CLE2	$e^+e^- \rightarrow$	T(4S) T(4S)
365 Assumes equal prov	duction (,f ₽+	and B^0 at the	$r(\lambda$	S)	e e	7(43)
		יש ת		: / (4	5).		F /F
$VALUE (units 10^{-6})$	al .		DOCUMENT ID		TECN	COMMENT	156/1
4.2 ^{+1.6} +0.8		366	GARMASH	04	BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
366 Assumes equal prov	duction (f B+	and B^0 at the	ς γ	S)		((0))
		ים ת		: / (4	5).		F /F
$\frac{ (\Lambda'\pi\pi^*)/ _{\text{total}}}{ (\Lambda'\pi\pi^*)/ _{\text{total}}}$	CI 0/		DOCUMENT ID		TECN	COMMENT	157/1
36 6+4.2 ± 3 0	<u>CL %</u>	367		04	RELI		$\Upsilon(AS)$
-4.3 ± 3.0	he follow	ing di	ta for average	04 s fits	limits	$e^{+}e^{-} \rightarrow e^{+}e^{-}$	7 (43)
< 40	90	367 3	FCKHART	02	CLF2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
367 Assumes equal prov	duction (f R ⁺	and B^0 at the	ς γ	5)		(10)
Assumes equal proc			and <i>D</i> at the	: / (4	5).		
$\Gamma(K^+ \rho^-) / \Gamma_{\text{total}}$							Г ₁₅₈ /Г
VALUE (units 10^{-6})	<u>CL%</u>		DOCUMENT ID		TECN	COMMENT	
8.5±2.8 OUR AVE	RAGE	Error	includes scale f	factor	r of 1.7.		
15.1 + 3.4 + 2.4 -3.3 - 2.6		308	CHANG	04	BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$7.3^{+1.3}_{-1.2}{\pm}1.3$		368	AUBERT	03T	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
• • • We do not use t	he follow	ving da	ata for average	s, fits	, limits,	etc. • • •	
<32	90	368	JESSOP	00	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
<35	90		ASNER	96	CLE2	Repl. by J	ESSOP 00
³⁶⁸ Assumes equal proc	duction c	of B^+	and B^0 at the	r(4	<i>S</i>).		
$\Gamma((K^+\pi^-\pi^0)$ non-	resonar	nt)/Γ	total				Г ₁₅₉ /Г
VALUE (units 10^{-6})	CL%		DOCUMENT ID		TECN	COMMENT	
<9.4	90	369	CHANG	04	BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
³⁶⁹ Assumes equal proc	duction o	of B^+	and B^0 at the	r(4	S).		
$\Gamma(K_{\star}^{*0}\pi^{0})/\Gamma_{total}$							Г ₁₆₀ /Г
K_{*0}^{*0} stands for t	he possił	ole cai	ndidates of K^*	(1410)), K*(1	.430) and <i>K</i>	*(1430).
<i>x</i> VALUE (units 10 ⁻⁶)	•		DOCUMENT ID		TECN	, COMMENT	۷` ٬
6.1+1.6+0.5		370	CHANG	04	BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
-1.5-U.0	-l	(D+		~ ~ (-	C)		× /
••• Assumes equal proc	juction c	of B^{\perp}	and B° at the	e I (4	5).		
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					0,00		

$\Gamma(\kappa^0\pi^+\pi^-)/\Gamma_{ m total}$						Г ₁₆₁ /Г
VALUE (units 10^{-6})	CL%	DOCUMENT ID		TECN	COMMENT	
45 \pm 4 OUR AV	ERAGE					
$43.7 \pm \ 3.8 \pm 3.4$		³⁷¹ AUBERT,B	040	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$45.4\pm~5.2\pm5.9$		³⁷¹ GARMASH	04	BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
50 $\substack{+10\\-9}$ ±7		³⁷¹ ECKHART	02	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
• • • We do not use the	e follow	ing data for averages	s, fits	, limits,	etc. • • •	
<440	90	ALBRECHT	91E	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
³⁷¹ Assumes equal produ	uction o	f B^+ and B^0 at the	γ(4	<i>S</i>).		
Г <i>(и</i> 0 "0) /Г						Г/Г

$\Gamma(\kappa^0 \rho^0) / \Gamma_{\text{total}}$						Γ ₁	₆₂ /Г
VALUE	<u>CL%</u>	DOCUMENT ID		TECN	COMMENT		
<3.9 × 10 ⁻⁵	90	ASNER	96	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$	
$\bullet \bullet \bullet$ We do not use	the follow	ing data for average	s, fits	, limits,	etc. • • •		
$< 3.2 \times 10^{-4}$	90	ALBRECHT	91 B	ARG	$e^+ e^- \rightarrow$	$\Upsilon(4S)$	
$< 5.0 \times 10^{-4}$	90	³⁷² AVERY	89 B	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$	
<0.064	90	³⁷³ AVERY	87	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$	
³⁷² AVERY 89B repor	ts < 5.8	$ imes$ 10 $^{-4}$ assuming t	he γ	`(4 <i>S</i>) de	ecays 43% t	o B ⁰ B ⁰	We
373 AVEDV 07				400/			

 $^{3/3}$ AVERY 87 reports < 0.08 assuming the $\Upsilon(4S)$ decays 40% to $B^0\overline{B}^0$. We rescale to 50%.

$\Gamma(\kappa^0 f_0(980))/\Gamma_{total}$

Γ_{163}/Γ

Г₁₆₄/Г

VALUE	CL%	DOCUMENT ID		TECN	COMMENT		
<3.6 × 10 ⁻⁴	90	³⁷⁴ AVERY	89 B	CLEO	$e^+e^- ightarrow ~\gamma(2)$	<i>\$\$</i>)	
³⁷⁴ AVERY 89B reports	< 4.2	$ imes$ 10 $^{-4}$ assuming t	the γ	(4 <i>S</i>) de	cays 43% to B ⁽	⁾ B ⁰ .	We
rescale to 50%.							

$\Gamma(K^*(892)^+\pi^-)/\Gamma_{total}$

VALUE (units 10^{-6})	CL%	DOCUMENT ID		TECN	COMMENT	
13.8±2.2 OUR AVER	AGE					
$12.9\!\pm\!2.4\!\pm\!1.4$		³⁷⁵ AUBERT,B	040	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$14.8 \substack{+4.6 + 2.8 \\ -4.4 - 1.3}$		³⁷⁵ CHANG	04	BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$16 \ {+6 \atop -5} \ \pm 2$		³⁷⁵ ECKHART	02	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\bullet \bullet \bullet$ We do not use the	followi	ng data for averages,	, fits,	limits,	etc. • • •	
< 72	90	ASNER	96	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
<620	90	ALBRECHT	91 B	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
<380	90	³⁷⁶ AVERY	89 B	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
<560	90	³⁷⁷ AVERY	87	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
375 Assumes equal produc	ction of	B^+ and B^0 at the	$\gamma(4$	5)		

³⁷⁵ Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. ³⁷⁶ AVERY 89B reports $< 4.4 \times 10^{-4}$ assuming the $\Upsilon(4S)$ decays 43% to $B^0 \overline{B}^0$. We rescale to 50%.

³⁷⁷ AVERY 87 reports $< 7 \times 10^{-4}$ assuming the $\Upsilon(4S)$ decays 40% to $B^0 \overline{B}^0$. We rescale to 50%.

 $\Gamma(K_{x}^{*+}\pi^{-})/\Gamma_{\text{total}}$ Γ_{165}/Γ K_{\star}^{*+} stands for the possible candidates of $K^{*}(1410)$, $K_{0}^{*}(1430)$ and $K_{2}^{*}(1430)$. DOCUMENT ID TECN COMMENT VALUE (units 10^{-6}) $5.1 \pm 1.5 \substack{+0.6 \\ -0.7}$ ³⁷⁸ CHANG 04 BELL $e^+e^- \rightarrow \Upsilon(4S)$ ³⁷⁸ Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. $\Gamma(K^*(892)^0\pi^0)/\Gamma_{\text{total}}$ Γ_{166}/Γ <u>DOCUM</u>ENT ID VALUE TECN COMMENT CL% 04 BELL $e^+e^- \rightarrow \Upsilon(4S)$ <3.5 × 10⁻⁶ 90 379 CHANG • • • We do not use the following data for averages, fits, limits, etc. • • • $< 3.6 \times 10^{-6}$ 90 ²⁶⁶ JESSOP 00 CLE2 $e^+e^- \rightarrow \Upsilon(4S)$ $< 2.8 \times 10^{-5}$ 90 ASNER 96 CLE2 Repl. by JESSOP 00 ³⁷⁹ Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. $\Gamma(K_2^*(1430)^+\pi^-)/\Gamma_{total}$ Γ_{167}/Γ VALUE DOCUMENT ID TECN COMMENT CL% ³⁸⁰ GARMASH $<1.8 \times 10^{-5}$ 04 BELL $e^+e^- \rightarrow \Upsilon(4S)$ 90 • • • We do not use the following data for averages, fits, limits, etc $< 2.6 \times 10^{-3}$ 90 ALBRECHT 91B ARG $e^+e^- \rightarrow \Upsilon(4S)$ 380 Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. $\Gamma(K^0K^-\pi^+)/\Gamma_{\text{total}}$ Γ_{168}/Γ VALUE DOCUMENT ID TECN COMMENT <u>CL%</u> $< 21 \times 10^{-6}$ ³⁸¹ ECKHART 02 CLE2 $e^+e^- \rightarrow \Upsilon(4S)$ 90 ³⁸¹ Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. $\Gamma(K^+K^-\pi^0)/\Gamma_{\rm total}$ Γ_{169}/Γ DOCUMENT ID TECN COMMENT VALUE <u>CL%</u> <19 × 10⁻⁶ ³⁸² ECKHART 90 02 CLE2 $e^+e^- \rightarrow \Upsilon(4S)$ ³⁸²Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. $\Gamma(K^0K^+K^-)/\Gamma_{\text{total}}$ Γ_{170}/Γ *VALUE* (units 10^{-6}) DOCUMENT ID TECN COMMENT CL% 24.7±2.3 OUR AVERAGE 383 AUBERT,B 04V BABR $e^+e^- \rightarrow \Upsilon(4S)$ $23.8\!\pm\!2.0\!\pm\!1.6$ ³⁸³ GARMASH 04 BELL $e^+e^- \rightarrow \Upsilon(4S)$ $28.3\!\pm\!3.3\!\pm\!4.0$ \bullet \bullet \bullet We do not use the following data for averages, fits, limits, etc. \bullet \bullet $e^+e^- \rightarrow \Upsilon(4S)$ 90 ALBRECHT 91e ARG <1300 ³⁸³Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

$\Gamma(\kappa^0 \phi) / \Gamma_{\text{total}}$							Г ₁₇₁ /Г
VALUE (units 10 ⁻⁶)	CL%		DOCUMENT ID		TECN	COMMENT	
$8.6^{+1.3}_{-1.1}$ our ave	ERAGE						
$8.4^{+1.5}_{-1.3}{\pm}0.5$		384	^I AUBERT	04A	BABR	$e^+e^- ightarrow$	$\Upsilon(4S)$
$9.0^{+2.2}_{-1.8}{\pm}0.7$		385	CHEN	03 B	BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\bullet \bullet \bullet$ We do not use the	e follow	ing c	lata for average	s, fits	, limits,	etc. • • •	
$8.1^{+3.1}_{-2.5}{\pm}0.8$		385	AUBERT	01 D	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
< 12.3 < 31	90 90	385 385	BRIERE BERGFELD	01 98	CLE2 CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
< 88	90		ASNER	96	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
< 720	90	204	ALBRECHT	91 B	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
< 420	90	387	AVERY	89B	CLEO	$e^+e^- \rightarrow + -$	$\Upsilon(4S)$
<1000	90	501	AVERY	87	CLEO	$e^+ e^- \rightarrow$	T(4S)
387 AVERY 89B reports rescale to 50%. 387 AVERY 87 reports < to 50%. $\Gamma(K^-\pi^+\pi^+\pi^-)/\Gamma$.	< 4.9 1.3×1	× 10 0-3) ' assuming t assuming the γ	he 7 `(4 <i>5</i>)	(45) de	ecays 43% t 40% to B ⁰ E	ο Βο Βο. We 30. We rescale
			DOCUMENT ID		TECN	COMMENT	۱ <i>7</i> 2/۱
$<23 \times 10^{-4}$	<u> 00</u>	388	³ adam	06 D	DI PH		7
• • • We do not use the	e follow	ing c	lata for average	s. fits	, limits,	etc. • • •	L
$< 2.1 \times 10^{-4}$	90	389	ABREU	95N		Sup by Al	DAM 96D
388 ADAM 06D assumes	f	f	-0.30 and f		0.12 (Contributions	$f_{rom} = R^0$ and
B_s decays cannot be	'B ^{0 —} e separa	' <i>B</i> - ted.	$L = 0.59$ and T_E Limits are given	3 _s — 1 for	the weig	shted averag	e of the decay
rates for the two neu 389 A second provide 00 0	itral B	mesc	ons.	I	- D		tion - f 0 12
Contributions from weighted average of	produc B ⁰ and the dec	B_s^0 ay ra	decays cannot tes for the two	and be se neuti	a <i>B_S</i> pr eparated ral <i>B</i> me	roduction fra . Limits are esons.	e given for the
$\Gamma(K^*(892)^0\pi^+\pi^-)/$	Γ _{total}				TECN	COMMENT	Г ₁₇₃ /Г
<u>VALUE</u>	<u> </u>			01-		\pm –	22(4.5)
<1.4 × 10 ³	90		ALBRECHT	91E	ARG	$e \cdot e \rightarrow$	7 (45)
$\Gamma(K^*(892)^0\rho^0)/\Gamma_{\rm tot}$	al				TECN	COMMENT	Г ₁₇₄ /Г
value	<u> </u>	300	CODANG	00		\pm –	22(4.6)
< 3.4 × 10 °	90 followi	ing a	r GUDANG	02 fita	CLE2	$e \cdot e \rightarrow$	1 (45)
$<2.86 \times 10^{-4}$	90	391	ABE	00C	SLD	$e^+e^- \rightarrow$	Ζ

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90

90

90

 ${<}4.6\ \times 10^{-4}$

 ${<}5.8\ \times10^{-4}$

 $< 9.6 \times 10^{-4}$

ALBRECHT ³⁹² AVERY

³⁹³ AVERY

 $e^+e^- \rightarrow \Upsilon(4S)$

89B CLEO $e^+e^- \rightarrow \Upsilon(4S)$

87 CLEO $e^+e^- \rightarrow \Upsilon(4S)$

91b ARG

 390 Assumes a helicity 00 configuration. For a helicity 11 configuration, the limit decreases

to 2.4×10^{-5} . 391 ABE 00C assumes B(Z $\rightarrow b\overline{b}$)=(21.7 \pm 0.1)% and the B fractions $f_{B^0}=f_{B^+}=$ $(39.7^{+1.8}_{-2.2})\%$ and $f_{B_s} = (10.5^{+1.8}_{-2.2})\%$.

- 392 AVERY 89B reports $< 6.7 \times 10^{-4}$ assuming the $\Upsilon(4S)$ decays 43% to $B^0 \overline{B}^0$. We rescale to 50%. 393
- AVERY 87 reports $< 1.2 \times 10^{-3}$ assuming the $\Upsilon(4S)$ decays 40% to $B^0 \overline{B}^0$. We rescale to 50%.

$\Gamma(K^*(892)^0 f_0(980))$	/Γ _{tota}	I			Г ₁₇₅ /Г
VALUE	CL%	DOCUMENT ID	TECN	COMMENT	
<1.7 × 10 ⁻⁴	90	³⁹⁴ AVERY	89b CLEO	$e^+ e^- \rightarrow$	$\Upsilon(4S)$
³⁹⁴ AVERY 89B reports rescale to 50%.	< 2.0	$ imes 10^{-4}$ assuming	the $\Upsilon(4S)$ de	ecays 43% t	o B ⁰ B ⁰ . We
$\Gamma(K_1(1400)^+\pi^-)/\Gamma$	total				Г ₁₇₆ /Г
VALUE	CL%	DOCUMENT ID	TECN	COMMENT	

<1.1 × 10 ⁻³	90	ALBRECHT	91B ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\Gamma(K^{-}a_{1}(1260)^{+})/$	Γ _{total}				Г ₁₇₇ /Г
VALUE	<u>CL%</u>	DOCUMENT ID	TECN	COMMENT	
<2.3 × 10 ⁻⁴	90	³⁹⁵ ADAM	96D DLPH	$e^+ e^- \rightarrow$	Ζ
• • • We do not use	the follow	ing data for averages	s, fits, limits,	etc. • • •	
${<}3.9 imes10^{-4}$	90	³⁹⁶ ABREU	95N DLPH	Sup. by Al	DAM 96D
205					•

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³⁹⁵ ADAM 96D assumes $f_{B^0} = f_{B^-} = 0.39$ and $f_{B_s} = 0.12$. Contributions from B^0 and B_s decays cannot be separated. Limits are given for the weighted average of the decay rates for the two neutral B mesons.

³⁹⁶ Assumes a B^0 , B^- production fraction of 0.39 and a B_s production fraction of 0.12. Contributions from B^0 and B^0_s decays cannot be separated. Limits are given for the weighted average of the decay rates for the two neutral B mesons.

Γ(<i>K</i> *(892) ^o <i>K</i> + <i>K</i> -	⁻)/Γ _{tota}	I			Г ₁₇₈ /Г
VALUE	CL%	DOCUMENT ID	TECN	COMMENT	
<6.1 × 10 ⁻⁴	90	ALBRECHT	91e ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\Gamma(K^*(892)^0\phi)/\Gamma_{to}$	tal				Г ₁₇₉ /Г
VALUE (units 10^{-6})	CL%	DOCUMENT ID	TECN	COMMENT	
9.5±0.9 OUR AV	ERAGE				
$9.2\!\pm\!0.9\!\pm\!0.5$		³⁹⁷ AUBERT,B	04W BAB	$R \ e^+ e^- \rightarrow$	$\Upsilon(4S)$
$10.0^{+1.6}_{-1.5}{}^{+0.7}_{-0.8}$		³⁹⁷ CHEN	03b BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$11.5^{+4.5+1.8}_{-3.7-1.7}$		³⁹⁷ BRIERE	01 CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
• • • We do not use	the follow	ing data for averages	s, fits, limit	s, etc. • • •	
$11.2 \pm 1.3 \pm 0.8$		³⁹⁷ AUBERT	03V BABI	R Repl. by AUBER	2T,B 04W
$8.7^{+2.5}_{-2.1}\pm1.1$		³⁹⁷ AUBERT	01D BAB	R Repl. by A	UBERT 03V
<384 < 21	90 90	³⁹⁸ ABE ³⁹⁷ BERGFELD	00C SLD 98 CLE2	$e^+e^- \rightarrow 2$	Ζ

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< 43	90	ASNER	96 CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
<320	90	ALBRECHT	91b ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
<380	90	³⁹⁹ AVERY	89b CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
<380	90	⁴⁰⁰ AVERY	87 CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
		-			

³⁹⁷ Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

³⁹⁸ABE 00C assumes B(Z $\rightarrow b\overline{b}$)=(21.7 \pm 0.1)% and the B fractions $f_{B^0}=f_{B^+}=$ $(39.7^{+1.8}_{-2.2})\%$ and $f_{B_s} = (10.5^{+1.8}_{-2.2})\%$.

 399 AVERY 89B reports $< 4.4 \times 10^{-4}$ assuming the $\Upsilon(4S)$ decays 43% to $B^0 \overline{B}^0$. We rescale to 50%.

 $400 \text{ AVERY 87 reports} < 4.7 \times 10^{-4}$ assuming the $\Upsilon(4S)$ decays 40% to $B^0 \overline{B}^0$. We rescale to 50%.

$\Gamma(\overline{K}^{*}(892)^{0}K^{*}(892)^{0})/\Gamma_{total}$

Γ_{180}/Γ

 Γ_{181}/Γ

 Γ_{182}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<2.2 × 10 ⁻⁵	90	401 GODANG	02	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
\bullet \bullet \bullet We do not use the	followi	ng data for averages	, fits	, limits,	etc. ● ● ●
$< 4.69 \times 10^{-4}$	90	⁴⁰² ABE	00 C	SLD	$e^+e^- \rightarrow Z$

 401 Assumes a helicity 00 configuration. For a helicity 11 configuration, the limit decreases

to 1.9×10^{-5} . 402 ABE 00C assumes B(Z $\rightarrow b\overline{b}$)=(21.7 \pm 0.1)% and the B fractions $f_{B^0}=f_{B^+}=$ $(39.7^{+1.8}_{-2.2})\%$ and $f_{B_s} = (10.5^{+1.8}_{-2.2})\%$.

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<3.7 × 10 ⁻⁵	90	403 GODANG	02	CLE2	$e^+e^- ightarrow ~\Upsilon(4S)$

⁴⁰³ Assumes a helicity 00 configuration. For a helicity 11 configuration, the limit decreases to 2.9×10^{-5} .

$\Gamma(K^{*}(892)^{+}K^{*}(892)^{-})/\Gamma_{total}$

VALUE	ČL%	DOCUMENT ID	TECN	COMMENT
<1.41 × 10 ⁻⁴	90	404 GODANG 02	CLE2	$e^+e^- ightarrow ~\Upsilon(4S)$
101				

 404 Assumes a helicity 00 configuration. For a helicity 11 configuration, the limit decreases to 8.9×10^{-5} .

$\Gamma(K_1(1400)^0 \rho^0) / \Gamma_{to}$	tal				Г ₁₈₃ /Г	
VALUE	CL%	DOCUMENT ID	TECN	COMMENT		
<3.0 × 10 ⁻³	90	ALBRECHT	91b ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$	
$\Gamma(\kappa_1(1400)^0\phi)/\Gamma_{\rm tot}$	al				Г ₁₈₄ /Г	
VALUE	CL%	DOCUMENT ID	TECN	COMMENT		
<5.0 × 10 ⁻³	90	ALBRECHT	91b ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$	
$\Gamma(K_0^*(1430)^0\phi)/\Gamma_{\text{total}}$						
VALUE		DOCUMENT ID	TECN	<u>COMMENT</u>		
seen		⁴⁰⁵ AUBERT,B	04w BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$	
$^{405}\text{Observed}$ 181 \pm 17 $_{\odot}$	events v	with statistical signifi	cance greater	r than 10 σ .		

$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	$(n_2(1430)^{\circ} \rho^{\circ})/(t_{t_1})$	otal	DOCUMENT ID		TECN	COMMENT	186/1
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	<1.1 × 10 ⁻³	<u>90</u>	ALBRECHT	91 B	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$\Gamma(K^*(1A30)^0 A) / \Gamma$						Г. o= /Г
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$\psi(n_2(1+30) \psi)/\psi(n_1)$		DOCUMENT ID		TECN	COMMENT	' 187/'
The ADBERT, B = 04W BARK $e^{-1} = -1/(43)$ • • We do not use the following data for averages, fits, limits, etc. • • • $<1.4 \times 10^{-3}$ 90 ALBRECHT 91B ARG $e^+e^- \rightarrow T(45)$ 406 The angular distribution of $B \rightarrow \phi K^*(1430)$ provides evidence with statistical significance of 3.2 σ. F(K*(892)⁰ γ)/F_{total} F(K*(892)⁰ γ)/F_{total} F(K*(8) γ) F(fotal F(K*(8) γ) F(fotal F(K*(7)) F(fotal F	VALUE	<u>CL%</u>	406 AURERT P	0.414/			$\Upsilon(AC)$
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⁴⁰⁶ The angular distribution of <i>B</i> → φ <i>K</i> *(1430) provides evidence with statistical significance of 3.2 σ. F(K*(892)⁰ γ)/Γ_{total} F(K*(892)⁰ γ)/Γ_{total} F(K*(9) F(K*(9) F(1) F(1)	$< 1.4 \times 10^{-3}$	90	ALBRECHT	91 B	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
	406 The angular distribu cance of 3.2 σ .	tion of <i>E</i>	$B ightarrow \phi K^*$ (1430) p	rovide	es evider	nce with sta	tistical signifi
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$\Gamma(K^*(892)^0\gamma)/\Gamma_{tota}$	1					Г ₁₈₈ /Г
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4.01±0.21±0.17 4.05±0.7±0.73 4.05±0.763±0.34 409 COAN 409 COAN 400 CLE2 $e^+e^- \rightarrow \Upsilon(45)$ • • We do not use the following data for averages, fits, limits, etc. • • • < 11 4.23±0.40±0.22 408 AUBERT 4.23±0.40±0.22 408 AUBERT 4.23±0.40±0.22 408 AUBERT 4.23±0.40±0.22 408 AUBERT 4.23±0.40±0.22 408 AUBERT 4.23±0.40±0.22 408 AUBERT 4.22 BOD LPH $e^+e^- \rightarrow Z$ 4.0±1.7±0.8 411 AMMAR 4.0±1.7±0.8 411 AMMAR 4.0±1.7±0.8 411 AMMAR 4.0±1.7±0.8 411 AMMAR 4.0±1.7±0.8 411 AMMAR 4.0±1.7±0.8 411 AMMAR 4.0±1.7±0.8 411 AMMAR 4.0±1.7±0.8 411 AMMAR 4.0±1.7±0.8 411 AMMAR 4.0±1.7±0.8 411 AMMAR 4.0±1.7±0.8 412 AVERY 409 Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. No evidence for a nonresonan $K\pi\gamma$ contamination was seen; the central value assumes no contamination. 410 ADAM 410 ADAM 410 ADAM 410 ADAM 410 ADAM 412 AVERY 413 DRUTSKOY 413 DRUTSKOY 413 DRUTSKOY 414 Assumes equal production of B^+ and B^0 at $\Upsilon(4S)$ decays 43% to $B^0\overline{B}^0$. W rescale to 50%. F($(K^+\pi^-\gamma)/\Gamma_{total}$ 413 Assumes equal production of B^+ and B^0 at $\Upsilon(4S)$. F($(K^+\pi^-\gamma)/\Gamma_{total}$ 414 Assumes equal production of B^+ and B^0 at $\Upsilon(4S)$. F($(K^+\pi^-\gamma)/\Gamma_{total}$ 415 NISHIDA 416 $E^+e^- \rightarrow \Upsilon(4S)$ 417 Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. 418 Assumes equal production of B^+ and B^0 at $\Upsilon(4S)$. 419 Assumes equal production of B^+ and B^0 at $\Upsilon(4S)$. 410 ADAM 412 AVERY 413 Assumes equal production of B^+ and B^0 at $\Upsilon(4S)$. 414 Assumes equal production of B^+ and B^0 at $\Upsilon(4S)$. 415 $E^- \rightarrow \Upsilon(4S)$ 414 Assumes equal production of B^+ and B^0 at $\Upsilon(4S)$. 415 $E^- \rightarrow \Upsilon(4S)$ 414 Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. 415 $E^- \rightarrow \Upsilon(4S)$ 414 Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. 415 $E^- \rightarrow \Upsilon(4S)$ 415 $E^- \rightarrow \Upsilon(4S)$ 416 $E^- \rightarrow \Upsilon(4S)$. 417 $E^- \rightarrow \Upsilon(4S)$ 417 $E^- \rightarrow \Upsilon(4S)$ 418 $E^- \rightarrow \Upsilon(4S)$ 419 $E^- \rightarrow \Upsilon(4S)$ 419 $E^- \rightarrow \Upsilon(4S)$ 419 $E^- \rightarrow \Upsilon(4S)$ 419 $E^- \rightarrow \Upsilon(4S)$ 410 $E^- \rightarrow \Upsilon(4S)$ 410 $E^- \rightarrow$	$3.92 \pm 0.20 \pm 0.24$		⁴⁰⁷ AUBERT,BE	04/	ABABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$4.55^{+0.72}_{-0.68} \pm 0.34 \qquad 409 \text{ COAN} \qquad 00 \text{CLE2} e^+e^- \rightarrow \Upsilon(4S)$ • • We do not use the following data for averages, fits, limits, etc. • • • $< 11 \qquad 90 \qquad \text{ACOSTA} \qquad 026 \text{ CDF} p\overline{p} \text{ at } 1.8 \text{ TeV} \\ 4.23\pm 0.40\pm 0.22 \qquad 408 \text{ AUBERT} \qquad 02C \text{ BABR} \text{Repl. by} \\ AUBERT, BE 04A \qquad 408 \text{ AUBERT} \qquad 02C \text{ BABR} \text{Repl. by} \\ AUBERT, BE 04A \qquad 400 \pm 1.7 \pm 0.8 \qquad 411 \text{ AMMAR} 93 \text{CLE2} \text{Repl. by} \text{ COAN} \text{ 00} \\ < 42 \qquad 90 \qquad \text{ALBRECHT} 896 \text{ ACEO} e^+e^- \rightarrow \Upsilon(4S) \\ < 24 \qquad 90 \qquad 412 \text{ AVERY} \qquad 898 \text{ CLEO} e^+e^- \rightarrow \Upsilon(4S) \\ < 210 \qquad 90 \qquad \text{AVERY} \qquad 87 \text{CLEO} e^+e^- \rightarrow \Upsilon(4S) \\ < 210 \qquad 90 \qquad \text{AVERY} \qquad 87 \text{CLEO} e^+e^- \rightarrow \Upsilon(4S) \\ ^{409} \text{ Assumes equal production of } B^+ \text{ and } B^0 \text{ at the } \Upsilon(4S). \text{ No evidence for a nonresonan} \\ K\pi\gamma \text{ contamination was seen; the central value assumes no contamination.} \\ ^{410} \text{ ADAM} 96D \text{ assumes } f_{B0} = f_{B^-} = 0.39 \text{ and } f_{B_s} = 0.12. \\ ^{411} \text{ AMMAR 93 observed } 6.6 \pm 2.8 \text{ events above background.} \\ ^{412} \text{ AVERY} 898 \text{ reports} < 2.8 \times 10^{-4} \text{ assuming the } \Upsilon(4S) \text{ decays } 43\% \text{ to } B^0\overline{B^0}. \text{ W} \\ \text{ rescale to } 50\%. \\ \mathbf{\Gamma(K^0 \phi \gamma)/\Gamma_{total}} \qquad \mathbf{\Gammaable M}^{DOCUMENT \ ID} \qquad \mathbf{TECN} \underline{COMMENT} \\ ^{413} \text{ Assumes equal production of } B^+ \text{ and } B^0 \text{ at } \Upsilon(4S). \\ \mathbf{\Gamma(4.6^+ \pi^- \gamma)/\Gamma_{total}} \qquad \underline{DOCUMENT \ ID} \qquad \underline{TECN} \underline{COMMENT} \\ ^{414} \text{ Assumes equal production of } B^+ \text{ and } B^0 \text{ at } \Upsilon(4S). \\ \mathbf{F(4.5^+ \pi^- \gamma)/\Gamma_{total}} \qquad \underline{DOCUMENT \ ID} \qquad \underline{TECN} \underline{COMMENT} \\ ^{414} \text{ Assumes equal production of } B^+ \text{ and } B^0 \text{ at } \Upsilon(4S). \\ \mathbf{F(4.5^+ \pi^- \gamma)/\Gamma_{total}} \qquad \underline{DOCUMENT \ ID} \qquad \underline{TECN} \underline{COMMENT} \\ ^{414} \text{ Assumes equal production of } B^+ \text{ and } B^0 \text{ at } \Upsilon(4S). \\ \mathbf{F(4.5^+ \pi^- \gamma)/\Gamma_{total}} \qquad \underline{DOCUMENT \ ID} \qquad \underline{TECN} \underline{COMMENT} \\ ^{414} \text{ Assumes equal production of } B^+ \text{ and } B^0 \text{ at } \Upsilon(4S). \\ \mathbf{F(4.5^+ \pi^- \gamma)} (4.5^+ \mu^- \rightarrow \Upsilon(4.5)). \\ \mathbf{F(4.5^+ \pi^- \gamma)} (4.5^+ \mu^- \rightarrow \Upsilon(4.5)). \\ \mathbf{F(4.5^+ \pi^- \gamma)} (4.5^+ \mu^- \rightarrow (4.5^+ \mu^- \rightarrow \Upsilon(4.5)). \\ F(4.5^+$	$4.01\!\pm\!0.21\!\pm\!0.17$		⁴⁰⁸ NAKAO	04	BELL	$e^+e^- ightarrow$	$\Upsilon(4S)$
••• We do not use the following data for averages, fits, limits, etc. ••• < 11 90 ACOSTA 02G CDF $p\bar{p}$ at 1.8 TeV 4.23±0.40±0.22 408 AUBERT 02C BABR Repl. by AUBERT,BE 04A < 21 90 410 ADAM 96D DLPH $e^+e^- \rightarrow Z$ 4.0±1.7±0.8 411 AMMAR 93 CLE2 Repl. by COAN 00 < 42 90 ALBRECHT 89G ARG $e^+e^- \rightarrow \Upsilon(4S)$ <24 90 412 AVERY 89B CLEO $e^+e^- \rightarrow \Upsilon(4S)$ <210 90 AVERY 87 CLEO $e^+e^- \rightarrow \Upsilon(4S)$ 407 Uses the production ratio of charged and neutral B from $\Upsilon(4S)$ decays $R^{+/0} = 1.006 \pm 0.048$. 408 Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. No evidence for a nonresonan $K \pi \gamma$ contamination was seen; the central value assumes no contamination. 410 ADAM 96D assumes $f_{B0} = f_{B^-} = 0.39$ and $f_{B_S} = 0.12$. 411 AMMAR 93 observed 6.6 ± 2.8 events above background. 412 AVERY 89B reports < 2.8 × 10 ⁻⁴ assuming the $\Upsilon(4S)$ decays 43% to $B^0 \overline{B}^0$. W rescale to 50%. F ($K^0 \phi \gamma$)/ F total DOCUMENT ID TECN COMMENT <8.3 90 413 DRUTSKOY 04 BELL $e^+e^- \rightarrow \Upsilon(4S)$ 413 Assumes equal production of B^+ and B^0 at $\Upsilon(4S)$. F ($K^+\pi^-\gamma$)/ F total DOCUMENT ID TECN COMMENT (ADMMENT 144 Assumes equal production of B^+ and B^0 at $\Upsilon(4S)$. F ($K^+\pi^-\gamma$)/ F total DOCUMENT ID TECN COMMENT (4.6 + 1.3 + 0.5) X 10 ⁻⁶ 414,415 NISHIDA 02 BELL $e^+e^- \rightarrow \Upsilon(4S)$ 414 Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. 415 1.25 GeV/ $r^2 \leq M_{LC} < 1.6 GeV/r^2$	$4.55^{+0.72}_{-0.68}\pm0.34$		⁴⁰⁹ COAN	00	CLE2	$e^+e^- ightarrow$	$\Upsilon(4S)$
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$< 24 \qquad 90 \qquad 412 \text{ AVERY} \qquad 89B \text{ CLEO } e^+e^- \rightarrow \Upsilon(4S)$ $< 210 \qquad 90 \qquad \text{AVERY} \qquad 87 \text{CLEO } e^+e^- \rightarrow \Upsilon(4S)$ $407 \text{ Uses the production ratio of charged and neutral B from } \Upsilon(4S) \text{ decays } \mathbb{R}^{+/0} = 1.006 \pm 0.048.$ $408 \text{ Assumes equal production of } B^+ \text{ and } B^0 \text{ at the } \Upsilon(4S).$ $409 \text{ Assumes equal production of } B^+ \text{ and } B^0 \text{ at the } \Upsilon(4S).$ $409 \text{ Assumes equal production of } B^+ \text{ and } B^0 \text{ at the } \Upsilon(4S).$ $409 \text{ Assumes equal production of } B^+ \text{ and } B^0 \text{ at the } \Upsilon(4S).$ $409 \text{ Assumes equal production of } B^+ \text{ and } B^0 \text{ at the } \Upsilon(4S).$ $409 \text{ Assumes equal production of } B^+ \text{ and } B^0 \text{ at the } \Upsilon(4S).$ $410 \text{ ADAM 96D assumes } f_{B^0} = f_{B^-} = 0.39 \text{ and } f_{B_s} = 0.12.$ $411 \text{ AMMAR 93 observed } 6.6 \pm 2.8 \text{ events above background.}$ $412 \text{ AVERY 89B reports } < 2.8 \times 10^{-4} \text{ assuming the } \Upsilon(4S) \text{ decays } 43\% \text{ to } B^0\overline{B}^0.$ $W \text{ rescale to } 50\%.$ $\Gamma(K^0 \phi \gamma)/\Gamma_{\text{total}} \qquad \Gamma_{189}/I$ $\frac{VALUE (\text{ units } 10^{-6})}{(413 \text{ DRUTSKOY } 04 \text{ BELL}} \qquad COMMENT \ e^+e^- \rightarrow \Upsilon(4S)$ $413 \text{ Assumes equal production of } B^+ \text{ and } B^0 \text{ at } \Upsilon(4S).$ $\Gamma(46^+\pi^-\gamma)/\Gamma_{\text{total}} \qquad DOCUMENT ID \qquad TECN COMMENT \ e^+e^- \rightarrow \Upsilon(4S)$ $414 \text{ Assumes equal production of } B^+ \text{ and } B^0 \text{ at } \Upsilon(4S).$ $414 \text{ Assumes equal production of } B^+ \text{ and } B^0 \text{ at the } \Upsilon(4S).$ $414 \text{ Assumes equal production of } B^+ \text{ and } B^0 \text{ at the } \Upsilon(4S).$ $414 \text{ Assumes equal production of } B^+ \text{ and } B^0 \text{ at the } \Upsilon(4S).$	< 42	90	ALBRECHT	890	G ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
<210 90 AVERY 87 CLEO $e^+e^- \rightarrow \Upsilon(4S)$ 407 Uses the production ratio of charged and neutral B from $\Upsilon(4S)$ decays $R^{+/0} = 1.006 = 0.048$. 408 Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. 409 Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. No evidence for a nonresonan $K \pi \gamma$ contamination was seen; the central value assumes no contamination. 410 ADAM 96D assumes $f_{B^0} = f_{B^-} = 0.39$ and $f_{B_s} = 0.12$. 411 AMMAR 93 observed 6.6 ± 2.8 events above background. 412 AVERY 89B reports < 2.8×10^{-4} assuming the $\Upsilon(4S)$ decays 43% to $B^0 \overline{B}^0$. W rescale to 50%. F ($K^0 \phi \gamma$)/ F total VALUE (units 10 ⁻⁶) CL% DOCUMENT ID TECN COMMENT COMMENT AULUE DOCUMENT ID TECN COMMENT COMMENT COMMENT COMMENT COUMENT ID TECN COMMENT COMMENT COMMENT COUMENT ID TECN COMMENT COMMENT COMMENT COUMENT ID TECN COMMENT COMMENT COUMENT ID COUMENT ID COUMENT ID COUMENT ID COUMENT ID COUMENT ID COUMENT COUMENT ID COUMENT COU	< 24	90	⁴¹² AVERY	89E	B CLEO	$e^+e^- ightarrow$	$\Upsilon(4S)$
⁴⁰⁷ Uses the production ratio of charged and neutral B from <i>Υ</i> (4 <i>S</i>) decays R ^{+/0} = 1.006 = 0.048. ⁴⁰⁸ Assumes equal production of <i>B</i> ⁺ and <i>B</i> ⁰ at the <i>Υ</i> (4 <i>S</i>). ⁴⁰⁹ Assumes equal production of <i>B</i> ⁺ and <i>B</i> ⁰ at the <i>Υ</i> (4 <i>S</i>). No evidence for a nonresonan <i>K</i> π <i>γ</i> contamination was seen; the central value assumes no contamination. ⁴¹⁰ ADAM 96D assumes $f_{B^0} = f_{B^-} = 0.39$ and $f_{B_s} = 0.12$. ⁴¹¹ AMMAR 93 observed 6.6 ± 2.8 events above background. ⁴¹² AVERY 89B reports < 2.8 × 10 ⁻⁴ assuming the <i>Υ</i> (4 <i>S</i>) decays 43% to $B^0 \overline{B}^0$. W rescale to 50%. Γ (<i>K</i> ⁰ φ <i>γ</i>)/ Γ total ^{VALUE} (units 10 ⁻⁶) <u>CL%</u> <u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u> TECN COMMENT 413 DRUTSKOY 04 BELL $e^+e^- \rightarrow \Upsilon(4S)$ ⁴¹³ Assumes equal production of <i>B</i>⁺ and <i>B</i>⁰ at <i>Υ</i>(4<i>S</i>). Γ(<i>K</i>⁺ π⁻ <i>γ</i>)/Γtotal <u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u> (4.6 + 1.3 + 0.5) × 10⁻⁶ 414,415 NISHIDA 02 BELL $e^+e^- \rightarrow \Upsilon(4S)$ ⁴¹⁴ Assumes equal production of <i>B</i>⁺ and <i>B</i>⁰ at the <i>Υ</i>(4<i>S</i>). ⁴¹⁵ 1.25 GeV/<i>r</i>² < <i>Mνε</i> < 1.6 GeV/<i>r</i>²	<210	90	AVERY	87	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
0.048. 408 Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. 409 Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. No evidence for a nonresonan $K \pi \gamma$ contamination was seen; the central value assumes no contamination. 410 ADAM 96D assumes $f_{B^0} = f_{B^-} = 0.39$ and $f_{B_s} = 0.12$. 411 AMMAR 93 observed 6.6 ± 2.8 events above background. 412 AVERY 89B reports $< 2.8 \times 10^{-4}$ assuming the $\Upsilon(4S)$ decays 43% to $B^0 \overline{B}^0$. W rescale to 50%. $\Gamma(K^0 \phi \gamma)/\Gamma_{\text{total}}$ VALUE (units 10^{-6}) $CL\%$ g_0 $413 \frac{DOCUMENT ID}{DRUTSKOY}$ $04 \frac{TECN}{BELL}$ $COMMENT$ $e^+e^- \rightarrow \Upsilon(4S)$ 413 Assumes equal production of B^+ and B^0 at $\Upsilon(4S)$. $\Gamma(K^+\pi^-\gamma)/\Gamma_{\text{total}}$ $DOCUMENT ID$ $TECN$ $COMMENT$ $(4.6^+1.3^+0.5) \times 10^{-6}$ $414,415$ NISHIDA 02 BELL $e^+e^- \rightarrow \Upsilon(4S)$ 414 Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. $\Gamma(45)$ $\Gamma(45)$. $\Gamma(45)$ $\Gamma(45)$. $\Gamma(45)$ $\Gamma(45)$.	⁴⁰⁷ Uses the production	ratio of o	harged and neutral	B fror	n $\Upsilon(4S$) decays R ⁺	$-/0 = 1.006 \pm$
⁴⁰⁶ Assumes equal production of <i>B</i> ⁺ and <i>B</i> ⁰ at the <i>Υ</i> (4 <i>S</i>). ⁴⁰⁹ Assumes equal production of <i>B</i> ⁺ and <i>B</i> ⁰ at the <i>Υ</i> (4 <i>S</i>). No evidence for a nonresonan <i>K</i> πγ contamination was seen; the central value assumes no contamination. ⁴¹⁰ ADAM 96D assumes $f_{B^0} = f_{B^-} = 0.39$ and $f_{B_s} = 0.12$. ⁴¹¹ AMMAR 93 observed 6.6 ± 2.8 events above background. ⁴¹² AVERY 89B reports < 2.8 × 10 ⁻⁴ assuming the <i>Υ</i> (4 <i>S</i>) decays 43% to $B^0 \overline{B}^0$. W rescale to 50%. Γ (<i>K</i> ⁰ <i>φ</i> γ)/ Γ total ⁴¹³ DRUTSKOY 04 BELL $e^+e^- \rightarrow \Upsilon(4S)$ ⁴¹³ Assumes equal production of <i>B</i> ⁺ and <i>B</i> ⁰ at <i>Υ</i> (4 <i>S</i>). Γ (<i>K</i> ⁺ π ⁻ γ)/ Γ total ^{414,415} NISHIDA 02 BELL $e^+e^- \rightarrow \Upsilon(4S)$ ⁴¹⁴ Assumes equal production of <i>B</i> ⁺ and <i>B</i> ⁰ at the <i>Υ</i> (4 <i>S</i>). ⁴¹⁴ Assumes equal production of <i>B</i> ⁺ and <i>B</i> ⁰ at the <i>Υ</i> (4 <i>S</i>). ⁴¹⁴ Assumes equal production of <i>B</i> ⁺ and <i>B</i> ⁰ at the <i>Υ</i> (4 <i>S</i>). ⁴¹⁴ Assumes equal production of <i>B</i> ⁺ and <i>B</i> ⁰ at the <i>Υ</i> (4 <i>S</i>).	0.048.					, ,	
⁴⁰⁹ Assumes equal production of B ⁺ and B ⁰ at the T(4S). No evidence for a nonresonan Kπγ contamination was seen; the central value assumes no contamination. ⁴¹⁰ ADAM 96D assumes $f_{B^0} = f_{B^-} = 0.39$ and $f_{B_s} = 0.12$. ⁴¹¹ AMMAR 93 observed 6.6 ± 2.8 events above background. ⁴¹² AVERY 89B reports < 2.8 × 10 ⁻⁴ assuming the T(4S) decays 43% to B ⁰ B ⁰ . W rescale to 50%. Γ (K ⁰ φγ)/ Γ _{total} <u>VALUE (units 10⁻⁶)</u> C L% 90 413 DRUTSKOY 04 BELL $e^+e^- \rightarrow T(4S)$ ⁴¹³ Assumes equal production of B ⁺ and B ⁰ at T(4S). Γ (K ⁺ π ⁻ γ)/ Γ _{total} <u>VALUE</u> 1 25 GeV/c ² ≤ M _K ≤ 1.6 GeV/c ²	408 Assumes equal produ 400	uction of	B^+ and B^0 at the	$\Upsilon(43)$	5).		
$f_{B} = f_{B^-} = 0.39 \text{ and } f_{B_s} = 0.12.$ $f_{B} = f_{B^-} = 0.39 \text{ and } f_{B_s} = 0.12.$ $f_{B} = 0.12.$ $f_{A} = $	⁴⁰⁹ Assumes equal produ	uction of	B^+ and B^0 at the	$\Upsilon(45)$	5). No e	evidence for	a nonresonan
$\frac{1}{B} = \frac{1}{B} = -\frac{1}{B} = $	$410 \Delta D \Delta M$ 96D assumes	f = -1	$f = 0.39$ and $f_{\rm D}$	assun	12 10 1	ontaminatio	n.
$\frac{112}{412} \text{ AVERY 89B reports} < 2.8 \times 10^{-4} \text{ assuming the } \Upsilon(4S) \text{ decays } 43\% \text{ to } B^0 \overline{B}^0. \text{ W}$ rescale to 50%. $\Gamma(K^0 \phi \gamma)/\Gamma_{\text{total}} \qquad \Gamma_{189}/I$ $\frac{VALUE (\text{units } 10^{-6})}{<8.3} \qquad \frac{CL\%}{90} \qquad \frac{DOCUMENT ID}{413} \frac{DOCUMENT ID}{DRUTSKOY} \qquad \frac{TECN}{BELL} \qquad \frac{COMMENT}{e^+e^- \rightarrow} \Upsilon(4S)$ $\frac{413}{P} \text{ Assumes equal production of } B^+ \text{ and } B^0 \text{ at } \Upsilon(4S).$ $\Gamma(K^+ \pi^- \gamma)/\Gamma_{\text{total}} \qquad DOCUMENT ID \qquad TECN \qquad COMMENT$ $\frac{VALUE}{(4.6 + 1.3 + 0.5)} \times 10^{-6} \qquad 414,415 \text{ NISHIDA} \qquad 02 \text{ BELL} \qquad e^+e^- \rightarrow \Upsilon(4S)$ $\frac{414}{P} \text{ Assumes equal production of } B^+ \text{ and } B^0 \text{ at the } \Upsilon(4S).$		$B^{0} = 1$	$B^{-} = 0.05$ and B_{2}	, — 0.			
$\Gamma(K^{0}\phi\gamma)/\Gamma_{\text{total}} \qquad \Gamma_{189}/I$ $\frac{VALUE (\text{units } 10^{-6})}{<8.3} \qquad \frac{CL\%}{90} \qquad \frac{DOCUMENT ID}{413} \frac{TECN}{DRUTSKOY} \qquad \frac{COMMENT}{e^+e^- \rightarrow \Upsilon(4S)}$ $\frac{TECN}{e^+e^- \rightarrow \Upsilon(4S)} \qquad \frac{CL\%}{e^+e^- \rightarrow \Upsilon(4S)}$ $\frac{TI}{13} \text{ Assumes equal production of } B^+ \text{ and } B^0 \text{ at } \Upsilon(4S).$ $\Gamma(K^+\pi^-\gamma)/\Gamma_{\text{total}} \qquad \frac{DOCUMENT ID}{POCUMENT ID} \qquad \frac{TECN}{2} \qquad \frac{COMMENT}{2}$ $\frac{COMMENT}{(4.6^+1.3^+0.5) \times 10^{-6}} \qquad 414,415 \text{ NISHIDA} \qquad 02 \text{ BELL } e^+e^- \rightarrow \Upsilon(4S)$ $\frac{114}{25} \text{ GeV}/c^2 \leq M_{LC} \leq 1.6 \text{ GeV}/c^2$	412 MIMAR 93 observe	d 6.6 ±	2.8 events above ba	ckgro	und. (45) da	covic 120/ t	$PO\overline{D}O$ W
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	rescale to 50%.	< 2.0 /	assuming t		(43) ue	Cays 45/0 0	$\mathbf{D}^{-}\mathbf{D}^{-}$. We
VALUE (units 10^{-6})CL%DOCUMENT IDTECNCOMMENT<8.3	$\Gamma(K^0\phi\gamma)/\Gamma_{ ext{total}}$						Г ₁₈₉ /Г
<8.3 90 413 DRUTSKOY 04 BELL $e^+e^- \rightarrow \Upsilon(4S)$ ⁴¹³ Assumes equal production of B^+ and B^0 at $\Upsilon(4S)$. $\Gamma(K^+\pi^-\gamma)/\Gamma_{\text{total}}$ Γ_{190}/I <u>VALUE</u> DOCUMENT ID TECN COMMENT (4.6 $^+1.3+0.5$) × 10 ⁻⁶ 414,415 NISHIDA 02 BELL $e^+e^- \rightarrow \Upsilon(4S)$ ⁴¹⁴ Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. ⁴¹⁵ 1.25 GeV/ $c^2 \leq M_{42} \leq 1.6$ GeV/ c^2	<i>VALUE</i> (units 10 ⁻⁶)	<u>C</u> L%	<u>DO</u> CUMENT ID		<u>TE</u> CN	<u>COMMENT</u>	
⁴¹³ Assumes equal production of B^+ and B^0 at $\Upsilon(4S)$. $\Gamma(K^+\pi^-\gamma)/\Gamma_{\text{total}} \qquad \qquad \Gamma_{190}/I$ $\xrightarrow{VALUE} \qquad \qquad DOCUMENT ID \qquad TECN \qquad COMMENT$ $(4.6^{+1.3+0.5}_{-1.2-0.7}) \times 10^{-6} \qquad 414,415 \text{ NISHIDA} \qquad 02 \text{ BELL } e^+e^- \rightarrow \Upsilon(4S)$ $\overset{414}{} \text{Assumes equal production of } B^+ \text{ and } B^0 \text{ at the } \Upsilon(4S).$ $\overset{414}{} \text{Assumes equal production of } B^+ \text{ and } B^0 \text{ at the } \Upsilon(4S).$	<8.3	90	413 DRUTSKOY	04	BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\Gamma(K^{+}\pi^{-}\gamma)/\Gamma_{\text{total}} \qquad \Gamma_{190}/I$ $\frac{VALUE}{(4.6^{+}1.3^{+}0.5)} \times 10^{-6} \qquad 4^{14,415} \text{ NISHIDA} \qquad 02 \text{BELL} e^{+}e^{-} \rightarrow \Upsilon(4S)$ $\frac{4^{14}}{4^{15}} \text{ Assumes equal production of } B^{+} \text{ and } B^{0} \text{ at the } \Upsilon(4S).$	⁴¹³ Assumes equal produ	uction of	B^+ and B^0 at $\Upsilon($	4 <i>S</i>).			(-)
$\frac{DOCUMENT ID}{14.6^{+1.3}_{-1.2}^{+0.5}} \times 10^{-6} \qquad 4^{14,415} \text{ NISHIDA} \qquad 0^{2} \text{ BELL} e^{+}e^{-} \rightarrow \Upsilon(4S)$ $\frac{4^{14}}{4^{15}} \text{ Assumes equal production of } B^{+} \text{ and } B^{0} \text{ at the } \Upsilon(4S).$	$\Gamma(K^+\pi^-\gamma)/\Gamma_{\rm total}$						[100/[
(4.6 ^{+1.3+0.5}) × 10 ⁻⁶ 414,415 NISHIDA 02 BELL $e^+e^- \rightarrow \Upsilon(4S)$ ⁴¹⁴ Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. ⁴¹⁵ 1.25 GeV/ $c^2 \leq M_{42} \leq 1.6$ GeV/ c^2	VALUE		DOCUMENT ID		TECN	COMMENT	- 130/ -
⁴¹⁴ Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. ⁴¹⁵ 1 25 GeV/ $c^2 \leq M_{12} \leq 1.6$ GeV/ c^2	$(4.6^{+1.3}_{-1.2}^{+0.5}_{-0.7}) \times 10^{-6}$	414	⁴¹⁵ NISHIDA	02	BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
415 1 25 GeV/ $c^2 < M_{cc} < 1.6 GeV/c^2$	414 Assumes equal produ	iction of	B^+ and B^0 at the	$\gamma(\Lambda)$	5)		
	$415_{1.25}$ CaV/ $c^2 > M_{\odot}$		$C = V/c^2$	1 (43	<i>.</i>		

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$\Gamma(K^*(1410)\gamma)/\Gamma_{total}$							Г ₁₉₁ /Г
VALUE	<u>CL%</u>	116	DOCUMENT ID		TECN	COMMENT	
<1.3 × 10	90	410	NISHIDA	02	BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
⁴¹⁶ Assumes equal produc	ction of	B^+	and B^0 at the	$\Upsilon(4)$	<i>S</i>).		
$\Gamma(K^+\pi^-\gamma \text{ nonresona})$	nt)/Γ _t	otal					Г ₁₉₂ /Г
VALUE	<u>CL%</u>		DOCUMENT ID		TECN	<u>COMMENT</u>	
<2.6 × 10 ⁻⁶	90 417,	418	NISHIDA	02	BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
417 Assumes equal product $^{418}_{1.25}~{\rm GeV}/c^2 < \!\! M_{K\pi}$	ction of < 1.6 G	B+ ieV/	and B^0 at the c^2	Υ(4	<i>S</i>).		
$\Gamma(K_1(1270)^0\gamma)/\Gamma_{tota}$	1						Г ₁₉₃ /Г
VALUE	<u>CL%</u>		DOCUMENT ID		TECN	COMMENT	
<0.0070	90	419	ALBRECHT	89 G	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
⁴¹⁹ ALBRECHT 89G report rescale to 50%.	orts < (0.00	78 assuming th	eΥ	(4 <i>S</i>) de	cays 45% to	⊳ <i>В⁰ В</i> ⁰ . We
$\Gamma(K_1(1400)^0\gamma)/\Gamma_{\text{tota}}$	1						Г ₁₉₄ /Г
VALUE	<u>CL%</u>		DOCUMENT ID		TECN	COMMENT	
<0.0043	90	420	ALBRECHT	89 G	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
⁴²⁰ ALBRECHT 89G report rescale to 50%.	orts < (0.00	48 assuming th	eΥ	(4 <i>S</i>) de	cays 45% to	o B ⁰ B ⁰ . We
$\Gamma(K_2^*(1430)^0\gamma)/\Gamma_{tota}$	ı						Г ₁₉₅ /Г
VALUE (units 10 ⁻⁵)	CL%		DOCUMENT ID		TECN	COMMENT	
1.24 ± 0.24 OUR AVE	RAGE	401					
$1.22 \pm 0.25 \pm 0.10$		421 421	AUBERT,B	04U	BABR	$e^+e^- \rightarrow \pm -$	$\Upsilon(4S)$
$1.3 \pm 0.5 \pm 0.1$	fallaria	721	NISHIDA	02	BELL		
• • • we do not use the		~ ~	to for overage	fite	limite		$\Upsilon(4S)$
	TOHOWIN	g da ₄ວວ	ata for averages,	, fits,	, limits,	etc. • • •	$\Upsilon(4S)$
<40	90	g da 422	ata for averages, ALBRECHT	, fits, 89G	, limits, ARG	etc. • • • $e^+e^- \rightarrow$	$\Upsilon(4S)$ $\Upsilon(4S)$
<40 ⁴²¹ Assumes equal product ⁴²² ALBRECHT 89G report rescale to 50%.	90 ction of orts $<$ 4.	g da 422 <i>B</i> + 4 ×	ata for averages, ALBRECHT and B ⁰ at the 10 ^{—4} assuming	fits, 89G $\Upsilon(4)$ the	, limits, ARG <i>S</i>). Υ(4 <i>S</i>) α	etc. • • • $e^+e^- \rightarrow$ decays 45%	$\Upsilon(4S)$ $\Upsilon(4S)$ to $B^0 \overline{B}{}^0$. We
<40 421 Assumes equal product 422 ALBRECHT 89G report rescale to 50%. $\Gamma(\kappa^*(1680)^0\gamma)/\Gamma_{total}$	90 $rtion of$ orts < 4.	g da 422 <i>B</i> + 4 ×	ata for averages, ALBRECHT and B ⁰ at the 10 ^{—4} assuming	, fits, 89G Υ(4 the	, limits, ARG <i>S</i>). Υ(4 <i>S</i>) α	etc. • • • $e^+e^- \rightarrow$ decays 45%	$\Upsilon(4S)$ $\Upsilon(4S)$ to $B^0 \overline{B}{}^0$. We Γ_{196}/Γ
<40 ⁴²¹ Assumes equal product ⁴²² ALBRECHT 89G report rescale to 50%. Γ(<i>K</i> *(1680) ⁰ γ)/Γ _{total} VALUE	90 ction of orts < 4.	g da 422 <i>B</i> + 4 ×	ata for averages, ALBRECHT and B ⁰ at the 10 ⁻⁴ assuming <u>DOCUMENT ID</u>	, fits, 89G Υ(4. the	, limits, ARG <i>S</i>). <i>Υ</i> (4 <i>S</i>) α <u>TECN</u>	etc. • • • $e^+e^- \rightarrow$ decays 45%	$\Upsilon(4S)$ $\Upsilon(4S)$ to $B^0 \overline{B}{}^0$. We Γ_{196}/Γ
<40 ⁴²¹ Assumes equal product ⁴²² ALBRECHT 89G report rescale to 50%. Γ(<i>K</i> *(1680) ⁰ γ)/Γ _{tota} <u>VALUE</u> <0.0020	90 ction of orts < 4.	g da 422 <i>B</i> + 4 ×	ata for averages, ALBRECHT and B ⁰ at the 10 ⁻⁴ assuming <u>DOCUMENT ID</u> ALBRECHT	, fits, 89G Υ(4 the 89G	, limits, ARG <i>S</i>). <i>Υ</i> (4 <i>S</i>) α <u><i>TECN</i></u> ARG	etc. • • • $e^+e^- \rightarrow$ decays 45% <u>COMMENT</u> $e^+e^- \rightarrow$	$\frac{\Upsilon(4S)}{\Upsilon(4S)}$ to $B^0 \overline{B}{}^0$. We $\frac{\Gamma_{196}/\Gamma}{\Upsilon(4S)}$
<40 ⁴²¹ Assumes equal product ⁴²² ALBRECHT 89G report rescale to 50%. Γ(<i>K</i>*(1680)⁰γ)/Γ_{total} <u>VALUE</u> <0.0020 ⁴²³ ALBRECHT 89G report rescale to 50%.	90 ction of orts < 4. $\frac{CL\%}{90}$	g d: 422 <i>B</i> ⁺ 4 × 423 0.00	ata for averages, ALBRECHT and B ⁰ at the 10 ⁻⁴ assuming <u>DOCUMENT ID</u> ALBRECHT 22 assuming th	, fits, 89G $\Upsilon(4)$ the 89G e Υ	, limits, ARG S). $\Upsilon(4S)$ o $\frac{TECN}{}$ ARG (4S) de	etc. • • • $e^+e^- \rightarrow$ decays 45% $\frac{COMMENT}{e^+e^- \rightarrow}$ cays 45% to	$T(4S)$ $T(4S)$ to $B^0 \overline{B}^0$. We Γ_{196}/Γ $T(4S)$ to $B^0 \overline{B}^0$. We
<40 421 Assumes equal product 422 ALBRECHT 89G reported rescale to 50%. $\Gamma(K^*(1680)^0 \gamma)/\Gamma_{total}$ VALUE <0.0020 423 ALBRECHT 89G reported rescale to 50%. $\Gamma(K_3^*(1780)^0 \gamma)/\Gamma_{total}$ VALUE	90 ction of orts < 4. $\frac{L}{2}$ 90 orts < 0 $\frac{1}{2}$ $\frac{L}{2}$	g d: 422 <i>B</i> ⁺ 4 × 423 0.00	ata for averages, ALBRECHT and B ⁰ at the 10 ⁻⁴ assuming <u>DOCUMENT ID</u> ALBRECHT 22 assuming th	, fits, 89G Υ (4 the 89G e Υ)	, limits, ARG S). $\Upsilon(4S)$ of <u>TECN</u> (4S) de TECN	etc. • • • $e^+e^- \rightarrow$ decays 45% $\frac{COMMENT}{e^+e^- \rightarrow}$ cays 45% to COMMENT	$\Upsilon(4S)$ $\Upsilon(4S)$ to $B^0 \overline{B}^0$. We Γ_{196}/Γ $\overline{\Upsilon(4S)}$ to $B^0 \overline{B}^0$. We Γ_{197}/Γ
<40 421 Assumes equal product 422 ALBRECHT 89G repor- rescale to 50%. Γ(<i>K</i>*(1680)⁰γ)/Γ_{tota} <u>VALUE</u> <0.0020 423 ALBRECHT 89G repor- rescale to 50%. Γ(<i>K</i>*(1780)⁰γ)/Γ_{tota} <u>VALUE</u> <0.010	90 ction of rts < 4. $\frac{l}{CL\%}$ 90 rts < 0 $\frac{l}{CL\%}$ 90	g da 422 <i>B</i> ⁺ 4 × 423 0.00	ata for averages, ALBRECHT and B ⁰ at the 10 ⁻⁴ assuming <u>DOCUMENT ID</u> ALBRECHT 22 assuming th <u>DOCUMENT ID</u> ALBRECHT	, fits, 89G γ(4 the 89G e γ	, limits, ARG S). $\Upsilon(4S)$ o $\frac{TECN}{}$ ARG (4S) de $\frac{TECN}{}$ ARG	etc. • • • $e^+e^- \rightarrow$ decays 45% $\frac{COMMENT}{e^+e^- \rightarrow}$ cays 45% to $\frac{COMMENT}{e^+e^- \rightarrow}$	$T(4S)$ $T(4S)$ to $B^0 \overline{B}^0$. We Γ_{196}/Γ $T(4S)$ to $B^0 \overline{B}^0$. We Γ_{197}/Γ $T(4S)$

$\Gamma(K^*(2045)^0 \sim) / \Gamma_{1}$					Γ100/Γ
VALUE	CL%	DOCUMENT ID	TECN	COMMENT	• 190/ •
<0.0043	90	425 ALBRECHT 89G	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
⁴²⁵ ALBRECHT 89G rescale to 50%.	reports $<$	0.0048 assuming the γ	(4 <i>S</i>) de	ecays 45% t	$B^0 \overline{B}^0$. We
$\Gamma(\rho^0\gamma)/\Gamma_{\text{total}}$	<i>C</i> 1 <i>%</i>	DOCUMENT ID	TECN	COMMENT	Г ₁₉₉ /Г
$\sim 0.4 \times 10^{-6}$	00	426 ALIBERT OF	<u>TECN</u>	$\frac{COMMENT}{2}$	$\gamma(AS)$
• • • We do not use	90 the followi	ing data for averages. fits	s. limits.	etc. $\bullet \bullet \bullet$	7 (43)
$< 1.2 \times 10^{-6}$	90	426 AUBERT 04C	BABR		$\Upsilon(4S)$
$<1.7 \times 10^{-5}$	90	⁴²⁶ COAN 00	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
⁴²⁶ Assumes equal pro	duction o	f B^+ and B^0 at the $arphi(4)$	1 <i>5</i>).		~ /
$\Gamma(\omega\gamma)/\Gamma_{ ext{total}}$					Г ₂₀₀ /Г
VALUE	<u>CL%</u>	DOCUMENT ID	TECN	COMMENT	
<1.0 \times 10 ⁻⁰ • • • We do not use	90 the followi	⁴²⁷ AUBERT 05 ing data for averages, fits	BABR 5. limits.	$e^+e^- \rightarrow$ etc. • • •	$\Upsilon(4S)$
$<1.0 \times 10^{-6}$	90	428 ΔUBERT 04C	[·] RΔRR		$\Upsilon(4S)$
$< 0.92 \times 10^{-5}$	90	⁴²⁷ COAN 00	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
427 Assumes equal pro	duction o	f B^+ and B^0 at the $\Upsilon(4)$	15)		()
⁴²⁸ Assumes equal pro	duction o	f B^+ and B^0 at $\Upsilon(4S)$.			
$\Gammaig(\phi\gammaig)/\Gamma_{ ext{total}}$					Г ₂₀₁ /Г
VALUE	<u>CL%</u>	DOCUMENT ID	TECN	<u>COMMENT</u>	
<0.33 × 10 ⁻⁵	90	⁴²⁹ COAN 00	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
⁴²⁹ Assumes equal pro	duction o	f B^+ and B^0 at the $\Upsilon(4)$	4 <i>5</i>).		
$\Gamma(\pi^+\pi^-)/\Gamma_{ ext{total}}$					Г ₂₀₂ /Г
<u>VALUE (units 10⁻⁶)</u> 4.6±0.4 OUR A	<u>CL% EV</u> /ERAGE	TS DOCUMENT ID	TE	CN COMME	NT
$4.4 \pm 0.6 \pm 0.3$		⁴³⁰ CHAO	04 BE	LL e ⁺ e ⁻	$\rightarrow ~\Upsilon(4S)$
4.5 + 1.4 + 0.5		⁴³⁰ BORNHEIM	03 CL	E2 e ⁺ e ⁻	$\rightarrow \Upsilon(4S)$
-1.2-0.4 47+06+02		430 AUBERT	020 BA	BR e ⁺ e ⁻	$\rightarrow \Upsilon(4S)$
• • • We do not use	the followi	ing data for averages, fits	s, limits,	etc. • • •	
$5.4 \pm 1.2 \pm 0.5$		⁴³⁰ CASEY	02 BE	LL Repl. b	y CHAO 04
5.6 + 2.3 + 0.4		⁴³⁰ ABE	01H BE	LL Repl. b	v CASEY 02
-2.0-0.5 4 1+1 0+0 7		430 AUBERT	01F BA	BR Rent h	
		/21	012 0,		SERT_02Q
< 67	90	431 ABE	00C SL	D e⊤e ⁻	\rightarrow Z
$4.3^{+1.0}_{-1.4}\pm0.5$		⁴³⁰ CRONIN-HEN	.00 CL	E2 Repl. b	by BORN- M 03
< 15	90	GODANG	98 CL	E2 Repl. b	y CRONIN-
< 45	90	⁴³² ADAM	96d DL	PH e^+e^-	$\rightarrow Z$
< 20	90	ASNER	96 CL	E2 Repl. b DAN	y GO- NG 98
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< 41	90		433 BUSKULIC	96∨ ALEP	$e^+e^- \rightarrow Z$
< 55	90		⁴³⁴ ABREU	95N DLPH	Sup. by ADAM 96D
< 47	90		⁴³⁵ AKERS	94L OPAL	$e^+e^- \rightarrow Z$
< 29	90		⁴³⁶ BATTLE	93 CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
<130	90		⁴³⁶ ALBRECHT	90в ARG	$e^+e^- ightarrow ~\Upsilon(4S)$
< 77	90		⁴³⁷ BORTOLETT	O89 CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
<260	90		⁴³⁷ BEBEK	87 CLEO	$e^+e^- ightarrow ~\Upsilon(4S)$
<500	90	4	GILES	84 CLEO	$e^+e^- ightarrow ~\Upsilon(4S)$

 430 Assumes equal production of B^+ and B^0 at the $\Upsilon(4S).$

431 ABE 00C assumes B(Z $\rightarrow b\overline{b}$)=(21.7 \pm 0.1)% and the B fractions $f_{B^0}=f_{B^+}=$ $(39.7^{+1.8}_{-2.2})\% \text{ and } f_{B_s} = (10.5^{+1.8}_{-2.2})\%.$ $^{432}\text{ADAM 96D assumes } f_{B^0} = f_{B^-} = 0.39 \text{ and } f_{B_s} = 0.12.$

⁴³³ BUSKULIC 96V assumes PDG 96 production fractions for B^0 , B^+ , B_s , b baryons.

⁴³⁴ Assumes a B^0 , B^- production fraction of 0.39 and a B_s production fraction of 0.12. ⁴³⁵ Assumes B($Z \rightarrow b\overline{b}$) = 0.217 and B^0_d (B^0_s) fraction 39.5% (12%). ⁴³⁶ Assumes equal production of $B^0\overline{B}^0$ and B^+B^- at $\Upsilon(4S)$.

⁴³⁷ Paper assumes the $\Upsilon(4S)$ decays 43% to $B^0 \overline{B}^0$. We rescale to 50%.

$\Gamma(\pi^+\pi^-)/\Gamma(K^+\pi^-)$				$\Gamma_{202}/\Gamma_{143}$
VALUE	DOCUMENT ID	TECN	<u>COMMENT</u>	
$0.29^{+0.13}_{-0.12}^{+0.01}_{-0.02}$	ABE	01H BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$

 $\Gamma(\pi^0\pi^0)/\Gamma_{\rm total}$

Г ₂₀₃ /	
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VALUE (units 10^{-6})	CL%	DOCUMENT ID	TECN	COMMENT
1.9 ± 0.5 OUR AVER	AGE			
$2.1\!\pm\!0.6\!\pm\!0.3$		⁴³⁸ AUBERT	03s BABR	$e^+e^- ightarrow ~\Upsilon(4S)$
$1.7\!\pm\!0.6\!\pm\!0.2$		⁴³⁸ LEE	03 BELL	$e^+e^- ightarrow ~\Upsilon(4S)$
$\bullet \bullet \bullet$ We do not use the	e follow	ing data for averages	s, fits, limits,	etc. ● ● ●
< 3.6	90	⁴³⁸ AUBERT	03L BABR	$e^+e^- ightarrow ~\Upsilon(4S)$
< 4.4	90	⁴³⁸ BORNHEIM	03 CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
< 5.7	90	⁴³⁸ ASNER	02 CLE2	$e^+e^- ightarrow ~\Upsilon(4S)$
< 6.4	90	⁴³⁸ CASEY	02 BELL	$e^+e^- ightarrow ~\Upsilon(4S)$
< 9.3	90	GODANG	98 CLE2	Repl. by ASNER 02
< 9.1	90	ASNER	96 CLE2	Repl. by GODANG 98
<60	90	⁴³⁹ ACCIARRI	95H L3	$e^+e^- \rightarrow Z$
420				

 438 Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. $^{439}\,{\rm ACCIARRI}$ 95H assumes f_{B^0} = 39.5 \pm 4.0 and f_{B_s} = 12.0 \pm 3.0%.

$\Gamma(\eta \pi^0)/\Gamma_{\rm total}$

 Γ_{204}/Γ

VALUE	<u>CL%</u>	DOCUMENT ID	TECI	<u>COMMENT</u>	
<2.5 × 10 ⁻⁶	90	⁴⁴⁰ AUBERT,B	04D BAE	$\mathrm{BR} \ e^+ e^- \rightarrow \ \Upsilon(4S)$	
\bullet \bullet \bullet We do not use the	e follow	ing data for averages	s, fits, limi [,]	ts, etc. ● ● ●	
${<}2.9 imes10^{-6}$	90	440 RICHICHI	00 CLE	2 $e^+e^- \rightarrow \Upsilon(4S)$	
$< 8 \times 10^{-6}$	90	BEHRENS	98 CLE	2 Repl. by RICHICHI 00	
$< 2.5 \times 10^{-4}$	90	⁴⁴¹ ACCIARRI	95н L3	$e^+e^- \rightarrow Z$	
$< 1.8 \times 10^{-3}$	90	⁴⁴² ALBRECHT	908 ARG	$e^+ e^- ightarrow ~\Upsilon(4S)$	

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⁴⁴⁰ Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. ⁴⁴¹ ACCIARRI 95H assumes $f_{R^0}=$ 39.5 \pm 4.0 and $f_{B_c}=$ 12.0 \pm 3.0%. ⁴⁴²ALBRECHT 90B limit assumes equal production of $B^0 \overline{B}{}^0$ and $B^+ B^-$ at $\Upsilon(4S)$. $\Gamma(\eta\eta)/\Gamma_{\text{total}}$ Γ_{205}/Γ DOCUMENT ID TECN COMMENT VALUE CL% 443 AUBERT.B 04X BABR $e^+e^- \rightarrow \Upsilon(4S)$ $<2.8 \times 10^{-0}$ 90 • • • We do not use the following data for averages, fits, limits, etc. • $e^+e^- \rightarrow \Upsilon(4S)$ $e^+e^- \rightarrow Z$ $< 1.8 \times 10^{-5}$ BEHRENS 98 CLE2 90 ⁴⁴⁴ ACCIARRI $< 4.1 \times 10^{-4}$ 95H L3 90 ⁴⁴³ Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. $^{444}\,{\rm ACCIARRI}$ 95H assumes f_{B^0} = 39.5 \pm 4.0 and f_{B_s} = 12.0 \pm 3.0%. $\Gamma(\eta' \pi^0) / \Gamma_{\text{total}}$ Γ_{206}/Γ DOCUMENT ID VALUE CL% TECN COMMENT 445 AUBERT,B 90 04D BABR $e^+e^- \rightarrow \Upsilon(4S)$ <3.7 × 10[⁼] • • • We do not use the following data for averages, fits, limits, etc. • $< 5.7 \times 10^{-6}$ ⁴⁴⁵ RICHICHI $e^+e^- \rightarrow \Upsilon(4S)$ 90 00 CLE2 $< 1.1 \times 10^{-5}$ 90 **BEHRENS** 98 CLE2 Repl. by RICHICHI 00 ⁴⁴⁵ Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. $\Gamma(\eta'\eta')/\Gamma_{\text{total}}$ Γ_{207}/Γ DOCUMENT ID TECN COMMENT VALUE CL% <10 × 10⁻⁶ 446 AUBERT.B 90 04x BABR $e^+e^- \rightarrow \Upsilon(4S)$ • • • We do not use the following data for averages, fits, limits, etc. $< 4.7 \times 10^{-5}$ 98 CLE2 $e^+e^- \rightarrow \Upsilon(4S)$ 90 BEHRENS ⁴⁴⁶ Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. $\Gamma(\eta'\eta)/\Gamma_{\text{total}}$ Γ_{208}/Γ DOCUMENT ID TECN COMMENT VALUE CL% $<4.6 \times 10^{-6}$ 447 AUBERT.B 04x BABR $e^+e^- \rightarrow \Upsilon(4S)$ 90 • • • We do not use the following data for averages, fits, limits, etc. • • • $< 2.7 \times 10^{-5}$ 90 BEHRENS 98 CLE2 $e^+e^- \rightarrow \Upsilon(4S)$ ⁴⁴⁷ Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. $\Gamma(\eta' \rho^0) / \Gamma_{\text{total}}$ Γ₂₀₉/Γ VALUE DOCUMENT ID TECN COMMENT CL% <4.3 × 10⁻⁶ 448 AUBERT.B 04D BABR $e^+e^- \rightarrow \Upsilon(4S)$ 90 • • • We do not use the following data for averages, fits, limits, etc. • $< 1.2 \times 10^{-5}$ 448 RICHICHI 00 CLE2 $e^+e^- \rightarrow \Upsilon(4S)$ 90 $< 2.3 \times 10^{-5}$ BEHRENS 98 CLE2 Repl. by RICHICHI 00 90 ⁴⁴⁸ Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

$\Gamma(\eta \rho^0) / \Gamma_{\text{total}}$							Г ₂₁₀ /Г
VALUE	<u>CL%</u>		DOCUMENT ID		TECN	<u>COMMENT</u>	
<1.5 × 10 ⁻⁶	90	449	AUBERT,B	04 D	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
• • We do not use the	followi	ng d	ata for averages	, fits	, limits,	etc. • • •	
$<1.0 \times 10^{-5}$	90	449	RICHICHI	00	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$<1.3 \times 10^{-5}$	90		BEHRENS	98	CLE2	Repl. by R	ICHICHI 00
⁴⁴⁹ Assumes equal produ	ction of	⁻ B ⁺	and B^0 at the	Υ(4	<i>S</i>).		
$\Gamma(\omega\eta)/\Gamma_{ ext{total}}$							Г ₂₁₁ /Г
VALUE (units 10^{-6})	CL%		DOCUMENT ID		TECN	COMMENT	
$4.0^{+1.3}_{-1.2}{\pm}0.4$		450	AUBERT,B	04X	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
• • • We do not use the	followi	ng d	ata for averages	, fits	, limits,	etc. • • •	
<12	90	450	BERGFELD	98	CLE2		
⁴⁵⁰ Assumes equal produ	ction of	B+	and B^0 at the	$\Upsilon(4$	S).		
$\Gamma(\omega \eta')/\Gamma_{total}$							Г212/Г
VALUE	<u>CL%</u>		DOCUMENT ID		TECN	COMMENT	
<2.8 × 10 ⁻⁶	90	451	AUBERT,B	04X	BABR	$e^+ e^- \rightarrow$	$\Upsilon(4S)$
• • • We do not use the	followi	ng d	ata for averages	, fits	, limits,	etc. • • •	
$< 6.0 imes 10^{-5}$	90	451	BERGFELD	98	CLE2		
⁴⁵¹ Assumes equal produ	ction of	⁻ B ⁺	and B^0 at the	γ(4	<i>S</i>).		
$\Gamma(\omega \rho^0) / \Gamma_{\text{total}}$							Г213/Г
VALUE	<u>CL%</u>		DOCUMENT ID		TECN		/
<1.1 × 10 ⁻⁵	90	452	BERGFELD	98	CLE2		
⁴⁵² Assumes equal produ	ction of	B+	and B^0 at the	γ(4	<i>S</i>).		
$\Gamma(\omega\omega)/\Gamma_{total}$							Г ₂₁₄ /Г
VALUE	<u>CL%</u>		DOCUMENT ID		TECN		,
<1.9 × 10 ⁻⁵	90	453	BERGFELD	98	CLE2		
⁴⁵³ Assumes equal produ	ction of	⁻ B ⁺	and B^0 at the	$\Upsilon(4$	<i>S</i>).		
$\Gamma(\phi \pi^{0}) / \Gamma_{total}$							Г ₂₁₅ /Г
VALUE	<u>CL%</u>		DOCUMENT ID		TECN	<u>COMMENT</u>	
<1.0 × 10 ⁻⁶	90	454	AUBERT,B	04 D	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
• • • We do not use the	followi	ng d	ata for averages	, fits	, limits,	etc. • • •	
$< 0.5 imes 10^{-5}$	90	454	BERGFELD	98	CLE2		
⁴⁵⁴ Assumes equal produ	ction of	B+	and B^0 at the	$\Upsilon(4$	<i>S</i>).		
$\Gamma(\phi\eta)/\Gamma_{total}$							Г ₂₁₆ /Г
VALUE	<u>CL%</u>		DOCUMENT ID		TECN	COMMENT	
<1.0 × 10 ⁻⁶	90	455	AUBERT,B	04X	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
• • • We do not use the	followi	ng d	ata for averages	, fits	, limits,	etc. • • •	
$< 0.9 imes 10^{-5}$	90	455	BERGFELD	98	CLE2		
⁴⁵⁵ Assumes equal produ	ction of	[•] B ⁺	and B^0 at the	γ(4	S).		
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			1 460 00				

$\Gammaig(\phi\eta'ig)/\Gamma_{ ext{total}}$							Г ₂₁₇ /Г
VALUE	<u>CL%</u>	<u>DOCU</u>	MENT ID		TECN	COMMENT	
$<4.5 \times 10^{-0}$	90	450 AUB	ERT,B	04X	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
• • • We do not use the	e follow	ing data fo	r averages	s, fits	limits,	etc. • • •	
$<3.1 \times 10^{-5}$	90	450 BER	GFELD	98	CLE2		
⁴⁵⁶ Assumes equal produ	uction o	f B^+ and	B ⁰ at the	Υ(4	S).		
$\Gamma(\phi ho^0) / \Gamma_{ m total}$							Г ₂₁₈ /Г
VALUE	<u>CL%</u>	DOCU	IMENT ID		TECN	<u>COMMENT</u>	
$< 1.3 \times 10^{-5}$	90	457 BER	GFELD	98	CLE2		
• • • We do not use the	e follow	ing data fo	r averages	s, fits	limits,	etc. • • •	
$< 1.56 \times 10^{-4}$	90	⁴⁵⁸ ABE		00C	SLD	$e^+e^- \rightarrow$	Ζ
457 Assumes equal produ	uction o	f B^+ and	B ⁰ at the	γ(4	S).		
⁴⁵⁸ ABE 00C assumes	$B(Z \rightarrow$	$b\overline{b} = (2$	1.7 ± 0.1	L)%	and the	e B fractior	is $f_{B0} = f_{B^+} =$
$(39.7^{+1.8}_{-2.2})\%$ and f_E	_s =(10.	$5^{+1.8}_{-2.2})\%$.					
$\Gamma(\phi\omega)/\Gamma_{\rm total}$							Г ₂₁₉ /Г
VALUE	CL%	DOCU	MENT ID		TECN		
<2.1 × 10 ⁻⁵	90	⁴⁵⁹ BER	GFELD	98	CLE2		
⁴⁵⁹ Assumes equal produ	uction o	f B^+ and	B ⁰ at the	γ(4	<i>S</i>).		
$\Gamma(\phi\phi)/\Gamma_{\text{total}}$							Г ₂₂₀ /Г
VALUE	CL%	DOCU	MENT ID		TECN	<u>COMMENT</u>	,
<1.5 × 10 ⁻⁶	90	⁴⁶⁰ AUB	ERT,B	04X	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\bullet \bullet \bullet$ We do not use the	e follow	ing data fo	r averages	s, fits,	limits,	etc. • • •	、 ,
$< 3.21 \times 10^{-4}$	90	⁴⁶¹ ABE		00 C	SLD	$e^+e^- \rightarrow$	Ζ
$< 1.2 \times 10^{-5}$	90	462 BER	GFELD	98	CLE2		
<3.9 $ imes 10^{-5}$	90	ASNI	ER	96	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
460 Assumes equal produ	uction o	f B^+ and	B ⁰ at the	γ(4	<i>S</i>).		
⁴⁰¹ ABE 00C assumes	$B(Z \rightarrow$	bb)=(2	1.7 ± 0.1	L)%	and the	e B fractior	is $f_{B^0} = f_{B^+} =$
$(39.7^{+1.8}_{-2.2})\%$ and f_E	₃ =(10.	$5^{+1.8}_{-2.2})\%$.					
⁴⁶² Assumes equal produ	iction o	f B^+ and	B ⁰ at the	Υ(4	<i>S</i>).		
$\Gamma(a_0^{\mp}\pi^{\pm})/\Gamma_{ m total}$							Г ₂₂₁ /Г
VALUE (units 10^{-6})	CL%	DOCU	MENT ID		TECN	COMMENT	
<5.1	90	463 AUB	ERT,BE	04	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
⁴⁶³ Assumes equal produ	uction o	f charged a	and neutra	al Br	nesons	from $\Upsilon(4S)$	decays.
$\Gamma(\pi^{+}\pi^{-}\pi^{0})/\Gamma_{total}$							Г ₂₂₂ /Г
VALUE	<u>CL%</u>	<u>DOCU</u>	MENT_ID		TECN	<u>COMMENT</u>	;
<7.2 × 10 ⁻⁴	90	464 ALBI	RECHT	90 B	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
⁴⁶⁴ ALBRECHT 90B lim	it assun	nes equal p	oroduction	of B	0 <u>B</u> 0 ar	nd B^+B^- a	it $\Upsilon(4S)$.



 467 Assumes equal production of B^+ and B^0 at the $\Upsilon(4S).$

⁴⁶⁸ ALBRECHT 90B limit assumes equal production of $B^{0}\overline{B}^{0}$ and $B^{+}B^{-}$ at $\Upsilon(4S)$.

⁴⁶⁹ BEBEK 87 reports $< 6.1 \times 10^{-3}$ assuming the $\Upsilon(4S)$ decays 43% to $B^0 \overline{B}^0$. We rescale to 50%.

$\Gamma(\pi^+\pi^-\pi^+\pi^-)/\Gamma_{\rm to}$	tal				Г ₂₂₅ /Г
VALUE	<u>CL%</u>	DOCUMENT ID	TECN	COMMENT	
<2.3 × 10 ⁻⁴	90	⁴⁷⁰ ADAM	96D DLPH	$e^+ e^- \rightarrow \ Z$	
$\bullet \bullet \bullet$ We do not use the	e followi	ng data for averages	s, fits, limits,	etc. • • •	
${<}2.8 imes10^{-4}$	90	⁴⁷¹ ABREU	95N DLPH	Sup. by ADAM	96D
$< 6.7 \times 10^{-4}$	90	⁴⁷² ALBRECHT	90b ARG	$e^+e^- \rightarrow \Upsilon(4)$	(S)
⁴⁷⁰ ADAM 96D assumes	$f_{B^0} =$	$f_{B^-} = 0.39$ and f_{B_s}	= 0.12.		

⁴⁷¹ Assumes a B^0 , B^- production fraction of 0.39 and a B_s production fraction of 0.12. ⁴⁷² ALBRECHT 90B limit assumes equal production of $B^0 \overline{B^0}$ and $B^+ B^-$ at $\Upsilon(4S)$.

$\Gamma(ho^0 ho^0)/\Gamma_{total}$						Г ₂₂₆ /І
VALUE	<u>CL%</u>	DOCUMENT ID		TECN	COMMENT	
<2.1 × 10 ⁻⁶	90	⁴⁷³ AUBERT	03V	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\bullet \bullet \bullet$ We do not use the	ne follow	ing data for averages	, fits,	, limits,	etc. • • •	
$< 1.8 \times 10^{-5}$	90	⁴⁷⁴ GODANG	02	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$< 1.36 \times 10^{-4}$	90	⁴⁷⁵ ABE	00 C	SLD	$e^+e^- \rightarrow$	Ζ
$< 2.8 \times 10^{-4}$	90	⁴⁷⁶ ALBRECHT	90 B	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$< 2.9 \times 10^{-4}$	90	477 BORTOLETTO	089	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$< 4.3 \times 10^{-4}$	90	⁴⁷⁷ BEBEK	87	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$

 473 Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

⁴⁷⁴ Assumes a helicity 00 configuration. For a helicity 11 configuration, the limit decreases

to 1.4×10^{-5} . 475 ABE 00C assumes B(Z $\rightarrow b\overline{b}$)=(21.7 \pm 0.1)% and the B fractions $f_{B^0} = f_{B^+} =$ $(39.7^{+1.8}_{-2.2})\%$ and $f_{B_s} = (10.5^{+1.8}_{-2.2})\%$.

⁴⁷⁶ ALBRECHT 90B limit assumes equal production of $B^0 \overline{B}{}^0$ and $B^+ B^-$ at $\Upsilon(4S)$. ⁴⁷⁷ Paper assumes the $\Upsilon(4S)$ decays 43% to $B^0 \overline{B}{}^0$. We rescale to 50%.

$\Gamma(a_1(1260)^{\mp}\pi^{\pm})/\Gamma$	total				Г ₂₂₇ /Г
VALUE	CL%	DOCUMENT ID	TECN	COMMENT	
<4.9 × 10 ⁻⁴	90	478 BORTOLETTO	89 CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
\bullet \bullet \bullet We do not use the	ne follow	ing data for averages,	fits, limits,	etc. • • •	
$< 6.3 \times 10^{-4}$	90	479 ALBRECHT	90в ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$< 1.0 \times 10^{-3}$	90	⁴⁷⁸ BEBEK	87 CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$

⁴⁷⁸ Paper assumes the $\Upsilon(4S)$ decays 43% to $B^0\overline{B}^0$. We rescale to 50%. ⁴⁷⁹ ALBRECHT 90B limit assumes equal production of $B^0 \overline{B}{}^0$ and $B^+ B^-$ at $\Upsilon(4S)$.

$\Gamma(a_2(1320)^{\mp}\pi^{\pm})/\Gamma$	total				Г ₂₂₈ /Г
VALUE	<u>CL%</u>	DOCUMENT ID	TECN	<u>COMMENT</u>	
<3.0 × 10 ⁻⁴	90	480 BORTOLETTO89	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
\bullet \bullet \bullet We do not use t	he follow	ing data for averages, fits	s, limits,	etc. • • •	
${<}1.4\times10^{-3}$	90	⁴⁸⁰ BEBEK 87	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
⁴⁸⁰ Paper assumes the	$\Upsilon(4S)$ c	lecays 43% to $B^0 \overline{B}^0$. We	e rescale	to 50%.	

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$\Gamma(\pi^+\pi^-\pi^0\pi^0)/\Gamma_{\rm tot}$	otal				Г ₂₂₉ /Г
VALUE	<u>CL%</u>	DOCUMENT ID	TECN	COMMENT	
$<3.1 \times 10^{-3}$	90	⁴⁸¹ ALBRECHT	90b ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
⁴⁸¹ ALBRECHT 90B li	mit assur	mes equal production	of $B^0 \overline{B}{}^0$ ar	nd B^+B^- a	t $\Upsilon(4S)$.
$\Gamma(ho^+ ho^-)/\Gamma_{ ext{total}}$					Г ₂₃₀ /Г
VALUE (units 10^{-6})	CL%	DOCUMENT ID	TECN	COMMENT	
$30\pm4\pm5$	48	^{2,483} AUBERT,B	04r BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
• • • We do not use t	he follow	ing data for averages	s, fits, limits,	etc. • • •	
$25 {+7+5 \atop -6-6}$		⁴⁸³ AUBERT	04g BABR	Repl. by AUBER	T,B 04r
<2200	90	⁴⁸⁴ ALBRECHT	90b ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
482 The quoted result i alone gives (33 \pm 483 Assumes assumes a 484 ALBRECHT 90B li	s obtaine 4 \pm 5) $ imes$ equal pro mit assur	d after combining wit 10^{-6} . duction of B^+ and B	th AUBERT (B^0 at the $\Upsilon($ of $B^0 \overline{B}^0$ ar	04G result by $(4S)$. nd B^+B^- a	AUBERT 04R $ $ t Υ (4 <i>S</i>).
$\Gamma(a_1(1260)^0 \pi^0) / \Gamma_1$	otal				Г ₂₃₁ /Г
VALUE	<u>CL%</u>	DOCUMENT ID	TECN	COMMENT	;
<1.1 × 10 ⁻³	90	⁴⁸⁵ ALBRECHT	90b ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
485 ALBRECHT 90B li	mit assur	mes equal production	of $B^0 \overline{B}{}^0$ ar	nd B^+B^- a	t $\Upsilon(4S)$.
$\Gamma(\omega \pi^0)/\Gamma_{total}$					Г ₂₃₂ /Г
VALUE	<u>CL%</u>	DOCUMENT ID	TECN	COMMENT	
<1.2 × 10 ⁻⁰	90 ha fallaw	400 AUBERT,B	04D BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
• • • vve do not use t		486 was a considered and the second s	S, TITS, IIMITS,	etc. • • • • $+ -$	$\mathcal{T}(AC)$
$<1.9 \times 10^{-6}$	90	486 ALIBEDT	01C BARD	$e^+e^- \rightarrow e^+e^-$	T(4S)
$< 5 \times 10^{-6}$	90	486 JESSOD		$e^+e^- \rightarrow$	$\Upsilon(45)$
$< 3.5 \times 10^{-5}$	90 90	486 BERGEELD	98 CLE2	Repl by IF	-7 (+3) -SSOP 00
$< 4.6 \times 10^{-4}$	90 90	⁴⁸⁷ ALBRECHT	90 CLLZ	$e^+e^- \rightarrow$	$\Upsilon(4S)$
⁴⁸⁶ Assumes equal pro ⁴⁸⁷ ALBRECHT 90B li	duction c mit assur	of B^+ and B^0 at the mes equal production	$\Upsilon(4S).$ of $B^0 \overline{B}{}^0$ ar	nd B^+B^- at	t Υ(4 <i>S</i>).
$\Gamma(\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{0})$	/Γ				Гаар /Г
		DOCUMENT ID	TECN	COMMENT	• 233/ •
<0.0 × 10 ⁻³	<u> </u>	488 ALBRECHT			$\Upsilon(4S)$
488 AL BRECHT 90B I	90 mit assur	mes equal production	of $B^0 \overline{B}^0$ ar	$e^+e^- \rightarrow$	r(45)
$\Gamma(a_1(1260)^+ \rho^-)/\Gamma$	total				Г ₂₃₄ /Г
VALUE	<u>CL%</u>	DOCUMENT ID	TECN	COMMENT	
$<3.4 \times 10^{-3}$	90	⁴⁸⁹ ALBRECHT	90b ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
489 ALBRECHT 90B li	mit assur	mes equal production	of $B^0 \overline{B}^0$ ar	nd B^+B^- a	t $\Upsilon(4S)$.
$\Gamma(a_1(1260)^0 \rho^0) / \Gamma_t$	otal		TECN	COMMENT	Г ₂₃₅ /Г
<pre>value </pre>	<u> </u>	490 ALODECUT			$\Upsilon(AE)$
4 90 ALEDEECUTE 6 5 W	90	ALBRECHI	SOR AKG	$e \cdot e \rightarrow$	1 (43)
·~~ ALBRECHT 90B li	mıt assur	nes equal production	of $B^{\vee}B^{\vee}$ ar	nd B^+B^- and	t I (45).
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$\Gamma(\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-$	⁻)/Γ _{tot}	tal					Г ₂₃₆ /Г
VALUE	<u>CL%</u>		DOCUMENT ID		TECN	COMMENT	
<3.0 × 10 ⁻³	90	491	ALBRECHT	90 B	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
⁴⁹¹ ALBRECHT 90B limit	t assume	es e	qual production	of B	$0\overline{B}^0$ and	d B^+B^- a	t $\Upsilon(4S)$.
$\Gamma(a_1(1260)^+a_1(1260))$) [_])/Γ _t	otal					Г ₂₃₇ /Г
VALUE	CL%		DOCUMENT ID		TECN	COMMENT	
<2.8 × 10 ⁻³	90	492	BORTOLETTO)89	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
\bullet \bullet \bullet We do not use the	followin	ıg d	ata for averages	, fits	, limits,	etc. • • •	
$< 6.0 \times 10^{-3}$	90	493	ALBRECHT	90 B	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
492 BORTOLETTO 89 re	eports <	3.	$2 imes 10^{-3}$ assum	ning	the $\Upsilon(4$	S) decays 4	3% to $B^0 \overline{B}^0$.
⁴⁹³ ALBRECHT 90B limit	t assume	es e	qual production	of B	$0\overline{B}^0$ and	d B^+B^- a	t $\Upsilon(4S)$.
$\Gamma(\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{-}\pi^{-}\pi^{-}\pi^{-}\pi^{-}\pi^{-$	⁻ π ⁰)/Ι	-	al				Г238/Г
VALUE	CL%	101	DOCUMENT ID		TECN	COMMENT	2307
<1.1 × 10 ⁻²	90	494	ALBRECHT	90B	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
⁴⁹⁴ ALBRECHT 90B limit	t assume	es e	qual production	of B	$\frac{0}{B}$ and $\frac{1}{B}$	d B^+B^- a	t $\Upsilon(4S)$.
$\Gamma(p\overline{p})/\Gamma_{total}$							Гээо/Г
VALUE	CL%		DOCUMENT ID		TECN	COMMENT	- 239/ -
<2.7 × 10 ⁻⁷	90	495	AUBERT	040	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
• • • We do not use the	followin	ıg d	ata for averages	, fits	, limits,	etc. • • •	(10)
$< 1.4 \times 10^{-6}$	90	495	BORNHEIM	03	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$< 1.2 \times 10^{-6}$	90	495	ABE	020	BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$< 7.0 \times 10^{-6}$	90	495	COAN	99	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$< 1.8 \times 10^{-5}$	90	496	BUSKULIC	96v	ALEP	$e^+e^- \rightarrow$	Z
$< 3.5 \times 10^{-4}$	90	497	ABREU	95N	DLPH	Sup. by Al	DAM 96d
$< 3.4 \times 10^{-5}$	90	498	BORTOLETTO)89	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$< 1.2 \times 10^{-4}$	90	499	ALBRECHT	88F	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$< 1.7 \times 10^{-4}$	90	498	BEBEK	87	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
⁴⁹⁵ Assumes equal produc	ction of	B^+	and B^0 at the	$\Upsilon(4$	S).		
⁴⁹⁶ BUSKULIC 96∨ assur	nes PD0	G 96	production frac	tion	s for B^0	, B ⁺ , B _s , I	b baryons.
497 Assumes a B^0 , B^- p	roductio	on f	raction of 0.39 a	nd a	B _s pro	duction frac	tion of 0.12.
498 Paper assumes the γ	(4 <i>S</i>) de	cays	s 43% to B ⁰ B ⁰ .	. We	rescale	to 50%.	
499 ALBRECHT 88F repo	rts < 1.	3 ×	10 ⁻⁴ assuming	the	$\Upsilon(4S)$ of	decays 45%	to <i>B⁰ B⁰.</i> We
rescale to 50%.							
$\Gamma(ho \overline{ ho} \pi^+ \pi^-) / \Gamma_{ m total}$							Г ₂₄₀ /Г
VALUE (units 10^{-4})	CL%		DOCUMENT ID		TECN	COMMENT	
<2.5	90	500	BEBEK	89	CLEO	$e^+ e^- \rightarrow$	$\Upsilon(4S)$
\bullet \bullet \bullet We do not use the	followin	ıg d	ata for averages	, fits	, limits,	etc. • • •	
<9.5	90	501	ABREU	95N	DLPH	Sup. by Al	DAM 96d
$5.4 \pm 1.8 \pm 2.0$		502	ALBRECHT	88F	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
500 BEBEK 89 reports <	2.9×10	-4	assuming the γ	(45)	decavs	43% to B ⁰ E	$\overline{3}^0$. We rescale
to 50%. 501 Assumes a B^0 , B^- p	roductio	on fi	raction of 0.39 a	ind a	B _c pro	duction frac	tion of 0.12.
⁵⁰² ALBRECHT 88F repo	orts 6.0	± 2	2.0 ± 2.2 assum	ing t	the $\Upsilon(4)$	S) decavs 4	5% to $B^0 \overline{B}^0$.
We rescale to 50%.		_		5	()	, , , ,	

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						Г ₂₄₁ /Г
CL%		DOCUMENT ID		TECN	COMMENT	
503	3,504	WANG	04	BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
ne follow	ing d	ata for average	s, fits	, limits,	etc. • • •	
90 503	3,505	ABE	02ĸ	BELL	Repl. by V	/ANG 04
luction o	f <i>B</i> +	and B^0 at the	r(4	<i>S</i>).		
ion for <i>I</i>	M _p p	< 2.85 is also	repor	ted.		
onant pr	oduc	tion of p p from	n Cha	rmoniur	n states.	
otal						Г ₂₄₂ /Г
CL%		DOCUMENT ID		TECN	COMMENT	
90	506	WANG	04	BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
luction o	f <i>B</i> +	and B^0 at the	r(4	<i>S</i>).		
						Г ₂₄₃ /Г
CL%		DOCUMENT ID		TECN	COMMENT	
	507	WANG	03	BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
ne follow	ing d	ata for average	s, fits	, limits,	etc. • • •	
90	507	COAN	99	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
90	508	ALBRECHT	88F	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
uction o ports < 2	f <i>B</i> + 2.0 ×	and B^0 at the 10^{-4} assuming	$\Upsilon(4)$ g the	S). $\Upsilon(4S)$	decays 45%	to <i>B⁰ B⁰.</i> W
						Г ₂₄₄ /Г
<u>CL%</u>		DOCUMENT ID		TECN	<u>COMMENT</u>	
90	509	WANG	03	BELL	$e^+e^- ightarrow$	$\Upsilon(4S)$
luction o	f B ⁺	0 .				(-)
	. 2	and B° at the	Υ(4	<i>S</i>).		(-)
		and B° at the	° Υ(4	<i>S</i>).		Г ₂₄₅ /Г
<u>CL%_</u>	510	and B ^o at the <u>DOCUMENT ID</u>	· Υ(4	S). <u>TECN</u>	COMMENT	Γ ₂₄₅ /Ι
<u>CL%</u> 90	510	and B ^o at the <u>DOCUMENT ID</u> WANG	ε Υ(4 03	S). <u>TECN</u> BELL	$\frac{COMMENT}{e^+e^-} \rightarrow$	Γ₂₄₅/Γ <i>Υ</i> (4 <i>S</i>)
<u>CL%</u> 90 uction o	510 f <i>B</i> +	and B^0 at the <u>DOCUMENT ID</u> WANG and B^0 at the	r(4) 03 $r(4)$	5). <u>TECN</u> BELL 5).	$rac{COMMENT}{e^+e^-} ightarrow$	Γ₂₄₅/Ι <i>Υ</i> (4 <i>S</i>)
<u>CL%</u> 90 luction o	510 f <i>B</i> ⁺	and B^0 at the <u>DOCUMENT ID</u> WANG and B^0 at the	r $\gamma(4)$ 03 r $\gamma(4)$	S). <u>TECN</u> BELL S).	$\frac{COMMENT}{e^+e^-} \rightarrow$	Γ ₂₄₅ /Ι <i>Υ</i> (4 <i>S</i>) Γ ₂₄₆ /Ι
<u>CL%</u> 90 luction o	510 f <i>B</i> +	and B^0 at the <u>DOCUMENT ID</u> WANG and B^0 at the <u>DOCUMENT ID</u>	r $\gamma(4)$ 03 r $\gamma(4)$	S). <u>TECN</u> BELL S). <u>TECN</u>	$\frac{COMMENT}{e^+e^-} \rightarrow \frac{COMMENT}{e^+e^-}$	Γ ₂₄₅ /Ι <i>Υ</i> (4 <i>S</i>) Γ ₂₄₆ /Ι
<u>CL%</u> 90 luction o <u>CL%</u> 90	510 f <i>B</i> ⁺ 511	and B^0 at the <u>DOCUMENT ID</u> WANG and B^0 at the <u>DOCUMENT ID</u> ABE	$\frac{1}{2} \gamma(4)$ $\frac{1}{2} \gamma(4)$ $\frac{1}{2} \gamma(4)$ $\frac{1}{2} \gamma(4)$ $\frac{1}{2} \gamma(4)$	S). <u>TECN</u> BELL S). <u>TECN</u> BELL	$\frac{COMMENT}{e^+e^-} \rightarrow \frac{COMMENT}{e^+e^-} \rightarrow \frac{COMMENT}{e^+e^-}$	Γ ₂₄₅ /Ι <i>Υ</i> (4 <i>S</i>) Γ ₂₄₆ /Ι <i>Υ</i> (4 <i>S</i>)
<u>CL%</u> 90 luction o <u>CL%</u> 90 ie follow	510 f <i>B</i> + 511 ing d	and B^0 at the <u>DOCUMENT ID</u> WANG and B^0 at the <u>DOCUMENT ID</u> ABE ata for averages	$\frac{\gamma}{4}$ $\frac{03}{\gamma}$ $\frac{\gamma}{4}$ $\frac{020}{5}$ $\frac{\gamma}{1}$	S). <u>TECN</u> BELL S). <u>TECN</u> BELL , limits,	$\frac{COMMENT}{e^+e^-} \rightarrow \frac{COMMENT}{e^+e^-} \rightarrow etc. \bullet \bullet \bullet$	Γ ₂₄₅ /Ι <i>Υ</i> (4 <i>S</i>) Γ ₂₄₆ /Ι <i>Υ</i> (4 <i>S</i>)
<u>CL%</u> 90 Juction o <u>CL%</u> 90 ie follow 90	510 f B ⁺ 511 ing d 511	and B ⁰ at the <u>DOCUMENT ID</u> WANG and B ⁰ at the <u>DOCUMENT ID</u> ABE ata for averages BORNHEIM	r(4) 03 $r(4)$ 020 03 03 03 03 03	S). <u>TECN</u> BELL S). <u>TECN</u> BELL , limits, CLE2	$\frac{COMMENT}{e^+e^-} \rightarrow \frac{COMMENT}{e^+e^-} \rightarrow \frac{e^+e^-}{e^+e^-} \rightarrow \frac{e^+e^-}{e^-} \rightarrow \frac{e^+e^-}{e^-} \rightarrow e^+e^-$	r_{245}/l $r_{(45)}$ r_{246}/l $r_{(45)}$
<u>CL%</u> 90 luction o <u>CL%</u> 90 ne follow 90 90	510 f <i>B</i> + 511 ing d 511 512	and B ⁰ at the <u>DOCUMENT ID</u> WANG and B ⁰ at the <u>DOCUMENT ID</u> ABE ata for averages BORNHEIM COAN	$rac{}{}$ $rac{}$ $rac{}$ $rac{}$ $rac{} rac{} rac{} rac{} rac{} rac{} rac{$	S). <u>TECN</u> BELL S). <u>TECN</u> BELL , limits, CLE2 CLE2	$\frac{COMMENT}{e^+e^-} \rightarrow \frac{COMMENT}{e^+e^-} \rightarrow e^+e^- \rightarrow e^+e$	r_{245}/I $r_{(4S)}$ r_{246}/I $r_{(4S)}$ $r_{(4S)}$
<u>CL%</u> 90 luction o <u>CL%</u> 90 ne follow 90 90 luction o	510 f B ⁺ 511 ing d 511 512 f B ⁺	and B^0 at the <u>DOCUMENT ID</u> WANG and B^0 at the <u>DOCUMENT ID</u> ABE ata for averages BORNHEIM COAN and B^0 at the and B^0 at the	r(4) 03 $r(4)$ 020 03 03 99 $r(4)$ $r(4)$ $r(4)$ $r(4)$ $r(4)$	S). <u>TECN</u> BELL S). <u>TECN</u> BELL , limits, CLE2 CLE2 S). C	$\frac{COMMENT}{e^+e^-} \rightarrow \frac{COMMENT}{e^+e^-} \rightarrow e^+e^- \rightarrow e^+e$	$r_{245}/r_{7(45)}$ $r_{246}/r_{7(45)}$ $r_{7(45)}$
	ie follow $g_0 503$ luction o ion for I onant pr stal <u>CL%</u> 90 luction o <u>CL%</u> ne follow 90 luction o ports < 2 <u>CL%</u> 90	the following diagonal state of the following diagonal stateo	503,504 WANG The following data for averages $90\ 503,505\ \text{ABE}$ For the following of B^+ and B^0 at the following of $p\overline{p}$ from the following data for averages $90\ 506\ \text{WANG}$ For the following data for averages $90\ 507\ \text{WANG}$ For the following data for averages $90\ 507\ \text{COAN}$ $90\ 508\ \text{ALBRECHT}$ For the following data for averages $90\ 507\ \text{COAN}$ $90\ 508\ \text{ALBRECHT}$ For the following data for averages $90\ 507\ \text{COAN}$ $90\ 508\ \text{ALBRECHT}$ For the following data for averages $90\ 507\ \text{COAN}$ $90\ 508\ \text{ALBRECHT}$ For the following data for averages $90\ 507\ \text{COAN}$ $90\ 508\ \text{ALBRECHT}$ For the following data for averages $90\ 507\ \text{COAN}$ $90\ 508\ \text{ALBRECHT}$ For the following data for averages $90\ 507\ \text{COAN}$ $90\ 508\ \text{ALBRECHT}$ For the following data for averages $90\ 509\ \text{WANG}$ For the following data for averages $90\ 500\ \text{WANG}$ For the following data f	$\begin{array}{rcl} & 503,504 \text{ WANG} & 04 \\ \text{ie following data for averages, fits} & 90 & 503,505 & ABE & 02k \\ \text{luction of } B^+ & \text{and } B^0 & \text{at the } \Upsilon(4 \\ \text{ion for } M_{p\overline{p}} < 2.85 & \text{is also report} \\ \text{on ant production of } p\overline{p} & \text{from Cha} \\ \hline \textbf{Mang} & 0 & 0 \\ \hline \textbf{Mang} & $	$\begin{array}{rcl} 503,504 \text{ WANG} & 04 \text{ BELL} \\ \text{ie following data for averages, fits, limits,} \\ 90 503,505 \text{ ABE} & 02 \text{K} \text{ BELL} \\ \text{luction of } B^+ \text{ and } B^0 \text{ at the } \Upsilon(4S). \\ \text{ion for } M_{p\overline{p}} < 2.85 \text{ is also reported.} \\ \text{onant production of } p\overline{p} \text{ from Charmonium} \\ \hline \textbf{xal} \\ \underline{\qquad CL\%} & \underline{DOCUMENT \ ID} & \underline{TECN} \\ 90 & 506 \text{ WANG} & 04 \text{ BELL} \\ \text{luction of } B^+ \text{ and } B^0 \text{ at the } \Upsilon(4S). \\ \underline{\qquad CL\%} & \underline{DOCUMENT \ ID} & \underline{TECN} \\ 507 \text{ WANG} & 03 \text{ BELL} \\ \text{ne following data for averages, fits, limits,} \\ 90 & 507 \text{ COAN} & 99 \text{ CLE2} \\ 90 & 508 \text{ ALBRECHT} & 88\text{F} \text{ ARG} \\ \text{luction of } B^+ \text{ and } B^0 \text{ at the } \Upsilon(4S). \\ \hline \text{ports} < 2.0 \times 10^{-4} \text{ assuming the } \Upsilon(4S) \\ \underline{\qquad CL\%} & \underline{DOCUMENT \ ID} & \underline{TECN} \\ \hline \text{g0} & 509 \text{ WANG} & 03 \text{ BELL} \\ \hline \end{array}$	$503,504 \text{ WANG} \qquad 04 \text{ BELL } e^+e^- \rightarrow$ The following data for averages, fits, limits, etc. • • • 90,503,505 ABE 02K BELL Repl. by Will luction of B^+ and B^0 at the $\Upsilon(4S)$. The following data for averages, fits, limits, etc. • • • 90,506 $\frac{DOCUMENT \ ID}{Pp}$ from Charmonium states. Stal $-\frac{CL\%}{90} \frac{DOCUMENT \ ID}{506} \frac{TECN}{WANG} 04 \text{ BELL } e^+e^- \rightarrow$ Function of B^+ and B^0 at the $\Upsilon(4S)$. $-\frac{CL\%}{507} \frac{DOCUMENT \ ID}{WANG} 03 \text{ BELL } e^+e^- \rightarrow$ The following data for averages, fits, limits, etc. • • • 90, 507 COAN 99, $CLE2 \ e^+e^- \rightarrow$ Function of B^+ and B^0 at the $\Upsilon(4S)$. The following data for averages, fits, limits, etc. • • • 90, 507 COAN 99, $CLE2 \ e^+e^- \rightarrow$ Function of B^+ and B^0 at the $\Upsilon(4S)$. Forts < 2.0 × 10 ⁻⁴ assuming the $\Upsilon(4S)$ decays 45% $-\frac{CL\%}{90} \frac{DOCUMENT \ ID}{509} \frac{DOCUMENT \ ID}{WANG} 03 \ BELL \ e^+e^- \rightarrow$
$\Gamma(\Delta^0 \overline{\Delta^0}) / \Gamma_{total}$						Γ247/Γ
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VALUE	CL%	DOCUMENT ID		TECN	COMMENT	- 2477 -
<0.0015	90	513 BORTOLETT	089	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
⁵¹³ BORTOLETTO 89 to 50%.	reports -	$<$ 0.0018 assuming γ	^(4 <i>S</i>)	decays	43% to B ⁰ E	³⁰ . We rescale
$\Gamma(\Delta^{++}\overline{\Delta}^{})/\Gamma_{tota}$				TECH	601415NT	Г ₂₄₈ /Г
VALUE	<u> </u>	514 DODTOLETT	000		<u>COMMENT</u>	$\gamma(AC)$
⁵¹⁴ BORTOLETTO 89 rescale to 50%.	reports	$< 1.3 \times 10^{-4}$ assume	ning	$\Upsilon(4S)$ d	e r e → lecays 43% [·]	to $B^0 \overline{B}^0$. We
$\Gamma(\overline{D}^0 p \overline{p}) / \Gamma_{\text{total}}$				TECH	601.41 FN T	Г ₂₄₉ /Г
<u>VALUE</u> (1 19 \pm 0 15 \pm 0 16) \times 10	<u>0</u> =4	515 ADE	0.014		<u>COMMENT</u>	$\gamma(AC)$
(1.10±0.15±0.10) × 1	U ·		020	(BELL	$e \cdot e \rightarrow$	1 (45)
Assumes equal proc	luction c	of B^{+} and B° at the	e <i>I</i> (4	-5).		
$\Gamma(\overline{D}^*(2007)^0 p \overline{p}) / \Gamma$	total					Г ₂₅₀ /Г
VALUE		DOCUMENT ID		TECN	<u>COMMENT</u>	
$(1.20^{+0.33}_{-0.29}\pm 0.21) \times 1$	0 ⁻⁴	⁵¹⁶ ABE	02W	/ BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
⁵¹⁶ Assumes equal prod	luction c	f B^+ and B^0 at the	e Υ(4	·S).		
$\Gamma(\overline{\Sigma}_{c}^{}\Delta^{++})/\Gamma_{\text{total}}$	al l					Г ₂₅₁ /Г
VALUE	<u>CL%</u>	DOCUMENT ID		<u>TECN</u>	COMMENT	
<0.0010	90	JT PROCARIO	94	CLE2	$e^+e^- \rightarrow$	T(4S)
best value $B(\Lambda_c^+ \rightarrow$	orts < 0 $\rightarrow pK^{-2}$.0012 for $B(\Lambda_c^+ \to \pi^+) = 0.050.$	pK ⁻	$(\pi^{+}) =$	0.043. We	rescale to our
$\Gamma(\overline{\Lambda}_{c}^{-} \rho \pi^{+} \pi^{-}) / \Gamma_{\rm tot}$	al					Г ₂₅₂ /Г
VALUE (units 10 ⁻³)		DOCUMENT ID		TECN	COMMENT	
1.3 ±0.4 OUR AVER 1.7 ±0.3 ±0.4 1.10±0.20±0.29	AGE	⁵¹⁸ DYTMAN ⁵¹⁹ GABYSHEV	02 02	CLE2 BELL	$e^+e^- \rightarrow e^+e^- \rightarrow$	$\Upsilon(4S)$ $\Upsilon(4S)$
• • • We do not use th	ne follow	ing data for averages	s, fits	, limits,	etc. ● ● ●	
$1.33^{+0.46}_{-0.42}\pm0.37$		⁵²⁰ FU	97	CLE2	Repl. by D	YTMAN 02
518 DYTMAN 02 report	ts (1.67	$^{+0.27}_{-0.25}) imes 10^{-3}$ for B	$S(\Lambda_c^+)$	→ pK	$(-\pi^+) = 0.0$)5. We rescale
to our best value B experiment's error a ⁵¹⁹ GABYSHEV 02 rep	$B(\Lambda_c^+ \rightarrow nd \text{ our s})$	$p K^- \pi^+) = (5.0)$ econd error is the sys $\pm 0.2) \times 10^{-3}$ for E	± 1.3 stema $B(\Lambda_c^+)$	$egin{array}{c} B) imes 10^- \ ext{tic error} \ o \ p K \end{array}$	$^{-2}$. Our firs from using $(-\pi^+) = 0.0$	t error is their our best value. 05. We rescale
to our best value B experiment's error a ⁵²⁰ FU 97 uses PDG 96	$S(\Lambda_c^+ \rightarrow 0)$ and our solutions of values δ	$pK^{-}\pi^{+}) = (5.0)$ econd error is the sys of Λ_c branching frac	± 1.3 tema tion.	3) × 10⁻ tic error	⁻² . Our firs from using	t error is their our best value.

p://pdg.lbl.gov) Citation: S.

$(\Lambda_c^- p) / \Gamma_{\text{total}}$							Г ₂₅₃ /Г
<i>ALUE</i> (units 10 ⁻⁵)	CL%		DOCUMENT ID		TECN	COMMENT	
$2.19^{+0.56}_{-0.49} {\pm} 0.65$	521	1,522	GABYSHEV	03	BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
• • We do not use t	he follow	ing d	ata for average	s, fits	, limits,	etc. • • •	
< 9	90 ⁵²¹	1,523	DYTMAN	02	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
< 3.1	90 ⁵²¹	1,524	GABYSHEV	02	BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
<21	90	525	FU	97	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
²¹ Assumes equal prod	duction o	f <i>B</i> +	and B^0 at the	e Υ(4	<i>S</i>).		
²² The second error f	for GABY	'SHE	V 03 includes	the s	ystemat	ic and the o	error of Λ_c –
$\overline{p}K^+\pi^-$ decay bra	anching fr	ractio	n.	⊢ _	\ _		
²⁰ DY I MAN 02 meas	surement	uses	$B(\Lambda_{c} \rightarrow pK)$	π) = 5.0	\pm 1.3%. If	ne second erro
24 Uses the value for	$\Lambda \rightarrow n$	K^{-}	π^+ branching ra	ne br	5.0 ± 1	(allo. 3)%	
25 FU 97 uses PDG 9	6 values o	of Λ_{-}	branching ratio	0.	5.0 <u>1</u> 1	.0)/0.	
_							
$\left(\overline{\Lambda}_{c}^{-} p \pi^{0}\right) / \Gamma_{\text{total}}$							Γ ₂₅₄ /Ι
ALUE	<u>CL%</u>		DOCUMENT ID		TECN	<u>COMMENT</u>	
<5.9 × 10 ^{—4}	90	526	FU	97	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
²⁶ FU 97 uses PDG 9	6 values o	of Λ_c	branching ratio	0.			
$(\Lambda^{-}n\pi^{+}\pi^{-}\pi^{0})/l$	Γ						
$\frac{1}{(\Lambda_c^- p \pi^+ \pi^- \pi^0)}$	F_{total}		DOCUMENT ID		TECN	COMMENT	Γ ₂₅₅ /Ι
$\frac{(\overline{\Lambda_c} p \pi^+ \pi^- \pi^0)}{ \Lambda_c _{\Delta_c}}$	L <u>CL%</u>	527	<u>DOCUMENT ID</u>	07	<u>TECN</u>	<u>COMMENT</u>	Γ₂₅₅/ Ι
$\frac{(\bar{\Lambda}_{c} p \pi^{+} \pi^{-} \pi^{0})}{\frac{ALUE}{5.07 \times 10^{-3}}}$	F_{total} <u>CL%</u> 90	527	<u>DOCUMENT ID</u> FU	97	<u>tecn</u> CLE2	$\frac{COMMENT}{e^+e^-} \rightarrow$	Γ₂₅₅/Ι <i>Υ</i> (4 <i>S</i>)
- (Λ _c ρπ ⁺ π ⁻ π ⁰)/Ι <u>ΔLUE</u> <5.07 × 10 ⁻³ ²⁷ FU 97 uses PDG 9	F _{total} <u>CL%</u> 90 6 values o	527 of <i>Л_с</i>	DOCUMENT ID FU branching ratio	97 o.	<u>TECN</u> CLE2	$\frac{COMMENT}{e^+e^-} \rightarrow$	Γ₂₅₅/Ι <i>Υ</i> (4 <i>S</i>)
$(\overline{\Lambda_{c}^{-}} p \pi^{+} \pi^{-} \pi^{0}) / [$ (ALUE) $(5.07 \times 10^{-3})^{-3}$ $(\overline{\Lambda_{c}^{-}} p \pi^{+} \pi^{-} \pi^{+} \pi^{-})^{-3}$	Γ _{total} <u>CL%</u> 90 6 values o)/Γ_{tota}	527 of <i>Л_с al</i>	<u>DOCUMENT ID</u> FU branching ratio	97 o.	<u>TECN</u> CLE2	$\frac{COMMENT}{e^+e^-} \rightarrow$	Γ ₂₅₅ /Ι ^{γ(4S)} Γ ₂₅₆ /Ι
$(\Lambda_{c}^{-} \rho \pi^{+} \pi^{-} \pi^{0}) / \mu_{ALUE}$ <5.07 × 10 ⁻³ ²⁷ FU 97 uses PDG 90 $(\Lambda_{c}^{-} \rho \pi^{+} \pi^{-} \pi^{+} \pi^{-})$ (ALUE	Γ _{total} <u>2L%</u> 90 6 values α -)/Γ _{tota} <u>2L%</u>	527 of <i>A_c al</i>	DOCUMENT ID FU branching ratio	97 o.	<u>TECN</u> CLE2 <u>TECN</u>	$\frac{COMMENT}{e^+e^-} \rightarrow \frac{COMMENT}{COMMENT}$	Γ ₂₅₅ /Ι <i>τ</i> (4 <i>S</i>) Γ ₂₅₆ /Ι
$\frac{(\overline{\Lambda_{c}} p \pi^{+} \pi^{-} \pi^{0})}{(\overline{\Lambda_{c}} p \pi^{+} \pi^{-} \pi^{0})}$	Γ _{total} <u>CL%</u> 90 6 values α –)/Γ _{tota} <u>2L%</u> 90	527 of <i>A_c</i> al 528	DOCUMENT ID FU branching ratio DOCUMENT ID FU	97 o. 97	<u>TECN</u> CLE2 <u>TECN</u> CLE2	$\frac{COMMENT}{e^+e^-} \rightarrow \frac{COMMENT}{e^+e^-} \rightarrow \frac{COMMENT}{e^+e^+e^-} \rightarrow \frac{COMMENT}{e^+e^+e^-} \rightarrow \frac{COMMENT}{e^+e^+e^-} \rightarrow \frac{COMENT}{e^+e^+e^-} \rightarrow \frac{COMENT}{e^+e^+e^+e^-} \rightarrow \frac{COMENT}{e^+e^+e^+e^+}$	Γ₂₅₅/Ι <i>Υ</i> (4 <i>S</i>) Γ₂₅₆/Ι <i>Υ</i> (4 <i>S</i>)
$(\overline{\Lambda_{c}^{-} \rho \pi^{+} \pi^{-} \pi^{0}})/l$ (ALUE) $<5.07 \times 10^{-3}$ 27 FU 97 uses PDG 90 $\cdot (\overline{\Lambda_{c}^{-} \rho \pi^{+} \pi^{-} \pi^{-} \pi^{+} \pi^{-} \pi^{+} \pi^{-} \pi^{-}$	Γ _{total} 90 6 values α -)/Γ _{tota} 90 6 values α	527 of Λ_c al 528 of Λ_c	DOCUMENT ID FU branching ratio DOCUMENT ID FU branching ratio	97 o. 97 97 o.	<u>TECN</u> CLE2 <u>TECN</u> CLE2	$\frac{COMMENT}{e^+e^-} \rightarrow \frac{COMMENT}{e^+e^-} \rightarrow \frac{COMMENT}{e^+e^-}$	Γ₂₅₅/Ι <i>Υ</i> (4 <i>S</i>) Γ₂₅₆/Ι <i>Υ</i> (4 <i>S</i>)
$(\Lambda_{c}^{-} p \pi^{+} \pi^{-} \pi^{0})/l$ (ALUE (5.07 × 10 ⁻³) (77 FU 97 uses PDG 90 $(\Lambda_{c}^{-} p \pi^{+} \pi^{-} \pi^{-} \pi^{+} \pi^{-} \pi^{$	Γ <mark>total</mark> <u>CL%</u> 90 6 values α <u>-)/Γtota</u> <u>90</u> 6 values α	527 of Λ_c al 528 of Λ_c	DOCUMENT ID FU branching ratio DOCUMENT ID FU branching ratio	97 o. 97 o.	TECN CLE2 TECN CLE2	$\frac{COMMENT}{e^+e^-} \rightarrow \frac{COMMENT}{e^+e^-} \rightarrow \frac{COMAT}{e^+e^-} \rightarrow \frac{COMAT}{e^+e^-} \rightarrow \frac{COMAT}{e^+e^-} \rightarrow \frac{COMAT}{e^+e^-} \rightarrow \frac{COMENT}{e^+e^-} \rightarrow COM$	Γ₂₅₅/ <i>Υ</i> (4 <i>S</i>) Γ₂₅₆/ <i>Υ</i> (4 <i>S</i>)
$(\overline{\Lambda_{c}^{-}} \rho \pi^{+} \pi^{-} \pi^{0}) / \mu_{ALUE}$ $< 5.07 \times 10^{-3}$ 27 FU 97 uses PDG 90 $(\overline{\Lambda_{c}^{-}} \rho \pi^{+} \pi^{-} \pi^{-} \pi^{+} \pi^{-} \pi^{-} \pi^{+} \pi^{-} $	Γ _{total} 90 6 values o -)/Γ _{tota} 90 6 values o +)/Γ _{tota}	527 of Λ_c al 528 of Λ_c al	DOCUMENT ID FU branching ratio DOCUMENT ID FU branching ratio	97 o. 97 o.	<u>TECN</u> CLE2 <u>TECN</u> CLE2	$\frac{COMMENT}{e^+e^-} \rightarrow \frac{COMMENT}{e^+e^-} \rightarrow \frac{COMENT}{e^+e^-} $	Γ ₂₅₅ /Ι
$\frac{(\Lambda_{c}^{-} \rho \pi^{+} \pi^{-} \pi^{0})}{(\Lambda_{c}^{-} \rho \pi^{+} \pi^{-} \pi^{0})}$ $\frac{2^{7} \text{ FU } 97 \text{ uses PDG } 97}{(\Lambda_{c}^{-} \rho \pi^{+} \pi^{-} \pi^{-} \pi^{+} \pi^{-} \pi^{-} \pi^{+} \pi^{-} \pi^{-} \pi^{+} \pi^{-} \pi^{-$	Γ _{total} <u>2L%</u> 90 6 values o –)/Γ _{tota} <u>90</u> 6 values o +)/Γ _{tota}	527 of Λ_c al 528 of Λ_c al	DOCUMENT ID FU branching ratio DOCUMENT ID FU branching ratio	97 o. 97 o.	TECN CLE2 TECN CLE2	$\frac{COMMENT}{e^+e^-} \rightarrow \frac{COMMENT}{e^+e^-} \rightarrow \frac{COMMENT}{COMMENT}$	Γ ₂₅₅ /Ι <i>Υ</i> (4 <i>S</i>) <i>Γ</i> (4 <i>S</i>) <i>Γ</i> (4 <i>S</i>) Γ ₂₅₇ /Ι
$\frac{(\Lambda_{c}^{-} \rho \pi^{+} \pi^{-} \pi^{0})}{(\Lambda_{c}^{-} \rho \pi^{+} \pi^{-} \pi^{0})}$ $\approx \frac{(\Lambda_{c}^{-} \rho \pi^{+} \pi^{-} \pi^{-} \pi^{+} \pi^{-} \pi^{-} \pi^{+} \pi^{-} \pi^{-} \pi^{+} \pi^{-} \pi$	Γ _{total} 90 6 values o -)/Γ _{tota} 90 6 values o +)/Γ _{tota}	527 of Λ_c al 528 of Λ_c bl 529	DOCUMENT ID FU branching ratio DOCUMENT ID FU branching ratio DOCUMENT ID GABYSHEV	97 o. 97 o.	TECN CLE2 TECN CLE2 TECN BELL	$\frac{COMMENT}{e^+e^-} \rightarrow \frac{COMMENT}{e^+e^-} \rightarrow \frac{COMAE}{e^+e^-} \rightarrow \frac{COMAE}{E$	Γ₂₅₅/ Ι <i>Υ</i> (4 <i>S</i>) Γ₂₅₆/Ι <i>Υ</i>(4<i>S</i>) Γ₂₅₇/Ι <i>Υ</i>(4<i>S</i>)
$(\overline{\Lambda_{c}^{-} p \pi^{+} \pi^{-} \pi^{0}})/l$ <u>ALUE</u> $<5.07 \times 10^{-3}$ 27 FU 97 uses PDG 94 $\cdot (\overline{\Lambda_{c}^{-} p \pi^{+} \pi^{-} \pi^{-} \pi^{+} \pi^{-} \pi$	Γtotal 90 90 6 values of -)/Γtota 90 6 values of +)/Γtota ports (1.)	527 $f A_c$ al 528 $f A_c$ $f A_c$	$\frac{DOCUMENT \ ID}{FU}$ branching ratio $\frac{DOCUMENT \ ID}{FU}$ branching ratio $\frac{DOCUMENT \ ID}{GABYSHEV}$ $\frac{DOCUMENT \ ID}{DCE} \times 10^{-4} + 10^{-4}$	97 o. 97 o. 02 for B	$\frac{TECN}{CLE2}$ $\frac{TECN}{CLE2}$ $\frac{TECN}{BELL}$ $(\Lambda^+ \rightarrow $	$\frac{COMMENT}{e^+e^- \rightarrow}$ $\frac{COMMENT}{e^+e^- \rightarrow}$ $\frac{COMMENT}{e^+e^- \rightarrow}$ $pK^-\pi^+$	Γ_{255}/I $\tau(4S)$ Γ_{256}/I $\tau(4S)$ Γ_{257}/I $\tau(4S)$ $\tau(4S)$ $\tau(4S)$ $\tau(4S)$ $\tau(4S)$
$(\Lambda_c^- \rho \pi^+ \pi^- \pi^0)/l$ <u>ALUE</u> $<5.07 \times 10^{-3}$ 527 FU 97 uses PDG 9 $(\overline{\Lambda}_c^- \rho \pi^+ \pi^- \pi^- \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- \pi^-$	Γtotal 90 6 values of -)/Γtota 90 6 values of +)/Γtota ports (1.4) value B(527 527 A_c 528 528 529 $63 \stackrel{+}{-} ($ $A^+ -$	<u>DOCUMENT ID</u> FU branching ratio <u>DOCUMENT ID</u> FU branching ratio <u>DOCUMENT ID</u> GABYSHEV 0.64) × 10 ⁻⁴ + 3.58) × 10 ⁻⁴ +	97 o. 97 o. 02 for B = (5 ($\frac{TECN}{CLE2}$ $\frac{TECN}{CLE2}$ $\frac{TECN}{BELL}$ $(\Lambda_c^+ \rightarrow 0 + 1, 3)$	$\frac{COMMENT}{e^+e^- \rightarrow}$ $\frac{COMMENT}{e^+e^- \rightarrow}$ $\frac{COMMENT}{e^+e^- \rightarrow}$ $pK^-\pi^+)$ $x \to 10^{-2} O$	Γ_{255}/I $\tau(4S)$ Γ_{256}/I $\tau(4S)$ Γ_{257}/I $\tau(4S)$ $r(4S)$ $r(4S)$ $r(4S)$ $r(4S)$ $r(4S)$ $r(4S)$
$(\Lambda_c^- \rho \pi^+ \pi^- \pi^0)/l$ <u>(ALUE</u> $(\Delta_c^- \rho \pi^+ \pi^- \pi^+ \pi^-)^{(ALUE)}$ $(\Lambda_c^- \rho \pi^+ \pi^- \pi^+ \pi^-)^{(ALUE)}$ $(2.74 \times 10^{-3})^{(28)}$ FU 97 uses PDG 90 $(\Sigma_c (2520)^{} \rho \pi^-)^{(ALUE)}$ $(\Delta_c^- (2520)^{} \rho \pi^-)^{$	$ \frac{CL\%}{90} $ 6 values of $\frac{CL\%}{90} $ 7 value B(a error and	527 of Λ_c al 528 of Λ_c bl 529 63 ⁺⁽⁾ Λ_c^+ Λ_c^+ our s	<u>DOCUMENT ID</u> FU branching ratio <u>DOCUMENT ID</u> FU branching ratio <u>DOCUMENT ID</u> GABYSHEV 0.58 × 10^{-4} + $\rightarrow pK^{-}\pi^{+}$ = second error is t	97 o. 97 o. 02 for B = (5.(he sy	$\frac{TECN}{CLE2}$ $\frac{TECN}{CLE2}$ $\frac{TECN}{BELL}$ $(\Lambda_{c}^{+} \rightarrow 0 \pm 1.3)$ protection	$\frac{COMMENT}{e^+e^- \rightarrow}$	Γ_{255}/I $\tau(4S)$ Γ_{256}/I $\tau(4S)$ Γ_{257}/I $\tau(4S)$ $r(4S)$
$(\Lambda_c^- p \pi^+ \pi^- \pi^0)/l$ (ALUE (5.07 × 10 ⁻³ (27 FU 97 uses PDG 9) $(\Lambda_c^- p \pi^+ \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- \pi^- \pi^-$	CL% 90 6 values of -)/Γtota 90 6 values of +)/Γtota ports (1.0 value B(a error and /Γ	527 of Λ_c 528 of Λ_c 529 63 ⁺⁽⁾ Λ_c^+ - ours	<u>DOCUMENT ID</u> FU branching ratio <u>DOCUMENT ID</u> FU branching ratio <u>DOCUMENT ID</u> GABYSHEV 0.64 × 10^{-4} f $\rightarrow pK^{-}\pi^{+}$ = second error is t	97 o. 97 o. 02 for B = (5.0 he sy	$\frac{TECN}{CLE2}$ $\frac{TECN}{CLE2}$ $\frac{TECN}{BELL}$ $(\Lambda_c^+ \rightarrow 0 \pm 1.3)$ $(\Lambda_c^+ = 0 \pm 1.3)$	$\frac{COMMENT}{e^+e^- \rightarrow}$ $\frac{COMMENT}{e^+e^- \rightarrow}$ $\frac{COMMENT}{e^+e^- \rightarrow}$ $\frac{COMMENT}{e^+e^- \rightarrow}$ $K^-\pi^+)$ $\times 10^{-2}. \text{ Oc error from}$	Γ_{255}/I $\tau(4S)$ Γ_{256}/I $\tau(4S)$ Γ_{257}/I $\tau(4S)$ $r(4S)$ $r(4S)$ $r(4S)$ $r(4S)$ $r(4S)$ $r(4S)$ $r(4S)$ $r(4S)$
$\frac{(\Lambda_{c}^{-} \rho \pi^{+} \pi^{-} \pi^{0})}{(\Lambda_{c}^{-} \rho \pi^{+} \pi^{-} \pi^{0})}$ $\frac{(\Lambda_{c}^{-} \rho \pi^{+} \pi^{-} \pi^{-} \pi^{+} \pi^{-} \pi^{$	$ \begin{bmatrix} CL & 3 \\ Q & 3 \\ $	527 of Λ_c al 528 of Λ_c 529 63 ⁺⁽¹⁾ $(\Lambda_c^+$	<u>DOCUMENT ID</u> FU branching ratio <u>DOCUMENT ID</u> FU branching ratio <u>DOCUMENT ID</u> GABYSHEV 0.64 $\times 10^{-4}$ ft $\Rightarrow pK^{-}\pi^{+}$ = second error is t	97 o. 97 o. 02 for B = (5.0	$\frac{TECN}{CLE2}$ $\frac{TECN}{CLE2}$ $\frac{TECN}{BELL}$ $(\Lambda_{c}^{+} \rightarrow 0 \pm 1.3)$ $TECN$	$\frac{COMMENT}{e^+e^- \rightarrow}$ $\frac{COMMENT}{e^+e^- \rightarrow}$ $\frac{COMMENT}{e^+e^- \rightarrow}$ $pK^-\pi^+)$ $x 10^{-2}. \text{ Oc error from}$	Γ_{255}/I $\tau(4S)$ Γ_{256}/I $\tau(4S)$ Γ_{257}/I $\tau(4S)$ $r(4S)$
$\frac{(\Lambda_{c}^{-} \rho \pi^{+} \pi^{-} \pi^{0})}{(\Lambda_{c}^{-} \rho \pi^{+} \pi^{-} \pi^{0})}$ $\frac{(\Lambda_{c}^{-} \rho \pi^{+} \pi^{-} \pi^{-} \pi^{+} \pi^{-} \pi^{-} \pi^{+} \pi^{-} \pi^{-} \pi^{+} \pi^{-} \pi^{$	$ \frac{CL\%}{90} $ 6 values of $\frac{CL\%}{90} $ 6 values of $\frac{CL\%}{90} $ 6 values of $\frac{CL\%}{90} $ 6 values of $\frac{CL\%}{100} $ ports (1.0 value B(.0 error and $\frac{\Gamma_{total}}{00530} $	527 527 al 528 528 529 $63 \stackrel{+}{-} ($ $\Lambda_c^+ -$ our s	<u>DOCUMENT ID</u> FU branching ratio <u>DOCUMENT ID</u> FU branching ratio <u>DOCUMENT ID</u> GABYSHEV 0.64 × 10^{-4} ft $\rightarrow pK^{-}\pi^{+}$) = second error is t	97 o. 97 o. 02 for B = (5.0 hhe sy	$\frac{TECN}{CLE2}$ $\frac{TECN}{CLE2}$ $\frac{TECN}{DELL}$ $(\Lambda_{c}^{+} \rightarrow 0 \pm 1.3)$ $TECN$ $RELL$	$\frac{COMMENT}{e^+e^-} \rightarrow \frac{COMMENT}{e^+e^-} \rightarrow \frac{COMMENT}{e^+e^-} \rightarrow \frac{COMMENT}{e^+e^-} \rightarrow \frac{DK^-\pi^+}{CCMMENT}$	Γ_{255}/I $\tau(4S)$ Γ_{256}/I $\tau(4S)$ Γ_{257}/I $\tau(4S)$ $r(4S)$ $r(4S)$ $r(4S)$ $r(4S)$ $r(4S)$ $r(4S)$ $r(4S)$ $r(4S)$

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$\Gamma(\overline{\Sigma}_{c}(2455)^{0}p\pi^{-})/\Gamma_{total}$								
VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT			
1.0 ± 0.8 OUR AVERAG	E Erro	or includes scale fact	or of	1.7.				
$2.2 {\pm} 0.7 {\pm} 0.6$		⁵³² DYTMAN	02	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$		
$0.5^{+0.5}_{-0.4}{\pm}0.1$	90	⁵³³ GABYSHEV	02	BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$		
532 DYTMAN 02 report	:s (2.2 ±	\pm 0.7) $ imes$ 10 $^{-4}$ for B	$\delta(\Lambda_c^+)$	$\rightarrow pK$	$(-\pi^+) = 0.0$)5. We rescale		

to our best value $B(\Lambda_c^+ \rightarrow pK^-\pi^+) = (5.0 \pm 1.3) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. $533 \text{ GABYSHEV} \ 02 \text{ reports} \ (0.48^{+0.46}_{-0.41}) \times 10^{-4} \text{ for } B(\Lambda_c^+ \rightarrow pK^-\pi^+) = 0.05$. We rescale to our best value $B(\Lambda_c^+ \rightarrow pK^-\pi^+) = (5.0 \pm 1.3) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

Г₂₆₀/Г

VALUE (units 10 ⁻⁴)	DOCUMENT ID TEC		TECN	COMMENT	
2.8±0.9 OUR AVERAGE					
$3.7 \pm 1.1 \pm 1.0$	⁵³⁴ DYTMAN	02	CLE2	$e^+e^- ightarrow ~\Upsilon(4S)$	
$2.4 \pm 0.7 \pm 0.6$	⁵³⁵ GABYSHEV	02	BELL	$e^+ e^- ightarrow ~ \Upsilon(4S)$	

⁵³⁴ DYTMAN 02 reports $(3.7 \pm 1.1) \times 10^{-4}$ for $B(\Lambda_c^+ \rightarrow pK^-\pi^+) = 0.05$. We rescale to our best value $B(\Lambda_c^+ \rightarrow pK^-\pi^+) = (5.0 \pm 1.3) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. ⁵³⁵ GABYSHEV 02 reports $(2.38^{+0.75}_{-0.69}) \times 10^{-4}$ for $B(\Lambda_c^+ \rightarrow pK^-\pi^+) = 0.05$. We rescale to our best value $B(\Lambda_c^+ \rightarrow pK^-\pi^+) = (5.0 \pm 1.3) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$$\Gamma(\overline{\Lambda}_{c}(2593)^{-} / \overline{\Lambda}_{c}(2625)^{-} p) / \Gamma_{total}$$

Г₂₆₁/Г

VALUE	CL%	DOCUMENT ID		TECN	<u>COMMENT</u>
<1.1 × 10 ⁻⁴	90 536,537	DYTMAN	02	CLE2	$e^+e^- ightarrow ~\Upsilon(4S)$

 $^{536}\operatorname{Assumes}$ equal production of B^+ and B^0 at the $\varUpsilon(4S).$

⁵³⁷ DYTMAN 02 measurement uses $B(\Lambda_c^- \rightarrow \overline{p}K^+\pi^-) = 5.0 \pm 1.3\%$. The second error includes the systematic and the uncertainty of the branching ratio.

$\Gamma(\gamma\gamma)/\Gamma_{\rm total}$

 Γ_{262}/Γ Test for $\Delta B = 1$ weak neutral current. Allowed by higher-order electroweak interactions.

cions.						
VALUE	CL%	DOCUMENT ID		TECN	COMMENT	
<1.7 × 10 ⁻⁶	90	⁵³⁸ AUBERT	011	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\bullet~\bullet~$ We do not use the	followi	ng data for averages	, fits	, limits, (etc. • • •	
${<}3.9 imes10^{-5}$	90	⁵³⁹ ACCIARRI	95ı	L3	$e^+e^- \rightarrow$	Ζ
⁵³⁸ Assumes equal produc	ction of	B^+ and B^0 at the	$\Upsilon(4$	<i>S</i>).		
520			(- /		

⁵³⁹ ACCIARRI 951 assumes $f_{B^0} = 39.5 \pm 4.0$ and $f_{B_s} = 12.0 \pm 3.0\%$.

$\Gamma(e^+e^-)/\Gamma_{\text{total}} \qquad \Gamma_{263}/\Gamma$ Test for $\Delta B = 1$ weak neutral current. Allowed by higher-order electroweak interac-

LIONS.					
VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<1.9 × 10 ⁻⁷	90	⁵⁴⁰ CHANG	03	BELL	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the	followi	ng data for averages	s, fits	, limits,	etc. • • •
$< 8.3 \times 10^{-7}$	90	⁵⁴⁰ BERGFELD	00 B	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
$< 1.4 \times 10^{-5}$	90	⁵⁴¹ ACCIARRI	97 B	L3	$e^+e^- \rightarrow Z$
$< 5.9 \times 10^{-6}$	90	AMMAR	94	CLE2	Repl. by
$< 2.6 \times 10^{-5}$	90	542 AVERY	89 B	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
$< 7.6 \times 10^{-5}$	90	⁵⁴³ ALBRECHT	87 D	ARG	$e^+ e^- ightarrow ~ \Upsilon(4S)$
$< 6.4 \times 10^{-5}$	90	⁵⁴⁴ AVERY	87	CLEO	$e^+e^- ightarrow ~\Upsilon(4S)$
$< 3 \times 10^{-4}$	90	GILES	84	CLEO	Repl. by AVERY 87

 $^{540}\,\text{Assumes}$ equal production of B^+ and B^0 at the $\varUpsilon(4S).$

⁵⁴¹ ACCIARRI 97B assume PDG 96 production fractions for B^+ , B^0 , B_s , and Λ_b .

⁵⁴² AVERY 89B reports $< 3 \times 10^{-5}$ assuming the $\Upsilon(4S)$ decays 43% to $B^0 \overline{B}^0$. We rescale to 50%.

⁵⁴³ ALBRECHT 87D reports $< 8.5 \times 10^{-5}$ assuming the $\Upsilon(4S)$ decays 45% to $B^0 \overline{B}^0$. We rescale to 50%. ⁵⁴⁴ AVERY 87 reports $< 8 \times 10^{-5}$ assuming the $\Upsilon(4S)$ decays 40% to $B^0 \overline{B}^0$. We rescale

⁵⁴⁴ AVERY 87 reports $< 8 \times 10^{-5}$ assuming the $\Upsilon(4S)$ decays 40% to $B^0 \overline{B}^0$. We rescale to 50%.

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

Γ₂₆₄/Γ

Test for $\Delta B = 1$ weak neutral current. Allowed by higher-order electroweak interactions.

VALUE	<u>CL%</u>	DOCUMENT ID		TECN	COMMENT
<1.5 × 10 ⁻⁷	90	⁵⁴⁵ ACOSTA	04D	CDF	<i>р р</i> at 1.96 ТеV
\bullet \bullet \bullet We do not use the	followi	ng data for averages	, fits,	limits,	etc. • • •
$< 1.6 imes 10^{-7}$	90	⁵⁴⁶ CHANG	03	BELL	$e^+e^- ightarrow ~\Upsilon(4S)$
$< 6.1 \times 10^{-7}$	90	⁵⁴⁶ BERGFELD	00 B	CLE2	$e^+e^- ightarrow ~\Upsilon(4S)$
$< 4.0 \times 10^{-5}$	90	ABBOTT	98 B	D0	<i>р</i> р 1.8 ТеV
$< 6.8 \times 10^{-7}$	90	⁵⁴⁷ ABE	98	CDF	<i>р</i> рат 1.8 ТеV
$< 1.0 \times 10^{-5}$	90	⁵⁴⁸ ACCIARRI	97 B	L3	$e^+e^- \rightarrow Z$
$< 1.6 imes 10^{-6}$	90	⁵⁴⁹ ABE	96L	CDF	Repl. by ABE 98
$< 5.9 imes 10^{-6}$	90	AMMAR	94	CLE2	$e^+e^- ightarrow ~\Upsilon(4S)$
$< 8.3 \times 10^{-6}$	90	⁵⁵⁰ ALBAJAR	91 C	UA1	$E_{\rm cm}^{p\overline{p}}$ = 630 GeV
$< 1.2 \times 10^{-5}$	90	⁵⁵¹ ALBAJAR	91 C	UA1	$E_{\rm cm}^{p\overline{p}}$ = 630 GeV
$< 4.3 \times 10^{-5}$	90	⁵⁵² AVERY	89 B	CLEO	$e^+e^- ightarrow ~\Upsilon(4S)$
$< 4.5 \times 10^{-5}$	90	⁵⁵³ ALBRECHT	87D /	ARG	$e^+e^- ightarrow ~\Upsilon(4S)$
$< 7.7 \times 10^{-5}$	90	⁵⁵⁴ AVERY	87	CLEO	$e^+e^- ightarrow ~\Upsilon(4S)$
$<2 \times 10^{-4}$	90	GILES	84	CLEO	Repl. by AVERY 87

⁵⁴⁵ Assumes production cross-section $\sigma(B_s)/\sigma(B^+) = 0.100/0.391$ and the CDF measured value of $\sigma(B^+) = 3.6 \pm 0.6 \ \mu b$.

⁵⁴⁶ Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

⁵⁴⁷ ABE 98 assumes production of $\sigma(B^0) = \sigma(B^+)$ and $\sigma(B_s)/\sigma(B^0) = 1/3$. They normalize to their measured $\sigma(B^0, p_T(B) > 6, |y| < 1.0) = 2.39 \pm 0.32 \pm 0.44 \,\mu\text{b}$.

⁵⁴⁸ ACCIARRI 97B assume PDG 96 production fractions for B^+ , B^0 , B_s , and Λ_b .

⁵⁴⁹ABE 96L assumes equal B^0 and B^+ production. They normalize to their measured $\sigma(B^+, p_T(B) > 6 \text{ GeV}/c, |y| < 1) = 2.39 \pm 0.54 \,\mu\text{b}.$

 $550 B^{0}$ and B_{s}^{0} are not separated.

⁵⁵¹ Obtained from unseparated B^0 and B_s^0 measurement by assuming a $B^0:B_s^0$ ratio 2:1. ⁵⁵² AVERY 89B reports $< 5 \times 10^{-3}$ assuming the $\Upsilon(4S)$ decays 43% to $B^0\overline{B}^0$. We rescale to 50%. 553 ALBRECHT 87D reports $< 5 \times 10^{-5}$ assuming the $\Upsilon(4S)$ decays 45% to $B^0 \overline{B}^0$. We

rescale to 50%. 554 AVERY 87 reports $< 9 \times 10^{-5}$ assuming the $\Upsilon(4S)$ decays 40% to $B^0 \overline{B}^0$. We rescale

to 50%.

 $\Gamma(K^0 e^+ e^-)/\Gamma_{\text{total}}$ Γ_{265}/Γ Test for $\Delta B = 1$ weak neutral current. Allowed by higher-order electroweak interactions.

VAL	UE (units 10^{-7})	CL%	DOCUMENT ID		TECN	COMMENT
<	5.4	90	⁵⁵⁵ ISHIKAWA	03	BELL	$e^+e^- ightarrow ~\Upsilon(4S)$
••	• we do not use the	e tollowi	ng data for averages	, fits	, iimits,	etc. • • •
-	$-2.1^{+2.3}_{-1.6}\pm0.8$		⁵⁵⁶ AUBERT	03 U	BABR	$e^+e^- \rightarrow \Upsilon(4S)$
<	27	90	⁵⁵⁶ ABE	02	BELL	Repl. by ISHIKAWA 03
<	38	90	⁵⁵⁶ AUBERT	02L	BABR	$e^+ e^- ightarrow ~ \Upsilon(4S)$
<	84.5	90	⁵⁵⁷ ANDERSON	01 B	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
<	3000	90	ALBRECHT	91E	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
<	5200	90	⁵⁵⁸ AVERY	87	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

⁵⁵⁵ Assumes equal production of B^0 and B^+ at $\Upsilon(4S)$. The second error is a total of systematic uncertainties including model dependence.

⁵⁵⁶ Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

 557 The result is for di-lepton masses above 0.5 GeV.

 558 AVERY 87 reports $< 6.5 imes 10^{-4}$ assuming the $\Upsilon(4S)$ decays 40% to $B^0 \overline{B}^0$. We rescale to 50%.

$$\Gamma(K^0\mu^+\mu^-)/\Gamma_{\text{total}}$$

 Γ_{266}/Γ

Test for $\Delta B = 1$ weak neutral current. Allowed by higher-order electroweak interactions.

VALUE (units 10^{-7}) CL% DOCUMENT ID TECN COMMENT **2.0** $^{+1.3}_{-1.0}$ **OUR AVERAGE** Error includes scale factor of 1.6. $1.63^{+0.82}_{-0.63}{\pm}0.14$ 559 AUBERT 03U BABR $e^+e^-
ightarrow \Upsilon(4S)$ ⁵⁶⁰ ISHIKAWA 03 BELL $e^+e^- \rightarrow \Upsilon(4S)$ $5.6 \ {+2.9 \atop -2.3} \ \pm 0.5$

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

< 33	90	⁵⁵⁹ ABE	02 BELL	Repl. by ISHIKAWA 03
< 36	90	AUBERT	02L BABR	$e^+e^- ightarrow ~\Upsilon(4S)$
< 66.4	90	⁵⁶¹ ANDERSON	01B CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
<5200	90	ALBRECHT	91e ARG	$e^+e^- \rightarrow \Upsilon(4S)$
<3600	90	⁵⁶² AVERY	87 CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

 559 Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. 560 Assumes equal production of B^0 and B^+ at $\Upsilon(4S)$. The second error is a total of systematic uncertainties including model dependence.

561 The result is for di-lepton masses above 0.5 GeV. 562 AVERY 87 reports $< 4.5 \times 10^{-4}$ assuming the $\Upsilon(4S)$ decays 40% to $B^0 \overline{B}^0$. We rescale to 50%.

Citation: S. Eidelman et al. (Particle Data Group), Phys. Lett. B 592, 1 (2004) and 2005 partial update for edition 2006 (URL: http://pdg.lbl.gov)

$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$\Gamma(K^0\ell^+\ell^-)/\Gamma_{\text{total}}$						Г267/Г
c6.890563 ISHIKAWA03BELL $e^+e^- \rightarrow T(45)$ 563 Assumes equal production of B^0 and B^+ at $T(45)$. $F(\mathbf{K}^*(892)^0 e^+e^-)/\Gamma_{total}$ Γ_{268}/Γ Test for $\Delta B = 1$ weak neutral current. Allowed by higher-order electroweak interactions. $TECN$ $COMMENT$ $VLUE (units 10^{-6})$ $CL\%$ $DOCUMENT ID$ $TECN$ $COMMENT$ < 2.4 90 564 ISHIKAWA03BELL $e^+e^- \rightarrow T(45)$ $< \cdot \cdot \cdot \cdot$ VW do not use the following data for averages, fits, limits, etc. $\cdot \cdot \cdot$ $1.11^{+0.56}_{-0.47} \pm 0.11$ 565 AUBERT03U BABR $e^+e^- \rightarrow T(45)$ < 6.7 90 565 AUBERT03U BABR $e^+e^- \rightarrow T(45)$ < 6.7 90 565 AUBERT03U BABR $e^+e^- \rightarrow T(45)$ < 290 90ALBRECHT91E ARG $e^+e^- \rightarrow T(45)$ < 766 < 6.7 90 565 AUBERT $02U$ BABR $e^+e^- \rightarrow T(45)$ < 565 Assumes equal production of B^0 and B^+ at $T(45)$. The second error is a total of systematic uncertainties including model dependence. 5656 Assumes equal production of B^+ and B^0 at the $T(45)$. $T269/\Gamma$ $T(\mathbf{K}^*(892)^0 \mu^+ \mu^-)/\Gamma_{total}$ $T260$ $T260$ $T260$ $T(\mathbf{L}^*(4692)^0 \mu^+ \mu^-)/\Gamma_{total}$ $T200$ $TECN$ $COMMENT$ $T22^+0.33$ $DOCUMENT ID$ $TECN$ $COMMENT$ $T22^+0.33$ $DOCUMENT ID$ $TECN$ $COMMENT$ $VALUE (units 10^{-6})$ $CL\%$ $DOCUMENT ID$ $TECN$ $VALUE (units 10^{-6})$ $CL\%$ $DOCUMENT ID$ $TECN$ $< $	VALUE (units 10^{-7})	CL%	DOCUM	ENT ID	TECN	COMMENT	2017
⁵⁶³ Assumes equal production of B ⁰ and B ⁺ at T(45). F (K*(992) ⁰ e ⁺ e ⁻)/ F _{total} Test for $\Delta B = 1$ weak neutral current. Allowed by higher-order electroweak interactions. <u>VALUE (units 10⁻⁶)</u> <u>CL%</u> <u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u> 4 (24) 90 564 ISHIKAWA 03 BELL $e^+e^- \rightarrow T(45)$ 5 · · We do not use the following data for averages, fits, limits, etc. • • • 1.11 ^{+0.56} ± 0.11 565 AUBERT 03U BABR $e^+e^- \rightarrow T(45)$ 5 · · We do not use the following model dependence. 5 · · We do not use the following model dependence. 5 · · V(45) 5 · · (45) 5 · · (45) 5 · · (45) 5 · · (45) 5 · · (45) 9 · · (45) 5 · · (45) 5 · · (45) 9 · · (45) 5 · · (45) 5 · · (45) 5 · · (46) 9 · · (47) 5 · · (45) 5 · · (46) 9 · · (47) 5 · · (45) 5 · · (46) 9 · · (47) 5 · · (45) 5 · · (46) 9 · · (47) 5 · · (48) 5 · · (42) 9 · · (48) 5 · · (43) 5 · · (43) 5 · · (43) 5 	<6.8	90	⁵⁶³ ISHIKA	WA 03	BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
F (K *(892) ⁰ e ⁺ e ⁻)/ F _{total} C ₀₅₀ Test for ΔB = 1 weak neutral current. Allowed by higher-order electroweak interactions. VALUE (units 10 ⁻⁶) <u>CL%</u> <u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u> < 2.4 90 564 [SHIKAWA 03 BELL e ⁺ e ⁻ → T(45) < 0.47 ±0.11 565 AUBERT 03U BABR e ⁺ e ⁻ → T(45) < 6.4 90 565 ABE 02 BELL Repl. by ISHIKAWA 03 < 6.7 90 565 AUBERT 02L BABR e ⁺ e ⁻ → T(45) < 6.4 90 565 AUBERT 02L BABR e ⁺ e ⁻ → T(45) < 6.4 90 565 AUBERT 02L BABR e ⁺ e ⁻ → T(45) < 6.6 4 90 565 AUBERT 02L BABR e ⁺ e ⁻ → T(45) < 6.7 90 ALBRECHT 91E ARG e ⁺ e ⁻ → T(45) < 764 Assumes equal production of B ⁰ and B ⁺ at T(45). The second error is a total of systematic uncertainties including model dependence. 505 Assumes equal production of B ⁺ and B ⁰ at the T(45). F (K *(892) ⁰ μ ⁺ μ ⁻)/ F total C 269/ F Test for ΔB = 1 weak neutral current. Allowed by higher-order electroweak interac- tions. 1.22^{+0.33} OUR AVERAGE 0.86 +0.79 ±0.11 566 AUBERT 03U BABR e ⁺ e ⁻ → T(45) 1.33 +0.42 ±0.11 566 AUBERT 03U BABR e ⁺ e ⁻ → T(45) i .33 +0.02 ±0.11 566 ABE 02 BELL e ⁺ e ⁻ → T(45) i .33 +0.02 ±0.11 566 ABE 02 BELL e ⁺ e ⁻ → T(45) i .33 +0.02 ±0.11 566 ABE 02 BELL e ⁺ e ⁻ → T(45) i .33 +0.02 ±0.11 566 ABE 02 BELL e ⁺ e ⁻ → T(45) i .33 +0.02 ±0.11 566 ABE 02 BELL e ⁺ e ⁻ → T(45) i .33 +0.02 ±0.11 566 ABE 02 BELL e ⁺ e ⁻ → T(45) i .33 +0.02 ±0.11 566 ABE 02 BELL e ⁺ e ⁻ → T(45) i .33 +0.02 ±0.11 566 ABE 02 BELL e ⁺ e ⁻ → T(45) i .33 +0.02 ±0.12	⁵⁶³ Assumes equal produ	uction c	f B^0 and B^+	at $\Upsilon(4S)$.			
tons. <i>VALUE</i> (units 10 ⁻⁶) <i>CL</i> [%] DOCUMENT <i>ID</i> TECN COMMENT <i>e</i> ⁺ <i>e</i> ⁻ → <i>T</i> (4 <i>S</i>) • • We do not use the following data for averages, fits, limits, etc. • • • 1.11 ^{+0.56} _{-0.47} ±0.11 ⁵⁶⁵ AUBERT 03U BABR <i>e</i> ⁺ <i>e</i> ⁻ → <i>T</i> (4 <i>S</i>) < 6.4 90 ⁵⁶⁵ ABE 02 BELL Repl. by ISHIKAWA 03 < 6.7 90 ⁵⁶⁵ AUBERT 02L BABR <i>e</i> ⁺ <i>e</i> ⁻ → <i>T</i> (4 <i>S</i>) <290 90 ALBRECHT 91E ARG <i>e</i> ⁺ <i>e</i> ⁻ → <i>T</i> (4 <i>S</i>) ⁵⁶⁴ Assumes equal production of <i>B</i> ⁰ and <i>B</i> ⁺ at <i>T</i> (4 <i>S</i>). The second error is a total of systematic uncertainties including model dependence. ⁵⁶⁵ Assumes equal production of <i>B</i> ⁺ and <i>B</i> ⁰ at the <i>T</i> (4 <i>S</i>). F (<i>K</i> [*] (892) ⁰ <i>μ</i> ⁺ <i>μ</i> ⁻)/ Γ total 7 269/ Γ Test for Δ <i>B</i> = 1 weak neutral current. Allowed by higher-order electroweak interac- tions. <i>VALUE</i> (units 10 ⁻⁶) <i>CL</i> [*] <i>DOCUMENT ID TECN COMMENT</i> 1.22^{+0.38} OUR AVERAGE 0.86 ^{+0.79} _{-0.58} ±0.11 ⁵⁶⁶ AUBERT 03U BABR <i>e</i> ⁺ <i>e</i> ⁻ → <i>T</i> (4 <i>S</i>) 1.33^{+0.42} _{-0.58} ±0.11 ⁵⁶⁷ ISHIKAWA 03 BELL <i>e</i> ⁺ <i>e</i> ⁻ → <i>T</i> (4 <i>S</i>) • • We do not use the following data for averages, fits, limits, etc. • • • < 4.2 90 ⁵⁶⁶ ABE 02 BELL <i>e</i> ⁺ <i>e</i> ⁻ → <i>T</i> (4 <i>S</i>) • • We do not use the following data for averages, fits, limits, etc. • • • < 4.2 90 ⁵⁶⁶ ABE 02 BELL <i>e</i> ⁺ <i>e</i> ⁻ → <i>T</i> (4 <i>S</i>) • • We do not use the following data for averages, fits, limits, etc. • • • < 4.2 90 ⁵⁶⁶ ABE 02 BELL <i>e</i> ⁺ <i>e</i> ⁻ → <i>T</i> (4 <i>S</i>) • • We do not use the following data for averages, fits, limits, etc. • • • < 4.2 90 ⁵⁶⁶ ABE 02 BELL <i>e</i> ⁺ <i>e</i> ⁻ → <i>T</i> (4 <i>S</i>) • • We do not use the following data for averages, fits, limits, etc. • • • < 4.2 90 ⁵⁶⁶ ABE 02 BELL <i>e</i> ⁺ <i>e</i> ⁻ → <i>T</i> (4 <i>S</i>) • • We do not use the following data for averages, fits, limits, etc. • • • < 4.2 90 ⁵⁶⁹ ABE 96 CDF <i>p p</i> at 1.8 TeV < 25 90 ⁵⁶⁹ ABE 96 LCF Repl. by AF- <u>EOLDER 998</u> < 23 90 ⁵⁷⁰ ALBAJAR 91C UA1 <u>E^{PD}_{CM} = 630 GeV</u> < 340 90 ALBRECHT 91E ARG <i>e⁺e⁻</i> → <i>T</i> (4 <i>S</i>) ⁵⁶⁶ AFSUDER 99B measured relative to <i>B</i> ⁰ → <i>J</i> /ψ(1 <i>S</i>) <i>K</i> *(892) ⁰ . ⁵⁶⁹ ABE 96L measure	Γ(K*(892)⁰ e⁺ e⁻) / Test for $\Delta B = 1$	F_{total} weak no	eutral current	. Allowed by	y higher	-order electr	Γ ₂₆₈ /Γ oweak interac-
$ \hline \hline$	tions. VALUE (units 10 ⁻⁶)	CL%	DOCUM	ENT ID	TECN	COMMENT	
••• We do not use the following data for averages, fits, limits, etc. ••• 1.11 $^{+0.56}_{-0.47} \pm 0.11$ 565 AUBERT 03U BABR $e^+e^- \rightarrow \Upsilon(4S)$ < 6.4 90 565 ABE 02 BELL Repl. by ISHIKAWA 03 < 6.7 90 565 AUBERT 02L BABR $e^+e^- \rightarrow \Upsilon(4S)$ 564 Assumes equal production of B^0 and B^+ at $\Upsilon(4S)$. The second error is a total of systematic uncertainties including model dependence. 565 Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. The second error is a total of systematic uncertainties including model dependence. 565 Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. T($K^*(892)^0 \mu^+ \mu^-)/\Gamma_{total}$ Test for $\Delta B = 1$ weak neutral current. Allowed by higher-order electroweak interac- tions. 7($K^*(892)^0 \mu^+ \mu^-)/\Gamma_{total}$ Test for $\Delta B = 1$ weak neutral current. Allowed by higher-order electroweak interac- tions. 7($L^*(892)^0 \mu^+ \mu^-)/\Gamma_{total}$ Test for $\Delta B = 1$ weak neutral current. Allowed by higher-order electroweak interac- tions. 7($L^*(892)^0 \mu^+ \mu^-)/\Gamma_{total}$ Test for $\Delta B = 1$ weak neutral current. Allowed by higher-order electroweak interac- tions. 7($L^*(892)^0 \mu^+ \mu^-)/\Gamma_{total}$ Test for $\Delta B = 1$ weak neutral current. Allowed by higher-order electroweak interac- tions. 7($L^*(892)^0 \mu^+ \mu^-)/\Gamma_{total}$ Test for $\Delta B = 1$ weak neutral current. Allowed by higher-order electroweak interac- tions. 7($L^*(48)^0 \mu^+ \mu^-)/\Gamma_{total}$ Test for $\Delta B = 1$ weak neutral current. Allowed by higher-order electroweak interac- tions. 7($L^*(892)^0 \mu^+ \mu^-)/\Gamma_{total}$ Test for $L^*(L^*(N))$ Test	< 2.4	90	⁵⁶⁴ ISHIKA	WA 03	BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
1.11 ^{+0.56} / _{-0.47} ± 0.11 565 AUBERT 03U BABR $e^+e^- \rightarrow \Upsilon(4S)$ < 6.4 90 565 ABE 02 BELL Repl. by ISHIKAWA 03 < 6.7 90 565 AUBERT 02L BABR $e^+e^- \rightarrow \Upsilon(4S)$ <290 90 ALBRECHT 91E ARG $e^+e^- \rightarrow \Upsilon(4S)$ 564 Assumes equal production of B^0 and B^+ at $\Upsilon(4S)$. The second error is a total of systematic uncertainties including model dependence. 565 Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. The second error is a total of systematic uncertainties including model dependence. 565 Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. Г ($K^*(892)^0 \mu^+ \mu^-$)/ Γ total Test for $\Delta B = 1$ weak neutral current. Allowed by higher-order electroweak interac- tions. VALUE (units 10 ⁻⁶) <u>CL%</u> <u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u> 1.22+0.33 OUR AVERAGE 0.86 ^{+0.79} / _{-0.53} ± 0.11 566 AUBERT 03U BABR $e^+e^- \rightarrow \Upsilon(4S)$ 1.22+0.33 OUR AVERAGE 0.86 ^{+0.79} / _{-0.53} ± 0.11 566 AUBERT 03U BABR $e^+e^- \rightarrow \Upsilon(4S)$ 1.33^{+0.42} / _{-0.37} ± 0.11 567 ISHIKAWA 03 BELL $e^+e^- \rightarrow \Upsilon(4S)$ 1.33^{+0.42} / _{-0.37} ± 0.11 566 ABE 02 BELL $e^+e^- \rightarrow \Upsilon(4S)$ 2.4 .0 90 566 ABE 02 BELL $e^+e^- \rightarrow \Upsilon(4S)$ 2.5 90 569 ABE 96L CDF $p\bar{p}$ at 1.8 TeV 2.5 90 569 ABE 96L CDF $p\bar{p}$ at 1.8 TeV 2.5 90 569 ABE 96L CDF Repl. by AF- EOLDER 99B measured relative to $B^0 \rightarrow J/\psi(1S)K^*(892)^0$. 566 Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. 567 Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. 568 AFFOLDER 99B measured relative to $B^0 \rightarrow J/\psi(1S)K^*(892)^0$. 569 ABE 96L measured relative to $B^0 \rightarrow J/\psi(1S)K^*(892)^0$. 569 ABE 96L measured relative to $B^0 \rightarrow J/\psi(1S)K^*(892)^0$. 569 ABE 96L measured relative to $B^0 \rightarrow J/\psi(1S)K^*(892)^0$. 569 ABE 96L measured relative to $B^0 \rightarrow J/\psi(1S)K^*(892)^0$. 569 ABE 96L measured relative to $B^0 \rightarrow J/\psi(1S)K^*(892)^0$. 569 ABE 96L measured relative to $B^0 \rightarrow J/\psi(1S)K^*(892)^0$. 569 ABE 96L measured relative to $B^0 \rightarrow J/\psi(1S)K^*(892)^0$. 569 ABE 96L measured relative to $B^0 \rightarrow J/\psi(1S)K^*(892)^0$. 569 ABE 96L measured relative to $B^0 \rightarrow J/\psi(1S)K^*(892$	$\bullet \bullet \bullet$ We do not use the	e follow	ing data for a	verages, fits	, limits,	etc. • • •	~ /
< 6.4 90 565 ABE 02 BELL Repl. by ISHIKAWA 03 < 6.7 90 565 AUBERT 02L BABR $e^+e^- \rightarrow \Upsilon(4S)$ </td <td>$1.11^{+0.56}_{-0.47}{\pm}0.11$</td> <td></td> <td>⁵⁶⁵ AUBER</td> <td>T 03∪</td> <td>BABR</td> <td>$e^+e^- \rightarrow$</td> <td>$\Upsilon(4S)$</td>	$1.11^{+0.56}_{-0.47}{\pm}0.11$		⁵⁶⁵ AUBER	T 03∪	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
< 6.7 90 ⁵⁰⁵ AUBERT 02L BABR $e^+e^- \rightarrow \Upsilon(4S)$ <290 90 ALBRECHT 91E ARG $e^+e^- \rightarrow \Upsilon(4S)$ ⁵⁶⁴ Assumes equal production of B^0 and B^+ at $\Upsilon(4S)$. The second error is a total of systematic uncertainties including model dependence. ⁵⁶⁵ Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. F ($K^*(892)^0 \mu^+ \mu^-)/\Gamma_{total}$ F ($K^*(892)^0 \ell^+ \ell^-)/\Gamma_{total}$ F ($E^+ \mu^+ \mu^+)/\Gamma_{total}$	< 6.4	90	⁵⁶⁵ ABE	02	BELL	Repl. by IS	SHIKAWA 03
$ \begin{array}{rcl} < 290 & 90 & ALBRECHT & 91E ARG & e^+ e^- \rightarrow T(45) \\ \hline 564 \text{ Assumes equal production of } B^0 \text{ and } B^+ \text{ at } T(45). & \text{The second error is a total of systematic uncertainties including model dependence.} \\ \hline 555 \text{ Assumes equal production of } B^+ \text{ and } B^0 \text{ at the } T(45). & \text{Test for } \Delta B = 1 \text{ weak neutral current. Allowed by higher-order electroweak interactions.} \\ \hline T(K^*(892)^0 \mu^+ \mu^-)/\Gamma_{\text{total}} & \Gamma_{269}/\Gamma \\ \hline \text{Test for } \Delta B = 1 \text{ weak neutral current. Allowed by higher-order electroweak interactions.} \\ \hline VALUE (units 10^{-6}) & CL\% & DOCUMENT ID & TECN & COMMENT \\ \hline 1.22^{+0.38}_{-0.37} \text{ dur AVERAGE} & O3U BABR & e^+ e^- \rightarrow T(45) \\ \hline 0.86^{+0.79}_{-0.58} \pm 0.11 & 5^{66} \text{ AUBERT} & 03U BABR & e^+ e^- \rightarrow T(45) \\ \hline 1.33^{+0.42}_{-0.37} \pm 0.11 & 5^{66} \text{ AUBERT} & 03U BABR & e^+ e^- \rightarrow T(45) \\ \hline 0.86^{+0.79}_{-0.37} \pm 0.11 & 5^{66} \text{ AUBERT} & 03U BABR & e^+ e^- \rightarrow T(45) \\ \hline 0.86^{+0.79}_{-0.37} \pm 0.11 & 5^{66} \text{ AUBERT} & 02 \text{ BELL } e^+ e^- \rightarrow T(45) \\ \hline 0.86^{+0.79}_{-0.37} \pm 0.11 & 5^{66} \text{ ABE} & 02 \text{ BELL } e^+ e^- \rightarrow T(45) \\ \hline 0.86^{+0.79}_{-0.37} \pm 0.11 & 5^{66} \text{ ABE} & 02 \text{ BELL } e^+ e^- \rightarrow T(45) \\ \hline 0.83 & AFFOLDER & 99B \text{ CDF } p\overline{p} \text{ at } 1.8 \text{ TeV} \\ \hline < 25 & 90 & 5^{69} \text{ ABE} & 96L \text{ CDF } \text{ Repl. by AF-} \\ \text{EOLDER 99B} \\ \hline < 23 & 90 & 5^{70} \text{ ALBAJAR} & 91C \text{ UA1} & E^{PP}_{Cm} = 630 \text{ GeV} \\ \hline < 340 & 90 & \text{ ALBRECHT} & 91E \text{ ARG } e^+ e^- \rightarrow T(45) \\ \hline 5^{66} \text{ Assumes equal production of } B^+ \text{ and } B^0 \text{ at the } T(45). \\ \hline 5^{67} \text{ Assumes equal production of } B^0 \text{ and } B^+ \text{ at } T(45). \\ \hline 5^{67} \text{ Assumes equal production of } B^0 \text{ and } B^+ \text{ at } T(45). \\ \hline 5^{67} \text{ Assumes equal production of } B^0 \text{ and } B^+ \text{ at } T(45). \\ \hline 5^{67} \text{ Assumes equal production of } B^0 \text{ and } B^+ \text{ at } T(45). \\ \hline 5^{67} \text{ Assumes equal production of } B^0 \text{ and } B^0 \text{ at the } T(45). \\ \hline 5^{67} \text{ Assumes equal production of } B^0 \text{ and } B^0 \text{ at the } T(45). \\ \hline 5^{67} \text{ Assumes equal production of } B^0 and $	< 6.7	90	⁵⁶⁵ AUBER	T 02L	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
⁵⁰⁴ Assumes equal production of B ⁰ and B ⁺ at $\Upsilon(4S)$. The second error is a total of systematic uncertainties including model dependence. ⁵⁰⁵ Assumes equal production of B ⁺ and B ⁰ at the $\Upsilon(4S)$. Г ($\mathcal{K}^*(892)^0 \mu^+ \mu^-$)/ Г total Г269 / Г Test for $\Delta B = 1$ weak neutral current. Allowed by higher-order electroweak interactions. <u>VALUE (units 10⁻⁶)</u> <u>CL%</u> <u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u> 1.22^{+0.38} OUR AVERAGE 0.86 ^{+0.79} ± 0.11 ⁵⁶⁶ AUBERT 03U BABR $e^+e^- \rightarrow \Upsilon(4S)$ 1.33 ^{+0.42} ± 0.11 ⁵⁶⁷ ISHIKAWA 03 BELL $e^+e^- \rightarrow \Upsilon(4S)$ ••• We do not use the following data for averages, fits, limits, etc. ••• < 4.2 90 ⁵⁶⁶ ABE 02 BELL $e^+e^- \rightarrow \Upsilon(4S)$ < 3.3 90 AUBERT 02L BABR $e^+e^- \rightarrow \Upsilon(4S)$ < 3.3 90 AUBERT 02L BABR $e^+e^- \rightarrow \Upsilon(4S)$ < 4.0 90 ⁵⁶⁸ AFFOLDER 99B CDF $p\overline{p}$ at 1.8 TeV < 25 90 ⁵⁶⁹ ABE 96L CDF Repl. by AF- EOLDER 99B < 23 90 ⁵⁷⁰ ALBAJAR 91C UA1 $E_{Cm}^{PP} = 630$ GeV < 340 90 ALBRECHT 91E ARG $e^+e^- \rightarrow \Upsilon(4S)$ ⁵⁶⁶ Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. The second error is a total of systematic uncertainties including model dependence. ⁵⁶⁸ AFFOLDER 99B measured relative to $B^0 \rightarrow J/\psi(1S) K^*(892)^0$. ⁵⁶⁹ ABE 96L measured relative to $B^0 \rightarrow J/\psi(1S) K^*(892)^0$. ⁵⁶⁹ ABE 96L measured relative to $B^0 \rightarrow J/\psi(1S) K^*(892)^0$. ⁵⁶⁹ ABE 96L measured relative to $B^0 \rightarrow J/\psi(1S) K^*(892)^0$. ⁵⁷⁰ ALBAJAR 91C assumes 36% of \overline{b} quarks give B^0 mesons. Г ($\mathcal{K}^*(892)^0 \ell^+ \ell^-$)/ Г total Г271 / Г VALUE (units 10 ⁻⁷) <u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u> 117^{+3,0}/₄+0.9 ⁵⁷¹ ISHIKAWA 03 BELL $e^+e^- \rightarrow \Upsilon(4S)$.	<290	90	ALBRE	CHT 91E	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$ \begin{split} & \Gamma(K^*(892)^0 \mu^+ \mu^-)/\Gamma_{\text{total}} & \Gamma_{269}/\Gamma \\ & \text{Test for } \Delta B = 1 \text{ weak neutral current. Allowed by higher-order electroweak interactions.} \\ \hline \text{VALUE (units } 10^{-6}) & CL\% & DOCUMENT ID & TECN & COMMENT \\ \hline \textbf{1.22}_{-0.38}^{+0.38} \text{ OUR AVERAGE} \\ & 0.86_{-0.58}^{+0.79} \pm 0.11 & 566 \text{ AUBERT} & 030 \text{ BABR } e^+e^- \rightarrow \Upsilon(4S) \\ & 1.33_{-0.37}^{+0.42} \pm 0.11 & 567 \text{ ISHIKAWA} & 03 \text{ BELL } e^+e^- \rightarrow \Upsilon(4S) \\ & \bullet \text{ We do not use the following data for averages, fits, limits, etc. } \bullet \bullet \bullet \\ & < 4.2 & 90 & 566 \text{ ABE} & 02 \text{ BELL } e^+e^- \rightarrow \Upsilon(4S) \\ & < 3.3 & 90 & \text{ AUBERT} & 021 \text{ BABR } e^+e^- \rightarrow \Upsilon(4S) \\ & < 4.0 & 90 & 568 \text{ AFFOLDER } 99 \text{ BCDF } p\overline{p} \text{ at } 1.8 \text{ TeV} \\ & < 25 & 90 & 569 \text{ ABE} & 961 \text{ CDF } Repl. \text{ by AF-} \\ & EOLDER 998 \\ & < 23 & 90 & 570 \text{ ALBAJAR} & 91C \text{ UA1} & E_{Cm}^{Dm} = 630 \text{ GeV} \\ & < 340 & 90 & \text{ ALBRECHT } 91\text{ E ARG } e^+e^- \rightarrow \Upsilon(4S) \\ & 566 \text{ Assumes equal production of } B^+ \text{ and } B^0 \text{ at the } \Upsilon(4S). \\ & 567 \text{ Assumes equal production of } B^0 \text{ and } B^+ \text{ at } \Upsilon(4S). & \text{The second error is a total of} \\ & \text{systematic uncertainties including model dependence.} \\ & 569 \text{ ABE 90L measured relative to } B^0 \rightarrow J/\psi(1S) K^*(892)^0. \\ & 569 \text{ ABE 90L measured relative to } B^0 \rightarrow J/\psi(1S) K^*(892)^0. \\ & 569 \text{ ABE 91C measured relative to } B^0 \rightarrow J/\psi(1S) K^*(892)^0. \\ & 570 \text{ ALBAJAR 91C assumes 36\% of } \overline{b} \text{ quarks give } B^0 \text{ mesons.} \\ & \Gamma(K^*(892)^0 \ell^+ \ell^-)/\Gamma_{\text{total}} & \Gamma_{271}/\Gamma \\ \hline \text{VALUE (units } 10^{-7}) & DOCUMENT 1D & TECN & COMMENT \\ \hline \textbf{117}^{+\frac{3}{2}} \theta + 0.9 & 571 \text{ ISH KAWA} & 03 & \text{BELL} e^+e^- \rightarrow \Upsilon(4S) \\ \hline \textbf{117}^{+\frac{3}{2}} \theta + 0.9 & 571 \text{ ISH KAWA} & 03 & \text{BELL} e^+e^- \rightarrow \Upsilon(4S) \\ \hline \textbf{117}^{+\frac{3}{2}} \theta + 0.9 & 571 \text{ ISH KAWA} & 03 & \text{BELL} e^+e^- \rightarrow \Upsilon(4S) \\ \hline \textbf{117}^{+\frac{3}{2}} \theta + 0.9 & 571 \text{ ISH KAWA} & 03 & \text{BELL} e^+e^- \rightarrow \Upsilon(4S) \\ \hline \textbf{117}^{+\frac{3}{2}} \theta + 0.9 & 571 \text{ ISH KAWA} & 03 & \text{BELL} e^+e^- \rightarrow \Upsilon(4S) \\ \hline \textbf{117}^{+\frac{3}{2}} \theta + 0.9 & 571 \text{ ISH KAWA} & 03 & \text{BELL} e^+e^- \rightarrow \Upsilon(4S) \\ \hline \textbf{117}^{+\frac{3}{2}} $	 ⁵⁰⁴ Assumes equal prod systematic uncertain ⁵⁶⁵ Assumes equal produ 	uction ties incl uction c	of B ^U and B uding model f B ⁺ and B ⁽	\mathcal{T}^+ at $\mathcal{T}(4S)$ dependence \mathcal{T}^0 at the $\mathcal{T}(4)$). The	second erro	r is a total of
VALUE (units 10^{-6})CL%DOCUMENT IDTECNCOMMENT1.22+0.38OUR AVERAGE $0.86^{+0.79}_{-0.58} \pm 0.11$ 566 AUBERT03U BABR $e^+e^- \rightarrow \Upsilon(4S)$ $1.33^{+0.42}_{-0.37} \pm 0.11$ 567 ISHIKAWA03 BELL $e^+e^- \rightarrow \Upsilon(4S)$ •••We do not use the following data for averages, fits, limits, etc.•••< 4.2	$\Gamma(K^*(892)^0 \mu^+ \mu^-)/$ Test for $\Delta B = 1$ tions	Γ_{total} weak no	eutral current	. Allowed by	y higher	-order electr	Γ₂₆₉/Γ oweak interac-
1.22 ^{+0.38} OUR AVERAGE 0.86 ^{+0.79} _{-0.58} ±0.11 5 ⁶⁶ AUBERT 03U BABR $e^+e^- \rightarrow \Upsilon(4S)$ 1.33 ^{+0.42} _{-0.37} ±0.11 5 ⁶⁷ ISHIKAWA 03 BELL $e^+e^- \rightarrow \Upsilon(4S)$ • • We do not use the following data for averages, fits, limits, etc. • • • < 4.2 90 5 ⁶⁶ ABE 02 BELL $e^+e^- \rightarrow \Upsilon(4S)$ < 3.3 90 AUBERT 02L BABR $e^+e^- \rightarrow \Upsilon(4S)$ < 4.0 90 5 ⁶⁸ AFFOLDER 99B CDF $p\bar{p}$ at 1.8 TeV < 25 90 5 ⁶⁹ ABE 96L CDF Repl. by AF- EOLDER 99B < 23 90 5 ⁷⁰ ALBAJAR 91C UA1 $E_{\rm Cm}^{\rm PP}$ = 630 GeV <340 90 ALBRECHT 91E ARG $e^+e^- \rightarrow \Upsilon(4S)$ 5 ⁶⁶ Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. The second error is a total of systematic uncertainties including model dependence. 5 ⁶⁸ AFFOLDER 99B measured relative to $B^0 \rightarrow J/\psi(1S) K^*(892)^0$. 5 ⁶⁹ ABE 96L measured relative to $B^0 \rightarrow J/\psi(1S) K^*(892)^0$. 5 ⁶⁹ ABE 96L measured relative to $B^0 \rightarrow J/\psi(1S) K^*(892)^0$. 5 ⁶⁹ ABE 96L measured relative to $B^0 \rightarrow J/\psi(1S) K^*(892)^0$. 5 ⁶⁹ ABE 96L measured relative to $B^0 \rightarrow J/\psi(1S) K^*(892)^0$. 5 ⁶⁹ ABE 96L measured relative to $B^0 \rightarrow J/\psi(1S) K^*(892)^0$. 5 ⁶⁹ ABE 96L measured relative to $B^0 \rightarrow J/\psi(1S) K^*(892)^0$. 5 ⁶⁹ ABE 96L measured relative to $B^0 \rightarrow J/\psi(1S) K^*(892)^0$. 5 ⁶⁹ ABE 96L measured relative to $B^0 \rightarrow J/\psi(1S) K^*(892)^0$. 5 ⁶⁹ ABE 96L measured relative to $B^0 \rightarrow J/\psi(1S) K^*(892)^0$. 5 ⁶⁰ ABE 96L measured relative to $B^0 \rightarrow J/\psi(1S) K^*(892)^0$. 5 ⁷⁰ ALBAJAR 91C assumes 36% of \overline{b} quarks give B^0 mesons. F ($K^*(892)^0 \ell^+ \ell^-$)/ Γ total Γ_{271}/Γ . VALUE (units 10 ⁻⁷) DOCUMENT ID $TECN$ COMMENT 117^{+3:9}+0.9 5^{71} ISHIKAWA 03 BELL $e^+e^- \rightarrow \Upsilon(4S)$.	VALUE (units 10^{-6})	CL%	DOCUM	ENT ID	TECN	COMMENT	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$1.22^{+0.38}_{-0.32}$ our a	/ERAG	E				
$1.33_{-0.37}^{+0.42} \pm 0.11$ $567 \text{ ISHIKAWA} 03 \text{ BELL } e^+e^- \rightarrow \Upsilon(4S)$ ••• We do not use the following data for averages, fits, limits, etc. ••• $4.2 90 566 \text{ ABE} 02 \text{ BELL } e^+e^- \rightarrow \Upsilon(4S)$ $3.3 90 \text{AUBERT} 02L \text{ BABR } e^+e^- \rightarrow \Upsilon(4S)$ $4.0 90 568 \text{ AFFOLDER} 998 \text{ CDF} p\overline{p} \text{ at } 1.8 \text{ TeV}$ $25 90 569 \text{ ABE} 96L \text{ CDF} \text{ Repl. by AF-} \text{EOLDER } 998$ $23 90 570 \text{ ALBAJAR} 91C \text{ UA1 } E_{Cm}^{PP} = 630 \text{ GeV}$ $340 90 \text{ALBRECHT} 91E \text{ ARG } e^+e^- \rightarrow \Upsilon(4S)$ $566 \text{ Assumes equal production of } B^+ \text{ and } B^0 \text{ at the } \Upsilon(4S).$ $567 \text{ Assumes equal production of } B^0 \text{ and } B^+ \text{ at } \Upsilon(4S).$ $568 \text{ AFFOLDER } 998 \text{ measured relative to } B^0 \rightarrow J/\psi(1S) K^*(892)^0.$ $568 \text{ AFFOLDER } 998 \text{ measured relative to } B^0 \rightarrow J/\psi(1S) K^*(892)^0.$ $570 \text{ ALBAJAR } 91C \text{ assumes } 36\% \text{ of } \overline{b} \text{ quarks give } B^0 \text{ mesons.}$ $\Gamma(K^*(892)^0 \ell^+ \ell^-)/\Gamma_{\text{total}} \qquad DOCUMENT \text{ ID} \qquad TECN COMMENT$ $11.7^+3.9 \pm 0.9 \qquad 571 \text{ ISHIKAWA} \qquad 03 \text{BELL} e^+e^- \rightarrow \Upsilon(4S)$	$0.86^{+0.79}_{-0.58}{\pm}0.11$		⁵⁶⁶ AUBER	T 03∪	BABR	$e^+e^- ightarrow$	$\Upsilon(4S)$
••• We do not use the following data for averages, fits, limits, etc. ••• < 4.2 90 ⁵⁶⁶ ABE 02 BELL $e^+e^- \rightarrow \Upsilon(4S)$ < 3.3 90 AUBERT 02L BABR $e^+e^- \rightarrow \Upsilon(4S)$ < 4.0 90 ⁵⁶⁸ AFFOLDER 99B CDF $p\overline{p}$ at 1.8 TeV < 25 90 ⁵⁶⁹ ABE 96L CDF Repl. by AF- EOLDER 99B < 23 90 ⁵⁷⁰ ALBAJAR 91C UA1 $E_{\rm Cm}^{P\overline{p}} = 630 \text{ GeV}$ < 340 90 ALBRECHT 91E ARG $e^+e^- \rightarrow \Upsilon(4S)$ ⁵⁶⁶ Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. ⁵⁶⁷ Assumes equal production of B^0 and B^+ at $\Upsilon(4S)$. The second error is a total of systematic uncertainties including model dependence. ⁵⁶⁸ AFFOLDER 99B measured relative to $B^0 \rightarrow J/\psi(1S) K^*(892)^0$. ⁵⁶⁹ ABE 96L measured relative to $B^0 \rightarrow J/\psi(1S) K^*(892)^0$. ⁵⁶⁹ ABE 96L measured relative to $B^0 \rightarrow J/\psi(1S) K^*(892)^0$. ⁵⁷⁰ ALBAJAR 91C assumes 36% of \overline{b} quarks give B^0 mesons. Г ($K^*(892)^0 \ell^+ \ell^-$)/ Γ_{total} VALUE (units 10 ⁻⁷) DOCUMENT ID TECN COMMENT 11.7^{+3.0}+0.9 ⁵⁷¹ ISHIKAWA 03 BELL $e^+e^- \rightarrow \Upsilon(4S)$	$1.33^{+0.42}_{-0.37}\pm0.11$		⁵⁶⁷ ISHIKA	WA 03	BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
< 4.2 90 ⁵⁶⁶ ABE 02 BELL $e^+e^- \rightarrow \Upsilon(4S)$ <	• • • We do not use the	e follow	ing data for a	verages, fits	, limits,	etc. • • •	
Solution of the second error is a total of systematic uncertainties including model dependence. Solution of the second error is a total of systematic uncertainties including model dependence. Solution of the second error is a total of systematic uncertainties including model dependence. Solution of the second error is a total of systematic uncertainties including model dependence. Solution of the second error is a total of systematic uncertainties including model dependence. Solution of the second error is a total of systematic uncertainties including model dependence. Solution of the second error is a total of the second error is a total of the second error is a total of the second error. Solution of the second error is a total of the second error is a total of the second error. Solution of the second error is a total of the second error. Solution of the second error is a total of the second error. Solution of the second error is a total of the second error. Solution of the second error is a total of the second error. Solution of the second error is a total of the second error. Solution of the second error is a total of the second error. Solution of the second error is a total of the second error. Solution of the second error is a total of the second error. Solution of the second error is a total of the second error. Solution of the second error is a total of the second error. Solution of the second error is a total of the second error. Solution of the second error is a total of the second error. Solution of the second error is a total of the second error. Solution of the second error is a total of the second error. Solution of the second error is a total of the second error. Solution of the second error is a total of the second error. Solution of the second error is a total of the second error is a total of the second error. Solution of the second error is a total of the second error is a total of the	< 4.2	90	⁵⁶⁶ ABE	02	BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
< 4.0 90 508 AFFOLDER 99B CDF $p\overline{p}$ at 1.8 TeV < 25 90 569 ABE 96L CDF Repl. by AF- EOLDER 99B < 23 90 570 ALBAJAR 91C UA1 $E_{cm}^{pp} = 630 \text{ GeV}$ < 340 90 ALBRECHT 91E ARG $e^+e^- \rightarrow \Upsilon(4S)$ 566 Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. 567 Assumes equal production of B^0 and B^+ at $\Upsilon(4S)$. The second error is a total of systematic uncertainties including model dependence. 568 AFFOLDER 99B measured relative to $B^0 \rightarrow J/\psi(1S)K^*(892)^0$. 569 ABE 96L measured relative to $B^0 \rightarrow J/\psi(1S)K^*(892)^0$. 569 ABE 96L measured relative to $B^0 \rightarrow J/\psi(1S)K^*(892)^0$. 570 ALBAJAR 91C assumes 36% of \overline{b} quarks give B^0 mesons. $\Gamma(K^*(892)^0 \ell^+ \ell^-)/\Gamma_{total}$ $TCUMENT ID$ $TECN$ $COMMENT$ $COMMENT$ $TECN$ $COMMENT$ <	< 3.3	90	AUBER	T 02L	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
	< 4.0	90	568 AFFOL	DER 99B	CDF	p p at 1.8	TeV
	< 25	90	⁵⁰⁹ ABE	96L	CDF	Repl. by A	F- P 00P
<340 90 ALBRECHT 91E ARG $e^+e^- \rightarrow \Upsilon(4S)$ 566 Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. 567 Assumes equal production of B^0 and B^+ at $\Upsilon(4S)$. The second error is a total of systematic uncertainties including model dependence. 568 AFFOLDER 99B measured relative to $B^0 \rightarrow J/\psi(1S) K^*(892)^0$. 569 ABE 96L measured relative to $B^0 \rightarrow J/\psi(1S) K^*(892)^0$ using PDG 94 branching ratios. 570 ALBAJAR 91C assumes 36% of \overline{b} quarks give B^0 mesons. F ($K^*(892)^0 \ell^+ \ell^-)/\Gamma_{\text{total}}$ D CUMENT ID T ECN C OMMENT 11.7^{+3.0} + 0.9 5 71 ISHIKAWA 03 BELL 6 ⁺ $e^- \rightarrow \Upsilon(4S)$	< 23	90	⁵⁷⁰ ALBAJ	AR 91c	UA1	$E_{cm}^{pp} = 630$	GeV
⁵⁶⁶ Assumes equal production of B ⁺ and B ⁰ at the $\Upsilon(4S)$. ⁵⁶⁷ Assumes equal production of B ⁰ and B ⁺ at $\Upsilon(4S)$. The second error is a total of systematic uncertainties including model dependence. ⁵⁶⁸ AFFOLDER 99B measured relative to B ⁰ → $J/\psi(1S) K^*(892)^0$. ⁵⁶⁹ ABE 96L measured relative to B ⁰ → $J/\psi(1S) K^*(892)^0$ using PDG 94 branching ratios. ⁵⁷⁰ ALBAJAR 91C assumes 36% of \overline{b} quarks give B ⁰ mesons. Γ ($K^*(892)^0 \ell^+ \ell^-$)/ Γ _{total} Γ ₂₇₁ / Γ Γ ₂₇₁ /	<340	90	ALBRE	CHT 91E	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
⁵⁶⁷ Assumes equal production of <i>B</i> ⁰ and <i>B</i> ⁺ at <i>Υ</i> (4 <i>S</i>). The second error is a total of systematic uncertainties including model dependence. ⁵⁶⁸ AFFOLDER 99B measured relative to $B^0 \rightarrow J/\psi(1S) K^*(892)^0$. ⁵⁶⁹ ABE 96L measured relative to $B^0 \rightarrow J/\psi(1S) K^*(892)^0$ using PDG 94 branching ratios. ⁵⁷⁰ ALBAJAR 91C assumes 36% of \overline{b} quarks give B^0 mesons. Γ (<i>K</i> *(892) ⁰ ℓ ⁺ ℓ ⁻)/ Γ _{total} <i>VALUE</i> (units 10 ⁻⁷) 11.7^{+3.9}+0.9 ⁵⁷¹ ISHIKAWA 03 BELL $e^+e^- \rightarrow \mathcal{Y}(4S)$	566 Assumes equal produ	iction o	f B^+ and B^0) at the $\Upsilon(4)$	S)		
$\Gamma(K^*(892)^0 \ell^+ \ell^-)/\Gamma_{\text{total}} \qquad \Gamma_{271}/\Gamma$ $\frac{VALUE \text{ (units 10}^{-7)}}{11.7^+ 3.9^+ + 0.9} \qquad \qquad 571 \text{ ISHIKAWA} \qquad 03 \text{ BELL} e^+ e^- \rightarrow \mathcal{X}(45)$	 ⁵⁶⁷ Assumes equal prod systematic uncertain ⁵⁶⁸ AFFOLDER 99B mea ⁵⁶⁹ ABE 96L measured re ⁵⁷⁰ ALBA IAB 91C assured 	uction ties incl asured elative t	of B^0 and B uding model relative to B^0 o $B^0 \rightarrow J/\psi$	f^+ at $\Upsilon(4S)$ dependence $J \rightarrow J/\psi(1S)$ $f(1S) K^*(892)$ give B^0 me). The 5) <i>K</i> *(89 2) ⁰ using	second erro 92) ⁰ . g PDG 94 br	r is a total of anching ratios.
VALUE (units 10^{-7})DOCUMENT IDTECNCOMMENT11.7+3.9+0.9571 ISHIKAWA03 RELL $e^+e^- \rightarrow \Upsilon(4S)$	Γ(K*(802)0 0+ 0-) /I			5.7C D IIIC			Га-т /Г
$11.7^{+3.9}_{-3.9}_{-1.0}_{-1.0} = 571 \text{ ISHIKAWA} \qquad 03 \text{ BELL} e^+e^- \rightarrow \Upsilon(AS)$	$VAUUE (upite 10^{-7})$	total	ΠΟΓΙΙΜ	NT ID	TECN	COMMENT	' 271/'
	11.7 ^{+3.9} ±0.9		571 ISHIKA	WA 0.3	BELI	$e^+e^- \rightarrow$	$\Upsilon(4S)$

 $^{571}\,\text{Assumes}$ equal production of B^0 and B^+ at $\varUpsilon(4S).$

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 $\Gamma(K^*(892)^0 \nu \overline{\nu}) / \Gamma_{\text{total}} \qquad \Gamma_{270} / \Gamma_{\text{total}}$ Test for $\Delta B = 1$ weak neutral current. Allowed by higher-order electroweak interactions.

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<1.0 × 10 ⁻³	90	572 ADAM	96D DLPH	$e^+e^- \rightarrow Z$
572 ADAM OFD	ſ	f 0.20 and f	0.10	

ADAM 96D assumes $f_{B^0} = f_{B^-} = 0.39$ and $f_{B_s} = 0.12$.

$\Gamma(e^{\pm}\mu^{\mp})/\Gamma_{\text{total}}$

 Γ_{272}/Γ

Test of lepton family number conservation. Allowed by higher-order electroweak interactions.

VALUE	<u>CL%</u>	DOCUMENT ID		<u>TECN</u>	COMMENT
$< 1.7 \times 10^{-7}$	90	⁵⁷³ CHANG	03	BELL	$e^+e^- ightarrow ~\Upsilon(4S)$
\bullet \bullet \bullet We do not use the	followi	ng data for averages	, fits	, limits,	etc. • • •
$< 15 \times 10^{-7}$	90	⁵⁷³ BERGFELD	00 B	CLE2	$e^+e^- ightarrow ~\Upsilon(4S)$
$< 3.5 \times 10^{-6}$	90	ABE	98v	CDF	<i>р<mark>р</mark> at 1.8 ТеV</i>
$< 1.6 \times 10^{-5}$	90	⁵⁷⁴ ACCIARRI	97 B	L3	$e^+e^- \rightarrow Z$
$< 5.9 \times 10^{-6}$	90	AMMAR	94	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
$< 3.4 \times 10^{-5}$	90	⁵⁷⁵ AVERY	89 B	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
$< 4.5 \times 10^{-5}$	90	⁵⁷⁶ ALBRECHT	87 D	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
$< 7.7 \times 10^{-5}$	90	⁵⁷⁷ AVERY	87	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
$< 3 \times 10^{-4}$	90	GILES	84	CLEO	Repl. by AVERY 87

 573 Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

⁵⁷⁴ ACCIARRI 97B assume PDG 96 production fractions for B^+ , B^0 , B_s , and Λ_b .

⁵⁷⁵ Paper assumes the $\Upsilon(4S)$ decays 43% to $B^0\overline{B}^0$. We rescale to 50%.

576 ALBRECHT 87D reports $< 5 \times 10^{-5}$ assuming the $\Upsilon(4S)$ decays 45% to $B^0 \overline{B}^0$. We rescale to 50%. 577 AVERY 87 reports $< 9 \times 10^{-5}$ assuming the $\Upsilon(4S)$ decays 40% to $B^0 \overline{B}^0$. We rescale

to 50%.

$\Gamma(\kappa^0 e^{\pm} \mu^{\mp}) / \Gamma_{\text{total}}$

 Γ_{273}/Γ

 Γ_{274}/Γ

Test of lepton family number conservation.

 $\frac{DOCUMENT ID}{578} \frac{TECN}{AUBERT} 02L BABR e^+e^- \rightarrow \Upsilon(4S)$ VALUE <u>CL%</u> <4.0 × 10⁻⁶ 90 ⁵⁷⁸ Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

$\Gamma(K^*(892)^0 e^{\pm} \mu^{\mp}) / \Gamma_{\text{total}}$

Test of lepton fam	ily num	ber conservation.			
VALUE	CL%	DOCUMENT ID	TECN	COMMENT	
<3.4 × 10 ⁻⁶	90	⁵⁷⁹ AUBERT	02L BABR	$e^+e^- ightarrow ~\Upsilon(4S)$	

⁵⁷⁹ Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

$\Gamma(e^{\pm}\tau^{\mp})/\Gamma_{\text{total}}$

 Γ_{275}/Γ

Test of lepton family number conservation. Allowed by higher-order electroweak interactions.

VALUE	<u>CL%</u>	DOCUMENT ID		TECN	<u>COMMENT</u>	
<1.1 × 10 ⁻⁴	90	BORNHEIM	04	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
\bullet \bullet \bullet We do not use the	following d	ata for averages	, fits,	, limits,	etc. • • •	
$< \! 5.3 imes 10^{-4}$	90	AMMAR	94	CLE2	Repl. by B	ORNHEIM 04

Citation: S. Eidelman et al. (Particle Data Group), Phys. Lett. B 592, 1 (2004) and 2005 partial update for edition 2006 (URL: http://pdg.lbl.gov)

 $\Gamma(\mu^{\pm}\tau^{\mp})/\Gamma_{\text{total}}$ Γ_{276}/Γ Test of lepton family number conservation. Allowed by higher-order electroweak interactions. VALUE <u>TECN</u> <u>COMMENT</u> CL% DOCUMENT ID $< 3.8 \times 10^{-5}$ 04 CLE2 $e^+e^- \rightarrow \Upsilon(4S)$ 90 BORNHEIM • • • We do not use the following data for averages, fits, limits, etc. • $< 8.3 \times 10^{-4}$ 90 94 CLE2 Repl. by BORNHEIM 04 AMMAR $\Gamma(\text{invisible})/\Gamma_{\text{total}}$ Γ_{277}/Γ $\frac{DOCUMENT \ ID}{580} \frac{TECN}{AUBERT,B} 04J BABR e^+ e^- \rightarrow \Upsilon(4S)$ *VALUE* (units 10^{-5}) CL% 90 <22 ⁵⁸⁰Uses the fully reconstructed $B^0 \rightarrow D^{(*)} - \ell^+ \nu_{\ell}$ events as a tag. $\Gamma(\nu \overline{\nu} \gamma) / \Gamma_{\text{total}}$ Γ₂₇₈/Γ $\frac{CL\%}{90} \quad \frac{DOCUMENT \ ID}{581 \ AUBERT, B} \quad \frac{TECN}{04J} \quad \frac{COMMENT}{BABR} \quad \frac{COMMENT}{e^+ e^-} \rightarrow \ \Upsilon(4S)$ VALUE (units 10^{-5}) <4.7 ⁵⁸¹Uses the fully reconstructed $B^0 \rightarrow D^{(*)} - \ell^+ \nu_\ell$ events as a tag.

POLARIZATION IN B⁰ DECAY

In decays involving two vector mesons, one can distinguish among the states in which meson palarizations are both longitudinal (L) or both are transverse and parallel (\parallel) or perpendicular (\perp) to one another.

Γ_L/Γ in $B^0 \rightarrow J/\psi(1S) K^*(892)^0$

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.605 ± 0.022 OUR AVE	RAGE				
$0.62\ \pm 0.02\ \pm 0.03$		⁵⁸² ABE	02N	BELL	$e^+e^- ightarrow ~\Upsilon(4S)$
$0.597\!\pm\!0.028\!\pm\!0.024$		⁵⁸³ AUBERT	01н	BABR	$e^+e^- ightarrow ~\Upsilon(4S)$
$0.59\ \pm 0.06\ \pm 0.01$		⁵⁸⁴ AFFOLDER	00N	CDF	<i>р</i> р at 1.8 ТеV
$0.52\ \pm 0.07\ \pm 0.04$		⁵⁸⁵ JESSOP	97	CLE2	$e^+e^- ightarrow ~\Upsilon(4S)$
$0.65\ \pm 0.10\ \pm 0.04$	65	ABE	95Z	CDF	<i>р<mark>р</mark> at 1.8 Те</i> V
$0.97\ \pm 0.16\ \pm 0.15$	13	⁵⁸⁶ ALBRECHT	94 G	ARG	$e^+e^- ightarrow ~\Upsilon(4S)$
$\bullet \bullet \bullet$ We do not use th	e followi	ng data for averages	, fits,	limits,	etc. • • •
$0.80\ \pm 0.08\ \pm 0.05$	42	⁵⁸⁶ ALAM	94	CLE2	Sup. by JESSOP 97
⁵⁸² Averaged over an admixture of B^0 and B^+ decays and the <i>P</i> wave fraction is $(19 \pm 2 \pm 3)\%$.					
⁵⁸³ Averaged over an ad	dmixture	of B^0 and B^- dec	ays a	nd the	P wave fraction is (16.0 \pm
$3.2 \pm 1.4) imes 10^{-2}$.					
⁵⁸⁴ AFFOLDER 00N measurements are based on 190 B^0 candidates obtained from a data sample of 89 pb ⁻¹ . The <i>P</i> -wave fraction is found to be $0.13 \substack{+0.12 \\ -0.09 \pm 0.06}$.					
⁵⁸⁵ JESSOP 97 is the average over a mixture of B^0 and B^+ decays. The <i>P</i> -wave fraction is found to be 0.16 + 0.08 + 0.04					
586 Averaged over an admixture of B^0 and B^+ decays.					
Γ_L/Γ in $B^0 \rightarrow \psi(2S) K^*(892)^0$					

VALUEDOCUMENT IDTECNCOMMENT0.45±0.11±0.04587RICHICHI01CLE2 $e^+e^- \rightarrow \Upsilon(4S)$ 587Annual and anatom Research of the state o

 587 Averages between charged and neutral B mesons.

$\Gamma_L/\Gamma \text{ in } B^0 \to D_s^{*+}D^{*-}$ VALUE	DOCUMENT ID	<u>TECNCOMME</u>	NT
0.52 ± 0.05 OUR AVERAGE $0.519 \pm 0.050 \pm 0.028$ $\frac{5}{2}$ $0.506 \pm 0.139 \pm 0.036$ $\frac{588}{588}$ Measurement performed using	⁵⁸⁸ AUBERT AHMED ; partial reconstruc	031 BABR e^+e^- 00B CLE2 e^+e^- on of D^{*-} decay.	$ ightarrow ~\Upsilon(4S)$ $ ightarrow ~\Upsilon(4S)$
$ \begin{array}{c} \Gamma_L/\Gamma \text{ in } B^0 \rightarrow D^{*-}\rho^+ \\ \underline{VALUE} & \underline{EVTS} \\ 0.885 \pm 0.016 \pm 0.012 \\ \bullet \bullet \bullet \text{ We do not use the following} \end{array} $	<u>DOCUMENT ID</u> CSORNA g data for averages	$\underline{\qquad TECN \qquad COMME}$ 03 CLE2 e^+e^- fits, limits, etc. • •	$ \rightarrow \Upsilon(4S) $
0.93 $\pm 0.05 \pm 0.05$ 76 Γ_{\perp}/Γ in $B^0 \rightarrow D^{*+}D^{*-}$ VALUE	ALAM <u>DOCUMENT ID</u>	94 CLE2 e ⁺ e ⁻ <u>TECN _COMME</u>	$ ightarrow ~ \Upsilon(4S)$
$0.063 \pm 0.055 \pm 0.009$ $\Gamma_{L} / \Gamma \text{ in } B^{0} \rightarrow \phi K^{*} (892)^{0}$	AUBERT	03Q BABR e^+e^-	$ ightarrow ~ \Upsilon(4S)$
VALUE 0.50 ± 0.05 OUR AVERAGE $0.52 \pm 0.05 \pm 0.02$ $0.41 \pm 0.10 \pm 0.04$ • • We do not use the following	DOCUMENT ID ³⁹ AUBERT,B CHEN g data for averages	<u>TECN</u> <u>COMMEN</u> 4W BABR e^+e^- 3B BELL e^+e^- fits, limits, etc. •	$rac{\tau}{2} ightarrow \Upsilon(4S) ightarrow \Upsilon(4S) ightarrow \Upsilon(4S) ightarrow ightarrow$
$0.65\pm0.07\pm0.02$ 589 AUBERT,B 04W also measure $0.22\pm0.05\pm0.02$ and the pha relative to the longitudinal am	AUBERT es the fraction of p ses of the parity-ev aplitude.	3V BABR Repl. by rity-odd transverse n and parity-odd tra	AUBERT, B 04w contribution $f_{\perp} =$ nsverse amplitudes
Γ_L/Γ in $B^0 \to \rho^+ \rho^-$	DOCUMENT ID	<u>TECN</u> COMMEN	Т
0.99±0.03 + 0.04 -0.03 • • • We do not use the following	AUBERT,B	4R BABR e^+e^- - fits, limits, etc. • •	$\rightarrow \Upsilon(4S)$
$0.98^{+0.02}_{-0.08}{\pm}0.03$	AUBERT	4G BABR Repl. by	AUBERT,B 04R

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$B^0 - \overline{B}^0$ MIXING PARAMETERS

For a discussion of $B^0-\overline{B}^0$ mixing see the note on " $B^0-\overline{B}^0$ Mixing" in the B^0 Particle Listings above.

 χ_d is a measure of the time-integrated $B^0_{-}\overline{B}^0$ mixing probability that a produced $B^0(\overline{B}^0)$ decays as a $\overline{B}^0(B^0)$. Mixing violates $\Delta B \neq 2$ rule.

$$\begin{split} \chi_d &= \frac{x_d^2}{2(1+x_d^2)} \\ \chi_d &= \frac{\Delta m_{B^0}}{\Gamma_{B^0}} = (m_{B^0_H} - m_{B^0_L}) \, \tau_{B^0} \, , \end{split}$$

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where *H*, *L* stand for heavy and light states of two B^0 *CP* eigenstates and $\tau_{B^0} = \frac{1}{0.5(\Gamma_{B^0_H} + \Gamma_{B^0_L})}$.

χd

This $B^0 - \overline{B}^0$ mixing parameter is the probability (integrated over time) that a produced B^0 (or \overline{B}^0) decays as a \overline{B}^0 (or B^0), e.g. for inclusive lepton decays

 $\begin{aligned} \chi_{d} &= \Gamma(B^{0} \to \ell^{-} X \text{ (via } \overline{B}^{0})) / \Gamma(B^{0} \to \ell^{\pm} X) \\ &= \Gamma(\overline{B}^{0} \to \ell^{+} X \text{ (via } B^{0})) / \Gamma(\overline{B}^{0} \to \ell^{\pm} X) \end{aligned}$

Where experiments have measured the parameter $r = \chi/(1-\chi)$, we have converted to χ . Mixing violates the $\Delta B \neq 2$ rule.

Note that the measurement of χ at energies higher than the $\Upsilon(4S)$ have not separated χ_d from χ_s where the subscripts indicate $B^0(\overline{b}d)$ or $B_s^0(\overline{b}s)$. They are listed in the $B^{\pm}/B^0/B_s^0/b$ -baryon ADMIXTURE section.

The experiments at $\Upsilon(4S)$ make an assumption about the $B^0 \overline{B}{}^0$ fraction and about the ratio of the B^{\pm} and B^0 semileptonic branching ratios (usually that it equals one).

"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 corrections between the measurements, includes χ_d calculated from Δm_{R^0} and τ_{R^0} .

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
0.187±0.003 OUR E	VALUATIO	N		
0.182 ± 0.015 OUR A	VERAGE			
$0.198\!\pm\!0.013\!\pm\!0.014$		⁵⁹⁰ BEHRENS	00B CLE2	$e^+e^- ightarrow ~\Upsilon(4S)$
$0.16\ \pm 0.04\ \pm 0.04$		⁵⁹¹ ALBRECHT	94 ARG	$e^+e^- ightarrow ~\Upsilon(4S)$
$0.149\!\pm\!0.023\!\pm\!0.022$		⁵⁹² BARTELT	93 CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
0.171 ± 0.048		⁵⁹³ ALBRECHT	92L ARG	$e^+e^- ightarrow ~\Upsilon(4S)$
\bullet \bullet \bullet We do not use th	e following	data for averages, f	its, limits, et	C. ● ● ●
$0.20\ \pm 0.13\ \pm 0.12$		⁵⁹⁴ ALBRECHT	96d ARG	$e^+e^- ightarrow ~\Upsilon(4S)$
$0.19 \ \pm 0.07 \ \pm 0.09$		⁵⁹⁵ ALBRECHT	96d ARG	$e^+e^- ightarrow ~\Upsilon(4S)$
$0.24\ \pm 0.12$		⁵⁹⁶ ELSEN	90 JADE	e^+e^- 35–44 GeV
$0.158 \substack{+ 0.052 \\ - 0.059}$		ARTUSO	89 CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
$0.17\ \pm 0.05$		⁵⁹⁷ ALBRECHT	871 ARG	$e^+e^- ightarrow ~\Upsilon(4S)$
<0.19	90	⁵⁹⁸ BEAN	87b CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
<0.27	90	⁵⁹⁹ AVERY	84 CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
500				

⁵⁹⁰ BEHRENS 00B uses high-momentum lepton tags and partially reconstructed $\overline{B}^0 \rightarrow D^{*+}\pi^-$, ρ^- decays to determine the flavor of the *B* meson.

⁵⁹¹ ALBRECHT 94 reports $r=0.194 \pm 0.062 \pm 0.054$. We convert to χ for comparison. Uses tagged events (lepton + pion from D^*).

⁵⁹² BARTELT 93 analysis performed using tagged events (lepton+pion from D^*). Using dilepton events they obtain 0.157 \pm 0.016^{+0.033}_{-0.028}.

⁵⁹³ ALBRECHT 92L is a combined measurement employing several lepton-based techniques. It uses all previous ARGUS data in addition to new data and therefore supersedes AL-BRECHT 87I. A value of $r = 20.6 \pm 7.0\%$ is directly measured. The value can be used

to measure x = $\Delta M/\Gamma$ = 0.72 \pm 0.15 for the B_d meson. Assumes f_{+-}/f_0 = 1.0 \pm 0.05 and uses $\tau_{B^{\pm}}/\tau_{B^{0}} = (0.95 \pm 0.14) (f_{+-}/f_{0})$.

⁵⁹⁴ Uses $D^{*+}K^{\pm}$ correlations. ⁵⁹⁵ Uses $(D^{*+}\ell^{-})K^{\pm}$ correlations.

 596 These experiments see a combination of B_s and B_d mesons.

 597 ALBRECHT 871 is inclusive measurement with like-sign dileptons, with tagged B decays plus leptons, and one fully reconstructed event. Measures $r=0.21\pm0.08$. We convert to χ for comparison. Superseded by ALBRECHT 92L.

 $^{598}\,{\rm BEAN}$ 87B measured $r<\,$ 0.24; we converted to $\chi.$

⁵⁹⁹Same-sign dilepton events. Limit assumes semileptonic BR for B^+ and B^0 equal. If B^0/B^\pm ratio <0.58, no limit exists. The limit was corrected in BEAN 87B from r< 0.30 to r < 0.37. We converted this limit to χ .

$\Delta m_{B^0} = m_{B^0_\mu} - m_{B^0_\mu}$

 Δm_{B^0} is a measure of 2π times the B^0 - \overline{B}^0 oscillation frequency in time-dependent mixing experiments.

The second "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 corrections between the measurements.

The first "OUR EVALUATION", also provided by the HFAG, includes Δm_d calculated from χ_d measured at $\Upsilon(4S)$.

0.505±0.005 OUR EVALUATION 0.505±0.005 OUR EVALUATION 0.511±0.005±0.006First Second0.511±0.005±0.006 600 ABE05B BELL $e^+e^- \rightarrow \Upsilon(4S)$ 0.531±0.025±0.007 601 ABDALLAH03B DLPH $e^+e^- \rightarrow \Upsilon(4S)$ 0.492±0.018±0.013 602 AUBERT03C BABR $e^+e^- \rightarrow \Upsilon(4S)$ 0.503±0.008±0.010 603 HASTINGS03 BELL $e^+e^- \rightarrow \Upsilon(4S)$ 0.509±0.017±0.020 604 ZHENG03 BELL $e^+e^- \rightarrow \Upsilon(4S)$ 0.516±0.016±0.010 605 AUBERT02I BABR $e^+e^- \rightarrow \Upsilon(4S)$ 0.493±0.012±0.009 606 AUBERT02J BABR $e^+e^- \rightarrow \Upsilon(4S)$ 0.497±0.024±0.025 607 ABBIENDI,G00B OPAL $e^+e^- \rightarrow Z$ 0.503±0.064±0.071 608 ABE $99 \ CDF$ $p \overline{p}$ at 1.8 TeV0.500±0.052±0.043 610 AFFOLDER $99 \ CDF$ $p \overline{p}$ at 1.8 TeV	VALUE $(10^{12} h s^{-1})$	EVTS DOCUM	1ENT ID TECN	COMMENT	
0.505 \pm 0.005 OUR EVALUATION Second $0.511 \pm 0.005 \pm 0.006$ 600 ABE $05B$ BELL $e^+e^- \rightarrow \Upsilon(4S)$ $0.531 \pm 0.025 \pm 0.007$ 601 ABDALLAH $03B$ DLPH $e^+e^- \rightarrow Z$ $0.492 \pm 0.018 \pm 0.013$ 602 AUBERT $03C$ BABR $e^+e^- \rightarrow \Upsilon(4S)$ $0.503 \pm 0.008 \pm 0.010$ 603 HASTINGS 03 BELL $e^+e^- \rightarrow \Upsilon(4S)$ $0.509 \pm 0.017 \pm 0.020$ 604 ZHENG 03 BELL $e^+e^- \rightarrow \Upsilon(4S)$ $0.516 \pm 0.016 \pm 0.010$ 605 AUBERT 021 BABR $e^+e^- \rightarrow \Upsilon(4S)$ $0.493 \pm 0.012 \pm 0.009$ 606 AUBERT 021 BABR $e^+e^- \rightarrow \Upsilon(4S)$ $0.497 \pm 0.024 \pm 0.025$ 607 ABBIENDI,G 008 OPAL $e^+e^- \rightarrow Z$ $0.503 \pm 0.064 \pm 0.071$ 608 ABE $99 \times CDF$ $p\overline{p}$ at 1.8 TeV $0.500 \pm 0.052 \pm 0.043$ 610 AFFOLDER $99C$ CDF $p\overline{p}$ at 1.8 TeV	0.505 ± 0.005 OUR EVAL	UATION First			
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$0.503 \pm 0.008 \pm 0.010$ 603 HASTINGS 03 BELL $e^+e^- \rightarrow \Upsilon(4S)$ $0.509 \pm 0.017 \pm 0.020$ 604 ZHENG 03 BELL $e^+e^- \rightarrow \Upsilon(4S)$ $0.516 \pm 0.016 \pm 0.010$ 605 AUBERT 021 BABR $e^+e^- \rightarrow \Upsilon(4S)$ $0.493 \pm 0.012 \pm 0.009$ 606 AUBERT 021 BABR $e^+e^- \rightarrow \Upsilon(4S)$ $0.497 \pm 0.024 \pm 0.025$ 607 ABBIENDI,G 008 OPAL $e^+e^- \rightarrow \Upsilon(4S)$ $0.503 \pm 0.064 \pm 0.071$ 608 ABE $99 \ltimes$ CDF $p \overline{p}$ at 1.8 TeV $0.500 \pm 0.052 \pm 0.043$ 609 ABE 990 CDF $p \overline{p}$ at 1.8 TeV $0.516 \pm 0.099 + 0.029 - 0.035$ 610 AFFOLDER $99C$ CDF $p \overline{p}$ at 1.8 TeV	$0.492\!\pm\!0.018\!\pm\!0.013$	⁶⁰² AUBEI	RT 03C BABR	$e^+ e^- ightarrow ~\Upsilon(4S)$	
$0.509 \pm 0.017 \pm 0.020$ 604 ZHENG 03 BELL $e^+e^- \rightarrow \Upsilon(4S)$ $0.516 \pm 0.016 \pm 0.010$ 605 AUBERT 021 BABR $e^+e^- \rightarrow \Upsilon(4S)$ $0.493 \pm 0.012 \pm 0.009$ 606 AUBERT 021 BABR $e^+e^- \rightarrow \Upsilon(4S)$ $0.497 \pm 0.024 \pm 0.025$ 607 ABBIENDI,G 008 OPAL $e^+e^- \rightarrow \Upsilon(4S)$ $0.503 \pm 0.064 \pm 0.071$ 608 ABE $99 \ltimes$ CDF $p \overline{p}$ at 1.8 TeV $0.500 \pm 0.052 \pm 0.043$ 609 ABE 990 CDF $p \overline{p}$ at 1.8 TeV $0.516 \pm 0.099 + 0.029 - 0.035$ 610 AFFOLDER $99C$ CDF $p \overline{p}$ at 1.8 TeV	$0.503\!\pm\!0.008\!\pm\!0.010$	⁶⁰³ HASTI	INGS 03 BELL	$e^+e^- \rightarrow \Upsilon(4S)$	
$0.516 \pm 0.016 \pm 0.010$ 605 AUBERT 021 BABR $e^+ e^- \rightarrow \Upsilon(4S)$ $0.493 \pm 0.012 \pm 0.009$ 606 AUBERT $02J \text{ BABR}$ $e^+ e^- \rightarrow \Upsilon(4S)$ $0.497 \pm 0.024 \pm 0.025$ 607 ABBIENDI,G 008 OPAL $e^+ e^- \rightarrow Z$ $0.503 \pm 0.064 \pm 0.071$ 608 ABE $99 \text{K} \text{ CDF}$ $p \overline{p} \text{ at } 1.8 \text{ TeV}$ $0.500 \pm 0.052 \pm 0.043$ 609 ABE $99 \text{Q} \text{ CDF}$ $p \overline{p} \text{ at } 1.8 \text{ TeV}$ $0.516 \pm 0.099 \stackrel{+}{-} 0.035$ 610 AFFOLDER $99 \text{C} \text{ CDF}$ $p \overline{p} \text{ at } 1.8 \text{ TeV}$	$0.509\!\pm\!0.017\!\pm\!0.020$	⁶⁰⁴ ZHEN	G 03 BELL	$e^+e^- \rightarrow \Upsilon(4S)$	
$0.493 \pm 0.012 \pm 0.009$ 606 AUBERT $02J$ BABR $e^+e^- \rightarrow \Upsilon(4S)$ $0.497 \pm 0.024 \pm 0.025$ 607 ABBIENDI,G 008 OPAL $e^+e^- \rightarrow Z$ $0.503 \pm 0.064 \pm 0.071$ 608 ABE $99 \ltimes$ CDF $p\overline{p}$ at 1.8 TeV $0.500 \pm 0.052 \pm 0.043$ 609 ABE $99 \complement$ CDF $p\overline{p}$ at 1.8 TeV $0.516 \pm 0.099 + 0.029 - 0.035$ 610 AFFOLDER $99 \complement$ CDF $p\overline{p}$ at 1.8 TeV	$0.516\!\pm\!0.016\!\pm\!0.010$	⁶⁰⁵ AUBEI	RT 021 BABR	$e^+e^- \rightarrow \Upsilon(4S)$	
$0.497 \pm 0.024 \pm 0.025$ 607 ABBIENDI,G 008 OPAL $e^+e^- \rightarrow Z$ $0.503 \pm 0.064 \pm 0.071$ 608 ABE 99K CDF $p \overline{p}$ at 1.8 TeV $0.500 \pm 0.052 \pm 0.043$ 609 ABE 99Q CDF $p \overline{p}$ at 1.8 TeV $0.516 \pm 0.099 {+} 0.029 {-} 0.035$ 610 AFFOLDER 99C CDF $p \overline{p}$ at 1.8 TeV	$0.493\!\pm\!0.012\!\pm\!0.009$	⁶⁰⁶ AUBEI	RT 02J BABR	$e^+e^- \rightarrow \Upsilon(4S)$	
$0.503 \pm 0.064 \pm 0.071$ 608 ABE $99 \text{K} \text{ CDF}$ $p \overline{p} \text{ at } 1.8 \text{ TeV}$ $0.500 \pm 0.052 \pm 0.043$ 609 ABE $99 \text{Q} \text{ CDF}$ $p \overline{p} \text{ at } 1.8 \text{ TeV}$ $0.516 \pm 0.099 {+} 0.029 {-} 0.035$ 610 AFFOLDER $99 \text{C} \text{ CDF}$ $p \overline{p} \text{ at } 1.8 \text{ TeV}$	$0.497 \!\pm\! 0.024 \!\pm\! 0.025$	⁶⁰⁷ ABBIE	NDI,G 00B OPAL	$e^+e^- \rightarrow Z$	
$0.500 \pm 0.052 \pm 0.043$ 609 ABE $99Q$ CDF $p\overline{p}$ at 1.8 TeV $0.516 \pm 0.099 + 0.029 - 0.035$ 610 AFFOLDER $99C$ CDF $p\overline{p}$ at 1.8 TeV	$0.503\!\pm\!0.064\!\pm\!0.071$	⁶⁰⁸ ABE	99к CDF	<i>р<mark>р</mark> at 1.8 TeV</i>	
$0.516 \pm 0.099 + 0.029 = 0.035$ 610 AFFOLDER 99C CDF $p\overline{p}$ at 1.8 TeV	$0.500\!\pm\!0.052\!\pm\!0.043$	⁶⁰⁹ ABE	99Q CDF	<i>р<mark>р</mark> at 1.8 TeV</i>	
	$0.516 \!\pm\! 0.099 \!+\! 0.029 \!-\! 0.035$	⁶¹⁰ AFFOI	LDER 99C CDF	<i>pp</i> at 1.8 TeV	
$0.471^{+0.078}_{-0.068} + 0.033_{-0.034}$ 611 ABE 98C CDF $p\overline{p}$ at 1.8 TeV	$0.471 \substack{+ 0.078 + 0.033 \\ - 0.068 - 0.034}$	⁶¹¹ ABE	98c CDF	<i>р</i> рат 1.8 ТеV	
$0.458 \pm 0.046 \pm 0.032$ 612 ACCIARRI 98D L3 $e^+e^- \rightarrow Z$	$0.458 \!\pm\! 0.046 \!\pm\! 0.032$	⁶¹² ACCIA	RRI 98D L3	$e^+e^- \rightarrow Z$	
$0.437 \pm 0.043 \pm 0.044$ 613 ACCIARRI 98D L3 $e^+e^- \rightarrow Z$	$0.437\!\pm\!0.043\!\pm\!0.044$	⁶¹³ ACCIA	RRI 98D L3	$e^+e^- \rightarrow Z$	
$0.472 \pm 0.049 \pm 0.053$ 614 ACCIARRI 98D L3 $e^+e^- \rightarrow Z$	$0.472\!\pm\!0.049\!\pm\!0.053$	⁶¹⁴ ACCIA	RRI 98D L3	$e^+e^- \rightarrow Z$	
$0.523 \pm 0.072 \pm 0.043$ 615 ABREU 97N DLPH $e^+e^- \rightarrow Z$	$0.523\!\pm\!0.072\!\pm\!0.043$	⁶¹⁵ ABRE	U 97N DLPH	$e^+e^- \rightarrow Z$	
$0.493 \pm 0.042 \pm 0.027$ 613 ABREU 97N DLPH $e^+e^- \rightarrow Z$	$0.493 \!\pm\! 0.042 \!\pm\! 0.027$	⁶¹³ ABRE	U 97N DLPH	$e^+e^- \rightarrow Z$	
$0.499 \pm 0.053 \pm 0.015$ 616 ABREU 97N DLPH $e^+e^- \rightarrow Z$	$0.499 \!\pm\! 0.053 \!\pm\! 0.015$	⁶¹⁶ ABRE	U 97N DLPH	$e^+e^- \rightarrow Z$	
$0.480 \pm 0.040 \pm 0.051$ 612 ABREU 97N DLPH $e^+e^- \rightarrow Z$	$0.480\!\pm\!0.040\!\pm\!0.051$	⁶¹² ABRE	U 97N DLPH	$e^+e^- \rightarrow Z$	

$0.444 \!\pm\! 0.029 \!+\! 0.020 \!-\! 0.017$	⁶¹³ ACKERSTAFF	970 OPAL	$e^+e^- \rightarrow Z$
$0.430 \!\pm\! 0.043 \!+\! 0.028 \\ -\! 0.030$	⁶¹² ACKERSTAFF	97V OPAL	$e^+e^- \rightarrow Z$
$0.482\!\pm\!0.044\!\pm\!0.024$	⁶¹⁷ BUSKULIC	97d ALEP	$e^+e^- \rightarrow Z$
$0.404\!\pm\!0.045\!\pm\!0.027$	⁶¹³ BUSKULIC	97d ALEP	$e^+e^- \rightarrow Z$
$0.452\!\pm\!0.039\!\pm\!0.044$	⁶¹² BUSKULIC	97d ALEP	$e^+e^- \rightarrow Z$
$0.539\!\pm\!0.060\!\pm\!0.024$	⁶¹⁸ ALEXANDER	96∨ OPAL	$e^+e^- \rightarrow Z$
$0.567 \!\pm\! 0.089 \!+\! 0.029 \\ - 0.023$	⁶¹⁹ ALEXANDER	96V OPAL	$e^+e^- \rightarrow Z$
$\bullet \bullet \bullet$ We do not use the following	ng data for averages	, fits, limits,	etc. ● ● ●
$0.516\!\pm\!0.016\!\pm\!0.010$	⁶²⁰ AUBERT	02N BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$0.494\!\pm\!0.012\!\pm\!0.015$	⁶²¹ HARA	02 BELL	Repl. by ABE 05B
$0.528\!\pm\!0.017\!\pm\!0.011$	⁶²² TOMURA	02 BELL	Repl. by ABE 05B
$0.463 \!\pm\! 0.008 \!\pm\! 0.016$	⁶⁰⁶ ABE	01D BELL	Repl. by HASTINGS 03
$0.444 \!\pm\! 0.028 \!\pm\! 0.028$	⁶²³ ACCIARRI	98d L3	$e^+e^- \rightarrow Z$
0.497 ± 0.035	⁶²⁴ ABREU	97N DLPH	$e^+e^- \rightarrow Z$
$0.467 {\pm} 0.022 {+} 0.017 \\ {-} 0.015$	⁶²⁵ ACKERSTAFF	97∨ OPAL	$e^+e^- \rightarrow Z$
0.446 ± 0.032	⁶²⁶ BUSKULIC	97d ALEP	$e^+e^- \rightarrow Z$
$0.531^{+0.050}_{-0.046} \pm 0.078$	⁶²⁷ ABREU	96Q DLPH	Sup. by ABREU 97N
$0.496^{+0.055}_{-0.051} {\pm} 0.043$	⁶¹² ACCIARRI	96e L3	Repl. by ACCIARRI 98D
$0.548 \!\pm\! 0.050 \!+\! 0.023 \\ -\! 0.019$	⁶²⁸ ALEXANDER	96V OPAL	$e^+e^- \rightarrow Z$
0.496 ± 0.046	⁶²⁹ AKERS	95J OPAL	Repl. by ACKER- STAFF 97∨
$0.462^{+0.040}_{-0.053}{}^{+0.052}_{-0.035}$	⁶¹² AKERS	95J OPAL	Repl. by ACKER-
$0.50\ \pm 0.12\ \pm 0.06$	⁶¹⁵ ABREU	94M DLPH	Sup. by ABREU 97N
$0.508\!\pm\!0.075\!\pm\!0.025$	⁶¹⁸ AKERS	94c OPAL	Repl. by ALEXAN-
$0.57 \pm 0.11 \pm 0.02$ 153	⁶¹⁹ AKERS	94н OPAL	DER 96V Repl. by ALEXAN- DER 96V
$\begin{array}{rrrr} 0.50 & +0.07 & +0.11 \\ & -0.06 & -0.10 \end{array}$	⁶¹² BUSKULIC	94b ALEP	Sup. by BUSKULIC 97D
$\begin{array}{rrrr} 0.52 & +0.10 & +0.04 \\ & -0.11 & -0.03 \end{array}$	⁶¹⁹ BUSKULIC	93ĸ ALEP	Sup. by BUSKULIC 97D

⁶⁰⁰ Measurement performed using a combined fit of *CP*-violation, mixing and lifetimes.

⁶⁰¹ Events with a high transverse momentum lepton were removed and an inclusively reconstructed vertex was required.

⁶⁰² AUBERT 03C uses a sample of approximately 14,000 exclusively reconstructed $B^0 \rightarrow D^*(2010)^- \ell \nu$ and simultaneously measures the lifetime and oscillation frequency.

⁶⁰³ HASTINGS 03 measurement based on the time evolution of dilepton events. It also reports $f_+/f_0 = 1.01 \pm 0.03 \pm 0.09$ and *CPT* violation parameters in $B^0-\overline{B}^0$ mixing.

⁶⁰⁴ZHENG 03 data analyzed using partially reconstructed $\overline{B}^0 \rightarrow D^{*-}\pi^+$ decay and a flavor tag based on the charge of the lepton from the accompanying *B* decay.

 605 Uses a tagged sample of fully-reconstructed neutral B decays at $\Upsilon(4S).$

 606 Measured based on the time evolution of dilepton events in $\Upsilon(4S)$ decays.

⁶⁰⁷ Data analyzed using partially reconstructed $\overline{B}^0 \rightarrow D^{*+} \ell^- \overline{\nu}$ decay and a combination of flavor tags from the rest of the event.

608 Uses di-muon events.

⁶⁰⁹ Uses jet-charge and lepton-flavor tagging.

⁶¹⁰ Uses $\ell^- D^{*+} - \ell$ events.

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⁶¹¹Uses π -B in the same side. 612 Uses *l*-*l*. 613 Uses ℓ-Q_{hem}. 614 Uses $\ell\text{-}\ell$ with impact parameters. ⁶¹⁵Uses $D^{\pm}-Q_{\text{hem}}$. ⁶¹⁶Uses $\pi_s^{\pm}\ell$ - Q_{hem} . 617 Uses $D^{*\pm}-\ell/Q_{hem}$ ⁶¹⁸Uses $D^{\pm}\ell$ - Q_{hem} . 619 Uses $D^{\pm}-\ell$. 620 AUBERT 02N result based on the same analysis and data sample reported in AUBERT 021. ⁶²¹Uses a tagged sample of B^0 decays reconstructed in the mode $B^0 \rightarrow D^* \ell \nu$. ⁶²²Uses a tagged sample of fully-reconstructed hadronic B^0 decays at $\Upsilon(4S)$. 623 ACCIARRI 98D combines results from ℓ - ℓ , ℓ - Q_{hem} , and ℓ - ℓ with impact parameters. ⁶²⁴ ABREU 97N combines results from $D^{*\pm}-Q_{\text{hem}}$, ℓ - Q_{hem} , $\pi_s^{\pm}\ell$ - Q_{hem} , and ℓ - ℓ . ⁶²⁵ ACKERSTAFF 97V combines results from ℓ - ℓ , ℓ - Q_{hem} , D^* - ℓ , and $D^{*\pm}$ - Q_{hem} . 626 BUSKULIC 97D combines results from $D^{*\pm}$ - ℓ/Q_{hem} , ℓ - Q_{hem} , and ℓ - ℓ . ⁶²⁷ ABREU 96Q analysis performed using lepton, kaon, and jet-charge tags.

⁶²⁸ ALEXANDER 96V combines results from $D^{*\pm}-\ell$ and $D^{*\pm}\ell-Q_{hem}$.

⁶²⁹AKERS 95J combines results from charge measurement, $D^{\pm}\ell$ - Q_{hem} and ℓ - ℓ .

$x_d = \Delta m_{B^0} / \Gamma_{B^0}$

The second "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 corrections between the measurements.

The first "OUR EVALUATION", also provided by the HFAG, includes χ_d measured at $\Upsilon(4S)$.

VALUE

DOCUMENT ID 0.774±0.009 OUR EVALUATION First 0.774±0.009 OUR EVALUATION Second

$\operatorname{Re}(\lambda_{CP} / |\lambda_{CP}|) \operatorname{Re}(z)$

The λ_{CP} characterizes B^0 and \overline{B}^0 decays to states of charmonium plus K_{I}^0 . Parameter z is used to describe CPT violation in mixing, see the review on "CP Violation" in the reviews section.

VALUE	DOCUMENT ID	TECN	<u>COMMENT</u>
$0.014 \pm 0.035 \pm 0.034$	630 AUBERT,B	04c BABR	$e^+e^- ightarrow \Upsilon(4S)$
630 Corresponds to 90% confide			

Re(z)

VALUE	DOCUMENT ID		TECN	<u>COMMENT</u>	
$0.00 \pm 0.12 \pm 0.01$	⁶³¹ HASTINGS	03	BELL	$e^+e^- ightarrow ~\Upsilon(4S)$	
631 Measured using inclusive d	ilepton events from <i>E</i>	3 ⁰ de	cay.		

lm(z)					
VALUE	DOCUMENT ID	TECN	COMMENT		
-0.002 ± 0.033 OUR AVERAGE	Error includes sca	ale factor of 1	.4.	_	
$0.038\!\pm\!0.029\!\pm\!0.025$	⁶³² AUBERT,B	04c BABR	$e^+e^- ightarrow ~\Upsilon(4S)$		
$-0.03\ \pm 0.01\ \pm 0.03$	⁶³³ HASTINGS	03 BELL	$e^+e^- ightarrow ~\Upsilon(4S)$		
632 Corresponds to 90% confidence range [-0.028, 0.104]. 633 Measured using inclusive dilepton events from B^0 decay.					

CP VIOLATION PARAMETERS

$\operatorname{Re}(\epsilon_{B^0})/(1+|\epsilon_{B^0}|^2)$

CP impurity in B_d^0 system. It is obtained from either $a_{\ell\ell}$, the charge asymmetry in like-sign dilepton events or a_{cp} , the time-dependent asymmetry of inclusive B^0 and \overline{B}^0 decays.

"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 corrections between the measurements.

VALUE (units 10 ⁻³)	DOCUMENT ID	TECN	COMMENT
$-$ 1.3 \pm 2.9 OUR EVALUATI	ON		
$-$ 1.2 \pm 3.0 OUR AVERAGE			
$-14.7\pm~6.7\pm5.7$	⁶³⁴ AUBERT,B	04C BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$1.2\pm~2.9\pm3.6$	⁶³⁵ AUBERT	02ĸ BABR	$e^+e^- ightarrow ~\Upsilon(4S)$
$- 3.2 \pm 6.5$	⁶³⁶ BARATE	01D ALEP	$e^+e^- \rightarrow Z$
$3.5\!\pm\!10.3\!\pm\!1.5$	⁶³⁷ JAFFE	01 CLE2	$e^+e^- ightarrow ~\Upsilon(4S)$
$1.2 \pm 13.8 \pm 3.2$	⁶³⁸ ABBIENDI	99J OPAL	$e^+e^- \rightarrow Z$
$2 \pm 7 \pm 3$	⁶³⁹ ACKERSTAFF	97∪ OPAL	$e^+e^- \rightarrow Z$
\bullet \bullet \bullet We do not use the followin	ng data for averages	, fits, limits,	etc. • • •
$4 \pm 18 \pm 3$	⁶⁴⁰ BEHRENS	00B CLE2	Repl. by JAFFE 01
< 45	⁶⁴¹ BARTELT	93 CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
⁶³⁴ AUBERT 04C reports $ q/p =$	$1.029 \pm 0.013 \pm 0.023$	L1 and we co	nverted it to $(1 - q/p ^2)/4$.

- ⁶³⁵ AUBERT 02K uses the charge asymmetry in like-sign dilepton events.
- ⁶³⁶ BARATE 01D measured by investigating time-dependent asymmetries in semileptonic and fully inclusive B_d^0 decays.
- 637 JAFFE 01 finds $a_{\ell\ell}=0.013\pm0.050\pm0.005$ and combines with the previous BEHRENS 00B independent measurement.
- 638 Data analyzed using the time-dependent asymmetry of inclusive B^0 decay. The production flavor of B^0 mesons is determined using both the jet charge and the charge of secondary vertex in the opposite hemisphere.
- 639 ACKERSTAFF 97U assumes *CPT* and is based on measuring the charge asymmetry in a sample of B^0 decays defined by lepton and Q_{hem} tags. If *CPT* is not invoked, $\text{Re}(\epsilon_B) = -0.006 \pm 0.010 \pm 0.006$ is found. The indirect *CPT* violation parameter is determined to $\text{Im}(\delta B) = -0.020 \pm 0.016 \pm 0.006$.
- ⁶⁴⁰ BEHRENS 00B uses high-momentum lepton tags and partially reconstructed $\overline{B}^0 \rightarrow D^{*+}\pi^-$, ρ^- decays to determine the flavor of the *B* meson.
- ⁶⁴¹ BARTELT 93 finds $a_{\ell\ell} = 0.031 \pm 0.096 \pm 0.032$ which corresponds to $|a_{\ell\ell}| < 0.18$, which yields the above $|\text{Re}(\epsilon_{B0})/(1+|\epsilon_{B0}|^2|$.

 $A_{T/CP}$ $A_{T/CP}$ is defined as

$$\frac{P(\overline{B}^0 \to B^0) - P(B^0 \to \overline{B}^0)}{P(\overline{B}^0 \to B^0) + P(B^0 \to \overline{B}^0)}$$

the *CPT* invariant asymmetry between the oscillation probabilities $P(\overline{B}^0 \rightarrow B^0)$ and $P(B^0 \rightarrow \overline{B}^0)$.

VALUE	DOCUMENT ID	TECN	COMMENT
$0.005 \pm 0.012 \pm 0.014$	642 AUBERT	02ĸ BABR	$e^+e^- \rightarrow \Upsilon(4S)$

⁶⁴² AUBERT 02K uses the charge asymmetry in like-sign dilepton events.

$$A_{CP} (B^0 \rightarrow K^+ \pi^-)$$

A_{CP} is defined as

$$\frac{B(\overline{B}^0 \to \overline{f}) - B(B^0 \to f)}{B(\overline{B}^0 \to \overline{f}) + B(B^0 \to f)},$$

the *CP*-violation charge asymmetry of exclusive B^0 and \overline{B}^0 decay.

VALUE	DOCUMENT ID	TECN	COMMENT
-0.113 ± 0.020 OUR AVERAG	E		
$-0.133\!\pm\!0.030\!\pm\!0.009$	⁶⁴³ AUBERT,B	04ĸ BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$-0.101\!\pm\!0.025\!\pm\!0.005$	⁶⁴⁴ CHAO	04B BELL	$e^+e^- \rightarrow \Upsilon(4S)$
-0.04 ± 0.16	⁶⁴⁵ CHEN	00 CLE2	$e^+e^- ightarrow ~\Upsilon(4S)$
$\bullet~\bullet~$ We do not use the follow	ing data for average	es, fits, limits	, etc. ● ● ●
$-0.07 \pm 0.08 \pm 0.02$	⁶⁴⁶ AUBERT	02D BABR	Repl. by AUBERT 02Q
$-0.102\!\pm\!0.050\!\pm\!0.016$	⁶⁴⁷ AUBERT	02Q BABR	Repl. by AUBERT, B 04K
$-0.06 \ \pm 0.09 \ +0.01 \\ -0.02$	⁶⁴⁸ CASEY	02 BELL	Repl. by CHAO 04B
$0.044 \substack{+0.186+0.018\\-0.167-0.021}$	⁶⁴⁹ ABE	01ĸ BELL	Repl. by CASEY 02
$-0.19\ \pm 0.10\ \pm 0.03$	⁶⁵⁰ AUBERT	01E BABR	Repl. by AUBERT 02Q
612			

⁶⁴³ Based on a total signal yield of $N(K^-\pi^+) + N(K^+\pi^-) = 1606 \pm 51$ events. ⁶⁴⁴ CHAO 04B reports significance of 3.9 standard deviation for deviation of A_{CP} from zero. ⁶⁴⁵ Corresponds to 90% confidence range $-0.30 < A_{CP} < 0.22$. ⁶⁴⁶ Corresponds to 90% confidence range $-0.21 < A_{CP} < 0.07$. ⁶⁴⁷ Corresponds to 90% confidence range $-0.188 < A_{CP} < -0.016$. ⁶⁴⁸ Corresponds to 90% confidence range $-0.21 < A_{CP} < +0.09$.

 649 Corresponds to 90% confidence range $-0.25 < A_{CP} < 0.37$.

 650 Corresponds to 90% confidence range $-0.35 < A_{CP} < -0.03$.



 $A_{CP}(B^0 \rightarrow K^+ \pi^- \pi^0)$ non-resonant TECN COMMENT 652 CHANG 04 BELL $e^+e^- \rightarrow \Upsilon(4S)$ $0.07 \pm 0.11 \pm 0.01$ 652 Corresponds to 90% confidence range $-0.12 < A^{CP} < 0.26$. $A_{CP}(B^0 \rightarrow K^*(892)^+ \pi^-)$ VALUE TECN COMMENT DOCUMENT ID 0.24 ± 0.17 OUR AVERAGE $0.23\!\pm\!0.18\!+\!0.09\\-0.06$ ⁶⁵³ AUBERT,B 040 BABR $e^+e^- \rightarrow \Upsilon(4S)$ $0.26^{+0.33}_{-0.34}{}^{+0.10}_{-0.08}$ 654 EISENSTEIN 03 CLE2 $e^+e^- \rightarrow \Upsilon(4S)$ ⁶⁵³ Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. 654 Corresponds to 90% confidence range $-0.31 < A_{CP} < 0.78$. $A_{CP}(B^+ \rightarrow \eta K^*(892)^0)$ <u>VALUE</u> <u>DOCUMEN</u>T ID TECN COMMENT 04D BABR $e^+e^- \rightarrow \Upsilon(4S)$ $0.02 \pm 0.11 \pm 0.02$ AUBERT,B $A_{CP}(B^0 \rightarrow K^*(892)^0 \phi)$ DOCUMENT ID TECN COMMENT VALUE 0.05 ± 0.10 OUR AVERAGE 03V BABR $e^+e^- \rightarrow \Upsilon(4S)$ $0.04\!\pm\!0.12\!\pm\!0.02$ AUBERT $0.07 \!\pm\! 0.15 \!+\! 0.05 \!-\! 0.03$ 655 CHEN 03B BELL $e^+e^- \rightarrow \Upsilon(4S)$ • • • We do not use the following data for averages, fits, limits, etc. • • • 656 AUBERT 02E BABR Repl. by AUBERT 03V $0.00\!\pm\!0.27\!\pm\!0.03$ 655 Corresponds to 90% confidence range $-0.18 < A_{CP} < 0.33$. 656 Corresponds to 90% confidence range $-0.44 < A_{CP} < 0.44$. $A_{CP}(B^0 \rightarrow K^*(1430)\gamma)$ VALUE <u>TECN</u><u>COMMENT</u> DOCUMENT ID 040 BABR $e^+e^- \rightarrow \Upsilon(4S)$ $-0.08 \pm 0.15 \pm 0.01$ AUBERT,B $A_{CP}(B^0 \rightarrow D^*(2010)^+ D^-)$ VALUE DOCUMENT ID TECN COMMENT 0.03 ± 0.07 OUR AVERAGE ⁶⁵⁷ AUSHEV $0.07\!\pm\!0.08\!\pm\!0.04$ 04 BELL $e^+e^- \rightarrow \Upsilon(4S)$ AUBERT 03J BABR $e^+e^- \rightarrow \Upsilon(4S)$ $-0.03\pm0.11\pm0.05$ ⁶⁵⁷ Combines results from fully and partially reconstructed $B^0 \rightarrow D^{*\pm} D^{\mp}$ decays. $C_{\pi\pi} (B^0 \rightarrow \pi^+ \pi^-)$

 $C_{\pi\pi}$ is defined as $(1-|\lambda|^2)/(1+|\lambda|^2)$, where the quantity $\lambda = q/p \ \overline{A}_f/A_f$ is a phase convention independent observable quantity for the final state f. For details, see the review on "*CP* Violation" in the Reviews section.

VALUE	DOCUMENT ID	TECN	<u>COMMENT</u>	
-0.50 ± 0.14 OUR AVERAGE				
$-0.58 \pm 0.15 \pm 0.07$ $-0.30 \pm 0.25 \pm 0.04$	⁶⁵⁸ ABE ⁶⁵⁹ AUBERT	04e BELL 02q BABR	$egin{array}{rl} e^+ e^- & ightarrow \Upsilon(4S) \ e^+ e^- & ightarrow \Upsilon(4S) \end{array}$	I

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

$-0.77\pm0.27\pm0.08$	⁶⁶⁰ ABE	03G BELL	Repl. by ABE 04E.
$-0.94^{+0.31}_{-0.25}{\pm}0.09$	⁶⁶⁰ ABE	02м BELL	Repl. by ABE 03G
$-0.25^{+0.45}_{-0.47}\pm0.14$	⁶⁶¹ AUBERT	02D BABR	Repl. by AUBERT 02Q

⁶⁵⁸ABE 04E report $A_{\pi\pi}$ which has opposite sign to the convention used in this quantity $(C_{\pi\pi})$.

 659 Corresponds to 90% confidence range $-0.72 < C_{\pi\pi} < 0.12$.

⁶⁶⁰ Papers report $A_{\pi\pi}$ which has opposite sign to the convention used in this quantity $(C_{\pi\pi})$. We have done the conversion here.

 661 Corresponds to 90% confidence range $-1.0 < \! C_{\! \pi \, \pi} < 0.47.$

$S_{\pi\pi} (B^0 \rightarrow \pi^+\pi^-)$

 $S_{\pi\pi}=2{
m Im}\lambda/(1{+}|\lambda|^2)$, see the note in the $C_{\pi\pi}$ datablock above.

VALUE	DOCUMENT I	D <u>TECN</u> <u>COMMENT</u>	
-0.7 ± 0.5 OUR AVERAGE	Error includes sca	le factor of 2.5.	
$-1.00\!\pm\!0.21\!\pm\!0.07$	⁶⁶² ABE	04E BELL $e^+e^- ightarrow ~ \Upsilon(4S)$	
$0.02\!\pm\!0.34\!\pm\!0.05$	⁶⁶³ AUBERT	02Q BABR $e^+e^- \rightarrow \Upsilon(4S)$	
\bullet \bullet \bullet We do not use the follow	ving data for avera	ges, fits, limits, etc. • • •	
$-1.23{\pm}0.41{+0.08\atop-0.07}$	ABE	03G BELL Repl. by ABE 04E.	

$1.25 \pm 0.41 - 0.07$	ABE	USU DELL	Repl. by ADE 04E.
$-1.21\substack{+0.38 + 0.16 \\ -0.27 - 0.13}$	ABE	02м BELL	Repl. by ABE 03G
$0.03^{+0.52}_{-0.56}\!\pm\!0.11$	⁶⁶⁴ AUBERT	02D BABR	Repl. by AUBERT 02Q

⁶⁶² Rule out the *CP*-conserving case, $C_{\pi\pi} = S_{\pi\pi} = 0$, at the 5.2 sigma level. ⁶⁶³ Corresponds to 90% confidence range $-0.54 < S_{\pi\pi} < 0.58$. ⁶⁶⁴ Corresponds to 90% confidence range $-0.89 < S_{\pi\pi} < 0.85$.

 $C_{
ho\pi} (B^0 \rightarrow
ho^+ \pi^-)$ $\frac{DOCUMENT \ ID}{AUBERT} \quad \begin{array}{c} \underline{TECN} & \underline{COMMENT} \\ 03T & BABR & e^+ e^- \rightarrow & \Upsilon(4S) \end{array}$ VALUE $0.36 \pm 0.18 \pm 0.04$ $S_{\rho\pi} (B^0 \rightarrow \rho^+ \pi^-)$ VALUE $\frac{DOCUMENT \ ID}{AUBERT} \quad \begin{array}{c} \underline{TECN} & \underline{COMMENT} \\ 03T \ BABR & e^+ e^- \rightarrow \ \Upsilon(4S) \end{array}$ $0.19 \pm 0.24 \pm 0.03$ $\Delta C_{\rho\pi} (B^0 \rightarrow \rho^+ \pi^-)$ $\Delta C_{\rho\pi}$ describes the asymmetry between the rates $\Gamma(B^0 \rightarrow \rho^+ \pi^-) + \Gamma(\overline{B}^0 \rightarrow \rho^+ \pi^-)$ $\rho^-\pi^+$) and $\Gamma(B^0 \rightarrow \rho^-\pi^+) + \Gamma(\overline{B}{}^0 \rightarrow \rho^+\pi^-)$. DOCUMENT ID TECN COMMENT VALUE AUBERT 03T BABR $e^+e^- \rightarrow \Upsilon(4S)$ $0.28^{+0.18}_{-0.19}\pm0.04$ $\Delta S_{\rho\pi} (B^0 \to \rho^+ \pi^-) \\ \Delta S_{\rho\pi} \text{ is related to the strong phase difference between the amplitudes contributing}$ to $B^0 \rightarrow \rho^+ \pi^-$.

VALUEDOCUMENT IDTECNCOMMENT
$$0.15 \pm 0.25 \pm 0.03$$
AUBERT03TBABR $e^+ e^- \rightarrow \Upsilon(4S)$ HTTP://PDG.LBL.GOVPage 89Created: $6/24/2005$ 17:16

 $C_{\rho\rho} (B^0 \rightarrow \rho^+ \rho^-)$ $\frac{DOCUMENT \ ID}{AUBERT,B} \quad \begin{array}{c} \underline{TECN} & \underline{COMMENT} \\ \mathbf{04R} & BABR & e^+ e^- \rightarrow & \Upsilon(4S) \end{array}$ $-0.17\pm0.27\pm0.14$ $S_{\rho\rho} \left(B^0 \rightarrow \ \rho^+ \rho^-
ight)$ VALUE $\frac{DOCUMENT \ ID}{AUBERT,B} \quad \begin{array}{c} \underline{TECN} & \underline{COMMENT} \\ 04R & BABR & e^+ e^- \rightarrow & \Upsilon(4S) \end{array}$ $-0.42\pm0.42\pm0.14$ $C_{K^*(892)^0\gamma} (B^0 \to K^*(892)^0\gamma)$ $\frac{DOCUMENT ID}{665} \frac{TECN}{AUBERT,B} \quad 04Z \text{ BABR } e^+e^- \rightarrow \Upsilon(4S)$ VALUE $-0.57 \pm 0.32 \pm 0.09$ 665 Based on a total signal of 105 \pm 14 events with $K^*(892)^0 \rightarrow K^0_S \pi^0$ only. $S_{K^*(892)^0\gamma} (B^0 \to K^*(892)^0\gamma)$ $\frac{DOCUMENT ID}{666} \frac{TECN}{AUBERT,B} 04Z BABR e^+e^- \rightarrow \Upsilon(4S)$ VALUE $0.25 \pm 0.63 \pm 0.14$ 666 Based on a total signal of 105 \pm 14 events with $K^*(892)^0 \rightarrow K^0_{c} \pi^0$ only. $C_{K^0_S\pi^0} \ (B^0 \rightarrow \ K^0_S\pi^0)$ DOCUMENT ID TECN COMMENT 0.40^{+0.27}±0.09 ⁶⁶⁷ AUBERT,B 04M BABR $e^+e^- \rightarrow \Upsilon(4S)$ • • We do not use the following data for averages, fits, limits, etc. • • • 668 AUBERT 04M BABR Repl. by $-0.03\!\pm\!0.36\!\pm\!0.11$ AUBERT, B 04M ⁶⁶⁷ Based on a total signal yield of 122 ± 16 events. ⁶⁶⁸ AUBERT 04M reported $A_{CP}(B^0 \rightarrow \kappa^0 \pi^0) = 0.03 \pm 0.36 \pm 0.11$ which equals $-C_{\kappa_s^0 \pi^0}$. $S_{K_{S}^{0}\pi^{0}} (B^{0} \rightarrow K_{S}^{0}\pi^{0})$ <u>VALUE</u> DOCUMENT ID TECN COMMENT $0 \text{ AR} + 0.38 \pm 0.06$ DOCUMENT ID TECN COMMENT $e^{+}e^{-} \rightarrow \Upsilon(4S)$ 669 Based on a total signal yield of 122 \pm 16 events. $C_{\eta'(958)K} (B^0 \rightarrow \eta'(958)K_S^0)$ DOCUMENT ID TECN COMMENT VALUE 0.04 ± 0.13 OUR AVERAGE ⁶⁷⁰ ABE 03H BELL $e^+e^- \rightarrow \Upsilon(4S)$ $0.01\!\pm\!0.16\!\pm\!0.04$ 03W BABR $e^+e^- \rightarrow \Upsilon(4S)$ AUBERT $0.10 \pm 0.22 \pm 0.04$ • • • We do not use the following data for averages, fits, limits, etc. • • • ⁶⁷⁰ ABE $-0.26 \pm 0.22 \pm 0.03$ 03C BELL Repl. by ABE 03H $-0.13 \pm 0.32 \substack{+0.06 \\ -0.09}$ 670 CHEN 02B BELL Repl. by ABE 03C ⁶⁷⁰ BELLE Collab. quotes $A_{\eta'(958)} \kappa_c^0$ which is equal to $-C_{\eta'(958)} \kappa_s^0$.

Citation: S. Eidelman et al. (Particle Data Group), Phys. Lett. B 592, 1 (2004) and 2005 partial update for edition 2006 (URL: http://pdg.lbl.gov)

 $S_{\eta'(958)K} (B^0 \rightarrow \eta'(958)K_S^0)$ DOCUMENT ID TECN COMMENT 0.27 ± 0.21 OUR AVERAGE 03H BELL $e^+e^- \rightarrow \Upsilon(4S)$ $0.43 \!\pm\! 0.27 \!\pm\! 0.05$ ABE 03W BABR $e^+e^- \rightarrow \Upsilon(4S)$ $0.02\!\pm\!0.34\!\pm\!0.03$ AUBERT • • We do not use the following data for averages, fits, limits, etc. • • • $0.71 \pm 0.37 \substack{+0.05 \\ -0.06}$ ABE 03C BELL Repl. by ABE 03H $0.28 \pm 0.55 \substack{+0.07 \\ -0.08}$ 02B BELL Repl. by ABE 03C CHEN $C_{\phi K_c^0} (B^0 \rightarrow \phi K_S^0)$ DOCUMENT ID TECN COMMENT 0.09 ± 0.23 OUR AVERAGE ⁶⁷¹ AUBERT,B 04G BABR $e^+e^- \rightarrow \Upsilon(4S)$ $0.01\!\pm\!0.33\!\pm\!0.10$ 672 ABE 03H BELL $e^+e^- \rightarrow \Upsilon(4S)$ $0.15\!\pm\!0.29\!\pm\!0.07$ • • • We do not use the following data for averages, fits, limits, etc. • • • 672 ABE 03C BELL Repl. by ABE 03H $0.56\!\pm\!0.41\!\pm\!0.16$ ⁶⁷¹ Measurement combines B-meson final states ϕK_{S}^{0} and ϕK_{I}^{0} by assuming $S_{\phi K_{S}^{0}} = -S_{\phi K_{L}^{0}}$ ⁶⁷² BELLE Collab. quotes $A_{\phi K_{S}^{0}}$ which is equal to $-C_{\phi K_{S}^{0}}$. $S_{\phi K_c^0} (B^0 \rightarrow \phi K_S^0)$ DOCUMENT ID TECN COMMENT 0.0 ±0.7 OUR AVERAGE Error includes scale factor of 2.3. $0.47 \pm 0.34 \substack{+0.08 \\ -0.06}$ ⁶⁷³ AUBERT,B 04G BABR $e^+e^- \rightarrow \Upsilon(4S)$ $-0.96\!\pm\!0.50\!+\!0.09\\-0.11$ 03H BELL $e^+e^- \rightarrow \Upsilon(4S)$ ABE • • We do not use the following data for averages, fits, limits, etc. • • • $-0.73 \!\pm\! 0.64 \!\pm\! 0.22$ ABE 03C BELL Repl. by ABE 03H ⁶⁷³ Measurement combines B-meson final states ϕK_{S}^{0} and ϕK_{I}^{0} by assuming $S_{\phi K_{c}^{0}} = -S_{\phi K_{c}^{0}}$ $C_{K^+K^-K^0_S} (B^0 \rightarrow K^+K^-K^0_S)$ DOCUMENT ID TECN COMMENT 0.07±0.13 OUR AVERAGE 674 AUBERT,B 04 V BABR $e^+e^- \rightarrow \Upsilon(4S)$ $-0.10\!\pm\!0.19\!\pm\!0.10$ 675,676 ABE 03H BELL $e^+e^- \rightarrow \Upsilon(4S)$ $0.17\!\pm\!0.16\!\pm\!0.04$ • • We do not use the following data for averages, fits, limits, etc. • • • $0.40 \pm 0.33 \substack{+0.28 \\ -0.10}$ 675 ABF 03C BELL Repl. by ABE 03H $^{674}\,{\rm Excludes}$ the events from $B^0 \to \ \phi \, {\cal K}^0_S$ decay. The measured CP-even final states fraction is 0.98 \pm 0.15 \pm 0.04. 675 BELLE Collab. quotes $A_{K^+K^-K_S^0}$ which is equal to $-C_{K^+K^-K_S^0}$. 676 Excludes the events from $B^0 \rightarrow \phi K^0_S$ decay. The measured *CP*-even final states fraction is 1.03 \pm 0.15 \pm 0.05. HTTP://PDG.LBL.GOV Created: 6/24/2005 17:16 Page 91

 $S_{K^+K^-K_c^0}(B^0 \to K^+K^-K_s^0)$ TECN COMMENT DOCUMENT ID -0.54 ± 0.18 OUR AVERAGE 677 AUBERT,B 04V BABR $e^+e^- \rightarrow \Upsilon(4S)$ $-0.56 \pm 0.25 \pm 0.04$ ⁶⁷⁸ ABE 03H BELL $e^+e^- \rightarrow \Upsilon(4S)$ $-0.51\!\pm\!0.26\!\pm\!0.05$ • • • We do not use the following data for averages, fits, limits, etc. • • • $-0.49 \pm 0.43 \pm 0.11$ ABE 03C BELL Repl. by ABE 03H 677 Excludes the events from $B^0 o \phi \kappa^0_S$ decay. The measured *CP*-even final states fraction is 0.98 \pm 0.15 \pm 0.04. 678 Excludes the events from $B^0 o \ \phi \ \kappa_S^0$ decay. The measured *CP*-even final states fraction is 1.03 \pm 0.15 \pm 0.05. $C_{D^*(2010)^- D^+} (B^0 \rightarrow D^*(2010)^- D^+)$ DOCUMENT ID <u>TECN</u> COMMENT VALUE 0.09 ± 0.21 OUR AVERAGE 679 AUSHEV 04 BELL $e^+e^- \rightarrow \Upsilon(4S)$ $0.23\!\pm\!0.25\!\pm\!0.06$ 03J BABR $e^+e^- \rightarrow \Upsilon(4S)$ AUBERT $-0.22\!\pm\!0.37\!\pm\!0.10$ 679 Combines results from fully and partially reconstructed $B^0 \rightarrow D^{*\pm} D^{\mp}$ decays. $S_{D^*(2010)^-D^+} (B^0 \rightarrow D^*(2010)^-D^+)$ VALUE DOCUMENT ID TECN COMMENT -0.8 ± 0.4 OUR AVERAGE 680 AUSHEV 04 BELL $e^+e^- \rightarrow \Upsilon(4S)$ $-0.96 \pm 0.43 \pm 0.12$ 03J BABR $e^+e^- \rightarrow \Upsilon(4S)$ AUBERT $-0.24 \pm 0.69 \pm 0.12$ ⁶⁸⁰ Combines results from fully and partially reconstructed $B^0 \rightarrow D^{*\pm} D^{\mp}$ decays. $C_{D^*(2010)^+D^-} (B^0 \rightarrow D^*(2010)^+D^-)$ TECN COMMENT VALUE DOCUMENT ID -0.39 ± 0.20 OUR AVERAGE 681 AUSHEV $-0.37 \pm 0.22 \pm 0.06$ 04 BELL $e^+e^- \rightarrow \Upsilon(4S)$ AUBERT 03J BABR $e^+e^- \rightarrow \Upsilon(4S)$ $-0.47 \pm 0.40 \pm 0.12$ ⁶⁸¹Combines results from fully and partially reconstructed $B^0 \rightarrow D^{*\pm}D^{\mp}$ decays. $S_{D^*(2010)^+D^-} (B^0 \rightarrow D^*(2010)^+D^-)$ VALUE DOCUMENT ID TECN COMMENT -0.6 ± 0.4 OUR AVERAGE 682 AUSHEV $-0.55 \pm 0.39 \pm 0.12$ 04 BELL $e^+e^- \rightarrow \Upsilon(4S)$ 03J BABR $e^+e^- \rightarrow \Upsilon(4S)$ AUBERT $-0.82\!\pm\!0.75\!\pm\!0.14$ ⁶⁸² Combines results from fully and partially reconstructed $B^0 \rightarrow D^{*\pm} D^{\mp}$ decays. $C_{J/\psi(1S)\pi^0} (B^0 \to J/\psi(1S)\pi^0)$ DOCUMENT ID TECN COMMENT VALUE 0.13 ± 0.24 OUR AVERAGE ⁶⁸³ KATAOKA 04 BELL $e^+e^- \rightarrow \Upsilon(4S)$ $0.01\!\pm\!0.29\!\pm\!0.03$ 03N BABR $e^+e^- \rightarrow \Upsilon(4S)$ AUBERT $0.38 \!\pm\! 0.41 \!\pm\! 0.09$ ⁶⁸³ BELLE Collab. quotes $A_{J/\psi \pi^0}$ which is equal to $-C_{J/\psi \pi^0}$.

$S_{J/\psi(1S)\pi^0} (B^0 \to J/\psi(1S)\pi^0)$							
VALUE	DOCUMENT ID	TECN COMMENT					
-0.4 ± 0.4 OUR AVERAGE	Error includes scale	factor of 1.1.	_				
$-0.72 \pm 0.42 \pm 0.09$	KATAOKA	04 BELL $e^+e^- ightarrow \Upsilon(4S)$					
$0.05\!\pm\!0.49\!\pm\!0.16$	AUBERT	O3N BABR $e^+e^- ightarrow ~\Upsilon(4S)$					

 $|\lambda| (B^0 \rightarrow c \overline{c} K^0)$ The same λ quantity, defined in the $C_{\pi \pi}$ datablock above.

"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 corrections between the measurements.

VALUE	DOCUMENT ID	TECN	COMMENT
0.969 ± 0.028 OUR EVALUATIO	Ν		
0.967±0.028 OUR AVERAGE			
$1.007\!\pm\!0.041\!\pm\!0.033$	⁶⁸⁴ ABE	05b BELL	$e^+e^- \rightarrow \Upsilon(4S)$
$0.950 \!\pm\! 0.031 \!\pm\! 0.013$	⁶⁸⁵ AUBERT	05F BABR	$e^+e^- ightarrow ~\Upsilon(4S)$
\bullet \bullet \bullet We do not use the followin	ng data for averages	s, fits, limits,	etc. • • •
$\begin{array}{c} 0.950 \pm 0.049 \pm 0.025 \\ 0.948 \pm 0.051 \pm 0.030 \end{array}$	⁶⁸⁶ ABE ⁶⁸⁷ AUBERT	02z BELL 02P BABR	Repl. by ABE 05B Repl. by AUBERT 05F
684 Measurement based on 152 > 685 Measurement based on 227 > 686 Measured with both $\eta_f=\pm$	< 10 ⁶ BB pairs. < 10 ⁶ BB pairs. 1 samples.		

 687 Measured with the high purity of $\eta_f=-1$ samples.

 $|\lambda|$ ($B^0 \rightarrow D^{*+}D^{*-}$) The same λ quantity, defined in the $C_{\pi\pi}$ datablock above, but in C-even final state.

VALUE	DOCUMENT ID	TECN	COMMENT
0.75±0.19±0.02	AUBERT (03Q BABR	$e^+e^- \rightarrow \Upsilon(4S)$

$Im(\lambda) (B^0 \rightarrow D^{*+}D^{*-})$

The same λ quantity, defined in the $\mathcal{C}_{\pi\,\pi}$ datablock above, but in \mathcal{C} -even final state.

VALUE		DOCUMENT ID		TECN	COMMENT	
$0.05 {\pm} 0.29 {\pm} 0.10$		AUBERT	03Q	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$ \lambda (B^0 \rightarrow J/\psi K^*)$	92) ⁰)					
VALUE	<u>CL%</u>	DOCUMENT ID		TECN	COMMENT	
<0.25	95 688	³ AUBERT,B	04н	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$^{688}\rm{Uses}$ the measured co	sine coeffic	ients C and \overline{C} a	nd as	sumes	$\left q/p \right = 1.$	

HTTP://PDG.LBL.GOV

 $(S_+ + S_-)/2 (B^0 \rightarrow D^{*-} \pi^+)$ $S_{\pm} = - \frac{2Im(\lambda_{\pm})}{1+|\lambda_{+}|^2}$ where λ_{+} and λ_{-} are defined in the $C_{\pi\pi}$ datablock above for $B^0 \rightarrow D^{*-}\pi^+$ and $B^0 \rightarrow D^{*+}\pi^-$. VALUE DOCUMENT ID TECN COMMENT -0.04 ± 0.04 OUR AVERAGE Error includes scale factor of 1.8. See the ideogram below. ⁶⁸⁹ AUBERT 04V BABR $e^+e^- \rightarrow \Upsilon(4S)$ $-0.068 \pm 0.038 \pm 0.020$ ⁶⁹⁰ AUBERT 04W BABR $e^+e^- \rightarrow \Upsilon(4S)$ $-0.063 \pm 0.024 \pm 0.014$ ⁶⁸⁹ SARANGI 04 BELL $e^+e^- \rightarrow \Upsilon(4S)$ $0.060 \pm 0.040 \pm 0.019$ ⁶⁸⁹ Uses fully reconstructed $B^0 \rightarrow D^{*\pm} \pi^{\mp}$ decays. ⁶⁹⁰ Uses partially reconstructed $B^0 \rightarrow D^{*\pm} \pi^{\mp}$ decays. WEIGHTED AVERAGE -0.04±0.04 (Error scaled by 1.8) 04V BABR AUBERT 0.504W BABR AUBERT 0.9 SARANGI 04 BELL 4.8 6.2 (Confidence Level = 0.045) -0.2 -0.1 0 0.1 0.2 0.3 $(S_{+} + S_{-})/2 (B^{0} \rightarrow D^{*-} \pi^{+})$ $(S_{-} - S_{+})/2 (B^{0} \rightarrow D^{*-}\pi^{+})$ VALUE DOCUMENT ID TECN COMMENT 0.021 ± 0.028 OUR AVERAGE ⁶⁹¹ AUBERT 04 V BABR $e^+e^- \rightarrow \Upsilon(4S)$ $0.031 \!\pm\! 0.070 \!\pm\! 0.033$ ⁶⁹² AUBERT 04W BABR $e^+e^- \rightarrow \Upsilon(4S)$ $-0.004 \pm 0.037 \pm 0.014$ ⁶⁹¹ SARANGI 04 BELL $e^+e^- \rightarrow \Upsilon(4S)$ $0.049 \!\pm\! 0.040 \!\pm\! 0.019$ ⁶⁹¹ Uses fully reconstructed $B^0 \rightarrow D^{*\pm} \pi^{\mp}$ decays. ⁶⁹² Uses partially reconstructed $B^0 \rightarrow D^{*\pm} \pi^{\mp}$ decays.

$(S_{+} + S_{-})/2 (B^{0} \rightarrow D^{-}\pi^{+})$						
VALUE	DOCUMENT ID		TECN	<u>COMMENT</u>		
-0.043 ± 0.030 OUR AVERAGE						
$-0.022\!\pm\!0.038\!\pm\!0.020$	⁶⁹³ AUBERT	04V	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$	
$-0.062\!\pm\!0.037\!\pm\!0.018$	⁶⁹³ SARANGI	04	BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$	
$^{693}\rm Uses$ fully reconstructed B^0	$\rightarrow D^{\pm}\pi^{\mp}$ decays.					
$(S_{-} - S_{+})/2 (B^{0} \rightarrow D^{-})$	π ⁺)					
VALUE	DOCUMENT ID		TECN	<u>COMMENT</u>		
-0.01 ± 0.04 OUR AVERAGE						
$0.025\!\pm\!0.068\!\pm\!0.033$	⁶⁹⁴ AUBERT	04V	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$	
$-0.025\!\pm\!0.037\!\pm\!0.018$	⁶⁹⁴ SARANGI	04	BELL	$e^+e^- \rightarrow$	$\Upsilon(4S)$	
694 Uses fully reconstructed B^0	$\rightarrow D^{\pm}\pi^{\mp}$ decays.					

$sin(2\beta)$

For a discussion of CP violation, see the review on "CP Violation" in the Reviews section. $sin(2\beta)$ is a measure of the *CP*-violating amplitude in the $B_d^0 \rightarrow J/\psi(1S) K_S^0$.

"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 corrections between the measurements. DOCUMENT ID TECN COMMENT

VALUE	DOCUMENT ID	TECN	COMMENT
0.725 ± 0.037 OUR EVALUATIO	N		
0.73 \pm 0.04 OUR AVERAGE			
$0.728\!\pm\!0.056\!\pm\!0.023$	⁶⁹⁵ ABE	05b BELL	$e^+e^- ightarrow ~\Upsilon(4S)$
$0.722\!\pm\!0.040\!\pm\!0.023$	⁶⁹⁶ AUBERT	05F BABR	$e^+e^- ightarrow ~\Upsilon(4S)$
$1.56\ \pm 0.42\ \pm 0.21$	⁶⁹⁷ AUBERT	04r BABR	$e^+e^- ightarrow ~\Upsilon(4S)$
$0.79 \begin{array}{c} +0.41 \\ -0.44 \end{array}$	⁶⁹⁸ AFFOLDER	00c CDF	<i>рр</i> ат 1.8 ТеV
$\begin{array}{ccc} 0.84 & +0.82 \\ -1.04 & \pm 0.16 \end{array}$	⁶⁹⁹ BARATE	00Q ALEP	$e^+e^- \rightarrow Z$
$\begin{array}{rrr} 3.2 & +1.8 \\ -2.0 & \pm 0.5 \end{array}$	⁷⁰⁰ ACKERSTAFF	98z OPAL	$e^+e^- \rightarrow Z$
\bullet \bullet \bullet We do not use the followi	ng data for averages	, fits, limits,	etc. ● ● ●
$0.99 \ \pm 0.14 \ \pm 0.06$	⁷⁰¹ ABE	02∪ BELL	$e^+e^- \rightarrow \Upsilon(4S)$
$0.719\!\pm\!0.074\!\pm\!0.035$	⁷⁰² ABE	02z BELL	Repl. by ABE 05B
$0.59 \ \pm 0.14 \ \pm 0.05$	⁷⁰³ AUBERT	02N BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$0.741 \!\pm\! 0.067 \!\pm\! 0.034$	⁷⁰⁴ AUBERT	02P BABR	Repl. by AUBERT 05F
$\begin{array}{rrrr} 0.58 & +0.32 & +0.09 \\ & -0.34 & -0.10 \end{array}$	ABASHIAN	01 BELL	Repl. by ABE 01G
$0.99 \ \pm 0.14 \ \pm 0.06$	⁷⁰⁵ ABE	01G BELL	Repl by ABE 02Z
$0.34 \pm 0.20 \pm 0.05$	AUBERT	01 BABR	Repl. by AUBERT 01B
$0.59\ \pm 0.14\ \pm 0.05$	⁷⁰⁵ AUBERT	01B BABR	Repl. by AUBERT 02P
$1.8 \pm 1.1 \pm 0.3$	^{/U0} ABE	980 CDF	Repl. by AF- FOLDER 00C

 695 Measurement based on $152\times10^6~B\overline{B}$ pairs. 696 Measurement based on $227\times10^6~B\overline{B}$ pairs.

 $^{697}\,\mathrm{Measurement}$ in which the J/ψ decays to hadrons or to muons that do not satisfy the standard identification criteria.

 698 AFFOLDER 00C uses about 400 $B^0 \rightarrow J/\psi(1S) \kappa_S^0$ events. The production flavor of B^0 was determined using three tagging algorithms: a same-side tag, a jet-charge tag, and a soft-lepton tag.

⁶⁹⁹ BARATE 00Q uses 23 candidates for $B^0 \rightarrow J/\psi(1S) \kappa_S^0$ decays. A combination of jet-charge, vertex-charge, and same-side tagging techniques were used to determine the B^0 production flavor.

 700 ACKERSTAFF 98Z uses 24 candidates for $B^0_d o J/\psi(1S) \kappa^0_S$ decay. A combination of jet-charge and vertex-charge techniques were used to tag the B_d^0 production flavor.

 $^{701}\,\mathrm{ABE}$ 02U result is based on the same analysis and data sample reported in ABE 01G.

- ⁷⁰² ABE 02Z result is based on $85 \times 10^6 \ B\overline{B}$ pairs.
- 703 AUBERT 02N result based on the same analysis and data sample reported in AUBERT 01B. 704 AUBERT 02P result is based on $88 \times 10^6 \ B\overline{B}$ pairs.

 $^{705}\,\rm{First}$ observation of CP violation in B^0 meson system.

⁷⁰⁶ ABE 98U uses 198 \pm 17 $B_d^0 \rightarrow J/\psi(1S) K^0$ events. The production flavor of B^0 was determined using the same side tagging technique.

$|\sin(2\beta + \gamma)|$

 $\dot{\beta}~(\phi_1)$ and $\gamma~(\phi_3)$ are angles of CKM unitarity triangle, see the review on "CP Violation" in the Reviews section.

VALUE	CL%	<u>DOCUMENT ID</u>		TECN	<u>COMMENT</u>	
>0.58	95	707 AUBERT	04W	BABR	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\bullet \bullet \bullet$ We do not use the	e follow	ing data for averages	s, fits	, limits,	etc. • • •	
		700				

⁷⁰⁸ AUBERT 04V BABR $e^+e^- \rightarrow \Upsilon(4S)$ >0.69 68

 707 Combining this measurement with the results from AUBERT 04V for fully reconstructed $B^0 \rightarrow D^{(*)\pm}\pi^{\mp}$ and some theoretical assumptions, such as the SU(3) symmetry relation. 708 Uses fully reconstructed $B^0 o D^{(*)\pm}\pi^{\mp}$ decays and some theoretical assumptions,

such as the SU(3) symmetry relation.

$\boldsymbol{\alpha}$

For angle $\alpha(\phi_2)$ of the CKM unitarity triangle, see the review on "CP violation" in the reviews section.

VALUE (°)	DOCUMENT ID	TECN	COMMENT
$102_{-12}^{+16}\pm 14$	709 AUBERT,B	04R BABR	$e^+e^- \rightarrow \Upsilon(4S)$

 709 Obtained from the measured *CP* parameters of the longitudinal polarization by selecting the solution closest to the CKM best fit central value of $\alpha = 95^{\circ} - 98^{\circ}$.

$B^0 \rightarrow D^{*-} \ell^+ \nu_{\ell}$ FORM FACTORS

R_1 (form factor ratio \sim	V/A_1)				
VALUE	DOCUMENT ID		TECN	COMMENT	
$1.18 \pm 0.30 \pm 0.12$	DUBOSCQ	96	CLE2	$e^+e^- ightarrow ~\Upsilon(4S)$	
$\it R_2$ (form factor ratio \sim	$A_2/A_1)$				
VALUE	DOCUMENT ID		TECN	COMMENT	
$0.71 \pm 0.22 \pm 0.07$	DUBOSCQ	96	CLE2	$e^+e^- ightarrow ~\Upsilon(4S)$	
$ ho_{oldsymbol{A}_1}^2$ (form factor slope)					
VALUE	DOCUMENT ID		TECN	COMMENT	
$0.91 \pm 0.15 \pm 0.06$	DUBOSCQ	96	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$	

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ABAZOV	05C	PRL 94 102001	V.M. Abazov <i>et al.</i>	(D0 Collab.)
ABAZOV	05D	PRL 94 182001	V.M. Abazov <i>et al.</i>	(D0 Collab.)
ABE	05B	PR D/1 0/2003	K. Abe <i>et al.</i>	(BELLE Collab.)
Also	05C	PR D/1 0/9903(Erratum	K. Abe et al.	(BELLE Collab.)
ALIBERT	05	PRL 94 101005 PRI 04 011801	D. Acosta et al. B. Aubor et al.	(CDF Collab.)
AUBERT	05 05E	PR D71 051502R	B. Aubert et al	(BABAR Collab.)
AUBERT	05E	PRI 94 161803	B Aubert et al	(BABAR Collab.)
ABDALLAH	04D	EPJ C33 213	J. Abdallah <i>et al.</i>	(DELPHI Collab.)
ABDALLAH	04E	EPJ C33 307	J. Abdallah <i>et al.</i>	(DELPHI Collab.)
ABE	04E	PRL 93 021601	K. Abe <i>et al.</i>	(BELLE Collab.)
ACOSTA	04D	PRL 93 032001	D. Acosta <i>et al.</i>	(CDF Collab.)
AUBERT	04A	PR D69 011102	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	04B	PR D69 032004	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	04C	PRL 92 111801	B. Aubert <i>et al.</i>	(BaBar Collab.)
AUBERT	04G	PR D69 031102R	B. Aubert <i>et al.</i>	(BABAR Collab.)
	0411	PRL 92 001801	B. Aubert et al.	(BABAR Collab.)
AUBERT	041VI	PR D60 052001	B. Aubert et al.	(BABAR Collab.)
AUBERT	0411	PR D69 091503R	B Aubert et al	(BABAR Collab.)
AUBERT	04V	PRL 92 251801	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	04W	PRL 92 251802	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 011101R	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,B	04C	PR D70 012007	B. Aubert <i>et al.</i>	(BABAR Collab.)
Also	04L	PRL 92 181801	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,B	04D	PR D70 032006	B. Aubert <i>et al.</i>	(BABAR Collab.)
	04G	PRL 93 0/1801	B. Aubert et al.	(BABAR Collab.)
AUDERT,D	04 1	PRL 93 001001 PRI 03 001802	B. Aubert et al.	(BABAR Collab.)
AUBERT B	04J 04K	PRI 93 131801	B. Aubert et al	(BABAR Collab.)
AUBERT.B	04M	PRL 93 131805	B. Aubert	(BABAR Collab.)
AUBERT,B	040	PR D70 091103R	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,B	04R	PRL 93 231801	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,B	04S	PRL 93 181801	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,B	04T	PR D70 091104R	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,B	04U	PR D70 091105R	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,B	04V	PRL 93 181805	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUDERT,D	04VV 04X	PRL 95 251004 PRI 03 181806	B. Aubert et al.	(BABAR Collab)
AUBERT B	047	PRI 93 201801	B Aubert et al	(BABAR Collab.)
AUBERT.BE	04	PR D70 111102R	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.)
AUSHEV	04	PRL 93 201802	T. Aushev <i>et al.</i>	(BELLE Collab.)
BORNHEIM	04	PRL 93 241802	A. Bornheim <i>et al.</i>	(CLEO Collab.)
CHANG	04	PL B599 148	P. Chang <i>et al.</i>	(BELLE Collab.)
CHAO	04	PR D69 111102R	Y. Chao et al.	(BELLE Collab.)
	04B	PRL 93 191802	Y. Chao <i>et al.</i>	(BELLE Collab.)
	04	PRI 02 051801	A Drutskov et al	(BELLE Collab.)
GARMASH	04	PR D69 012001	A Garmash et al	(BELLE Collab.)
KATAOKA	04	PRL 93 261801	S.U. Kataoka <i>et al.</i>	(BELLE Collab.)
MAJUMDER	04	PR D70 111103R	G. Majumder <i>et al.</i>	(BELLE Collab.)
NAKAO	04	PR D69 112001	M. Nakao <i>et al.</i>	(BELLE Collab.)
SARANGI	04	PRL 93 031802	T.R. Sarangi <i>et al.</i>	(BELLE Collab.)
WANG	04	PRL 92 131801	M.Z. Wang <i>et al.</i>	(BELLE Collab.)
WANG	04A	PK D70 012001	C.H. Wang <i>et al.</i>	(BELLE Collab.)
	03B	EFJ (20 155 DD D67 020002	J. Abdallan <i>et al.</i>	(DELPHI Collab.)
	03D	FR D07 032003 PR D67 031102P	r. Aue el al. K Abe et al	(DELLE COND.)
ABE	03G	PR D68 012001	K. Abe <i>et al.</i>	(BELLE Collab.)
ABE	03H	PRL 91 261602	K. Abe <i>et al.</i>	(BELLE Collab.)
ADAM	03	PR D67 032001	N.E. Adam <i>et al.</i>	(CLEO Collab.)
ATHAR	03	PR D68 072003	S.B. Athar <i>et al.</i>	(CLEO Collab.)
AUBERT	03B	PRL 90 091801	B. Aubert <i>et al.</i>	(BaBar Collab.)
AUBERT	03C	PR D67 072002	B. Aubert <i>et al.</i>	(BaBar Collab.)

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ALIDEDT	02D	DDI 00 101002	P Aubort of a	.1	(PaPar	Callah)
AUDERT	030	FRE 90 101003	B. Aubert et a	<i>.</i>	(DaDar	Collab.)
AUBERT	03E	PRL 90 181801	B. Aubert et a	d.	(BaBar	Collab.)
AUBERT	03H	PR D67 091101R	B Aubert et a		(BaBar	Collab)
AUDEDT	0011			1		
AUBERT	031	PR D67 092003	B. Aubert <i>et a</i>	1.	(BaBar	Collab.)
AUBERT	03J	PRL 90 221801	B. Aubert et a	<i>.</i>	(BaBar	Collab.)
ALIDEDT	0.21/	DDL 00 021901	P Aubout of a	.1	(De Der	Callah
AUDERI	05N	PRL 90 231001	D. Aubert et a	<i></i>	(DaDar	Collab.)
AUBERT	03L	PRL 91 021801	B. Aubert et a	d.	(BaBar	Collab.)
ALIDEDT	0211	DDI 01 061902	P Aubort of a	.1	(PaPar	Callah
AUBLET	0.514	FRL 91 001002	B. Aubert et a		(DaDar	Collab.)
AUBERT	030	PRL 91 071801	B. Aubert et a	d.	(BaBar	Collab.)
ALIBERT	030	DDI 01 131901	R Aubort at a	1	(BaBar	Collab Ì
AUBLICT	050	TICE 91 131001	D. Aubert et a	1.	(DaDai	Collab.)
AUBERT	035	PRL 91 241801	B. Aubert et a	1.	(BaBar	Collab.)
ALIBERT	03T	PRI 01 201802	R Aubert et a	1	(BaBar	Collab Ì
NODERT	0.51	TRE 51 201002	D. Mubert et a	1.		Collab.)
AUBERT	030	PRL 91 221802	B. Aubert et a	1.	(BaBar	Collab.)
ALIBERT	031/	PRI 01 171802	R Aubert et a	1	(BaBar	Collab Ì
AUDENT	0.5 V	FRE 91 1/1002	D. Aubert et a	1.		Collab.)
AUBERT	0300	PRL 91 161801	B. Aubert et a	<i>I.</i>	(BaBar	Collab.)
ALIBERT	03X	PR D68 092001	R Aubert et a	1	(RaBar	Collah
DODENT	05/	FR D00 052001		1.		Collab.)
BORNHEIM	03	PR D68 052002	A. Bornheim ei	t al.	(CLEO	Collab.)
CHANG	03	PR D68 111101R	M-C Change	t əl	(RELLE	Collah
CHINING	00				OFFE	Collab.)
CHEN	03B	PRL 91 201801	KF. Chen <i>et</i>	al.	(BELLE	Collab.)
CSORNA	03	PR D67 112002	S.F. Csorna et	al	(CLEO	Collah
EIGENIGTEIN	00	DD DC0 017101			(CLEO	
EISENSTEIN	03	PR D68 01/101	B.I. Eisenstein	et al.	(CLEO	Collab.)
FANG	03	PRI 90 071801	F Fangetal		(BELLE	Collab)
	00	DDL 00 101000				
GABISHEV	03	PRL 90 121802	N. Gabysnev et	t al.	(BELLE	Collab.)
HASTINGS	03	PR D67 052004	N.C. Hastings	et al.	(BELLE	Collab.)
	00		A 1 1 1	1		
ISHIKAWA	03	PRL 91 261601	A. Ishikawa <i>et</i>	al.	(RELLE	Collab.)
KROKOVNY	03	PRL 90 141802	P. Krokovny et	al.	(BELLE	Collab.)
KDOKOVAN	020	DDL 01 060000	D Kushaway at	-1		Callah
KRUKUVNY	03B	PRL 91 202002	P. Krokovny et	al.	(BELLE	Collab.)
LEE	03	PRL 91 261801	S.H. Lee et al.		(BELLE	Collab.)
	02		A Constant	-1		Callah
SAIPAIHY	03	PL B553 159	A. Satpatny et	al.	(BELLE	Collab.)
WANG	03	PRL 90 201802	MZ. Wang et	al.	(BELLE	Collab.)
THENC	02	DD D67 000004	V Thomas at al			Callah
ZHLING	03	FK D07 092004	T. Zheng et al	•	DLLLL	Collab.)
ABE	02	PRL 88 021801	K. Abe <i>et al.</i>		(BELLE	Collab.)
ADE	025	DI DECE CEO	K Aba at al		ÌDELLE	Callah j
ADL	UZL	FL D520 256	R. Abe et al.		(DLLLL	Collab.)
ABE	02F	PL B526 247	K. Abe <i>et al.</i>		(BELLE	Collab.)
ΔRF	02H	PRI 88 171801	K Abe et al		(RELLE	Collah Ì
ADE	0211		IX. Abe et al.		(DELLE	Collab.)
ABE	02J	PRL 88 052002	K. Abe <i>et al.</i>		(BELLE	Collab.)
ABE	02K	PRI 88 181803	K Abe et al		(BELLE	Collah)
ADE	0210	TRE 00 101005			OFFE	
ABE	02M	PRL 89 071801	K. Abe <i>et al.</i>		(BELLE	Collab.)
ΔRF	02N	PL B538 11	K Abe et al		(RELLE	Collah
ADE	0211				OFFE	
ABE	020	PR D65 091103R	K. Abe <i>et al.</i>		(BELLE	Collab.)
ABE	020	PRI 89 122001	K Abe <i>et al</i>		(BELLE	Collab)
ADE	02.00	DD DCC 020007				
ABE	020	PR D66 032007	K. Abe <i>et al.</i>		(BELLE	Collab.)
ABE	02W	PRI 89 151802	K Abe et al		(BELLE	Collab)
ADE	007	DD D66 071100D				C-II-L)
ABE	02Z	PR D00 0/1102R	K. Abe et al.		(BELLE	Collab.)
ACOSTA	02C	PR D65 092009	D. Acosta et a	1.	(CDF	Collab.)
ΛΟΟΣΤΛ	020	PP D66 112002	D Acosta at a	.1		Collab
ACOSIA	020	TK D00 112002	D. ACOSLA EL A		(CDI	Collab.)
AFFOLDER	02B	PRL 88 071801	T. Affolder <i>et</i>	al.	(CDF	Collab.)
AHMED	02R	PR D66 031101R	S Ahmed et a	1	(ÈLEO	Collah Ì
	020		5. Anneu et a	<i>.</i>	(CLLO	Collab.)
ASNER	02	PR D65 031103R	D.M. Asner <i>et</i>	al.	(CLEO	Collab.)
ALIBERT	02	PR D65 032001	R Aubert et a	1	(RaBar	Collah
AUDEDT	02	DDI 00 101005		1.		
AUBERT	02C	PRL 88 101805	B. Aubert <i>et a</i>	1.	(BaBar	Collab.)
AUBERT	02D	PR D65 051502R	B. Aubert et a	1.	(BaBar	Collab.)
ALIDEDT	00E	DD DEE OF1101D	P Aubout at a	1	(Do Dor	Callah
AUDERI	02E	PR D05 051101R	D. Aubert et a	1.	(Dadar	Collab.)
AUBERT	02H	PRL 89 011802	B. Aubert et a	1.	(BaBar	Collab.)
Alco	020	DDI 90 160002 (orratur)P Aubort of a	1	(PaPar	Collab.)
AISO	020	EVE 03 103302 (enatur	IJD. Aubert et a	1.	(Dabar	Collab.)
AUBERT	021	PRL 88 221802	B. Aubert et a	1.	(BaBar	Collab.)
ALIBERT	021	DDI 88 221803	B Aubort of a	J	(BaBar	Collabí
AUDENT	025	TINE 00 221005	D. Aubert et a	<i>1.</i>		Collab.)
AUBERT	02K	PRL 88 231801	B. Aubert et a	1.	(BaBar	Collab.)
ALIBERT	021	PRI 88 241801	R Aubert et a	1	(RaBar	Collah)
AUDENT	0014					Call 1
AUBERI	02IVI	rkl δ9 001801	ы. Aubert <i>et a</i>	1.	(BaBar	Collab.)
AUBERT	02N	PR D66 032003	B. Aubert et a	1.	(BaBar	Collab.)
ALIDEDT	000	DDI 00 001000	D Aubart -+	1	(P-D-	Collat
AUDERI	02P	FIL 09 201002	ы. Audert <i>et a</i>	1.	(Баваг	collab.)
AUBERT	02Q	PRL 89 281802	B. Aubert et a	<i>I.</i>	(BaBar	Collab.)
	00	DDI 00 001002	D Priora at -1		ICI FO	Collab
DRIERE	02	FIL 09 001003	n. Driere et al.		(CLEO	conad.)
CASEY	02	PR D66 092002	B.C.K. Casev e	et al.	(BELLE	Collab.)
CHEN	UJB	PI 8546 106	K_F Chan of	al	(RELLE	Collab
CHEN	020			ui.		
COAN	02	PRL 88 062001	I.E. Coan et a	al.	(CLEO	Collab.)
Also	02R	PRI 88 060002 (erratur	TE Coan et a	al	(CLEO	Collah Ì
	020		I D I I			
DRUTSKOY	02	PL B542 171	A. Drutskoy <i>et</i>	al.	(RFTTE	Collab.)
DYTMAN	02	PR D66 091101R	S.A. Dytman	t al.	(CLEO	Collah
ECKUADT	02	DDI 00 051001			ICLEO	Collab
	02	LUE 03 731001	L. ECKNART <i>et a</i>	d1.	ULLEU	conad.)

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	00	DD D65 010000	KM/ Edwards at al	(CLEO Callah)
EDWARDS	02	PR D05 012002	K.W. Edwards et al.	(CLEO Collab.)
GABYSHEV	02	PR D66 091102R	N. Gabyshev <i>et al.</i>	(BELLE Collab.)
CODANC	02	DDI 88 001800	P Codang at al	(CLEO Collab)
GODANG	02	FRE 00 021002	R. Gouang et al.	(CLLO Collab.)
GORDON	02	PL B542 183	A. Gordon <i>et al.</i>	(BELLE Collab.)
	00		K Have at al	
HARA	02	PRL 89 251803	K. Hara <i>et al.</i>	(BELLE Collab.)
KROKOVNY	02	PRI 89 231804	P Korkovny <i>et al</i>	(BELLE Collab.)
	02	DDL 00 101000		
MAHAPATRA	02	PRL 88 101803	R. Mahapatra <i>et al.</i>	(CLEO Collab.)
NICHIDA	02	DDI 80 231801	S Nichida at al	(RELLE Collab)
NISHIDA	02	TILE 09 201001		(BELLE Collab.)
TOMURA	02	PL B542 207	T. Tomura <i>et al.</i>	(BELLE Collab.)
	01		A Abaabian at al	(DELLE Callab)
ADASHIAN	01	PRL 00 2009	A. Abashlah et al.	(DELLE CONAD.)
ABE	01D	PRL 86 3228	K. Abe <i>et al</i> .	(BELLE Collab.)
ADE	010	DDL 07 001000		
ABE	01G	PRL 87 091802	K. Abe <i>et al.</i>	(BELLE Collab.)
ARE	01H	PRI 87 101801	K Abe et al	(BELLE Collab.)
ADE .	0111			(DELLE COND.)
ABE	011	PRL 87 111801	K. Abe <i>et al.</i>	(BELLE Collab.)
ARE	01K	DR D64 071101	K Abo at al	(RELLE Collab.)
ADL	011	TK D04 071101	N. ADE EL al.	(BELLE Collab.)
ABE	01L	PRL 87 161601	K. Abe <i>et al.</i>	(BELLE Collab.)
ADE	0114	DI DE17 200	K Aba at al	(PELLE Callab.)
ADE	UTIVI	PL D317 309	R. Abe et al.	(DELLE CONAD.)
ABREU	01H	PL B510 55	P Abreu <i>et al</i>	(DELPHI Collab)
	010	DD DC4 000001		
ALEXANDER	01B	PR D64 092001	J.P. Alexander <i>et al.</i>	(CLEO Collab.)
ΔΜΜΔΡ	01R	PRI 87 271801	R Ammor et al	(CLEO Collab.)
	UID	TILE 07 271001		(CLEO CONAD.)
ANDERSON	01	PRL 86 2732	S. Anderson <i>et al.</i>	(CLEO Collab.)
	01R	DDI 97 191903	S Andorson at al	ÌCLEO Collab Ì
ANDENSON	010	TIL 07 101005	J. Anderson et al.	(CLLO CONAD.)
AUBERT	01	PRL 86 2515	B. Aubert <i>et al.</i>	(BaBar Collab.)
AUDEDT	01D	DDI 07 001001	D Aubrut at al	
AUBERT	010	PRL 87 091801	B. Aubert <i>et al.</i>	(BaBar Collab.)
AUBERT	01D	PRI 87 151801	B Aubert <i>et al</i>	(BaBar Collab)
AUDEDT	010	DDL 07 151001		
AUBERT	01E	PRL 87 151802	B. Aubert <i>et al.</i>	(BaBar Collab.)
ALIBERT	01F	PRI 87 201803	R Aubert et al	(BaBar Collah)
NODERT	011	TRE 07 201005		
AUBERT	01G	PRL 87 221802	B. Aubert <i>et al.</i>	(BaBar Collab.)
ALIDEDT	01 LL	DDI 07 0/1001	P Aubort at al	(PaPar Callah)
AUBLIN	0111	FIL 07 241001	D. Aubert et al.	(Dabar Collab.)
AUBERT	011	PRL 87 241803	B. Aubert <i>et al.</i>	(BaBar Collab.)
DADATE	01D	EDI (20 421	P Parata at al	(ALEPH Collab.)
DANAIL	010	LFJ C20 431	R. Darate et al.	(ALLETT CONAD.)
BRIERE	01	PRL 86 3718	R.A. Biere <i>et al.</i>	(CLEO Collab.)
	01			
EDWARDS	01	PRL 80 30	K.W. Edwards <i>et al.</i>	(CLEO Collab.)
IAFFF	01	PRI 86 5000	D laffe et al	(CLEO Collab)
	01			
RICHICHI	01	PR D03 031103R	S.J. RICHICHI <i>et al.</i>	(CLEO Collab.)
ABBIENDI	000	PL B482 15	G Abbiendi <i>et al</i>	(OPAL Collab.)
		DL D402 200		
ABBIENDI,G	00B	PL B493 200	G. Abbiendi <i>et al.</i>	(OPAL Collab.)
ARE	000	PR D62 071101R	K Abe et al	(SLD Collab)
, DE	000			
AFFOLDER	00C	PR D61 072005	I. Affolder <i>et al.</i>	(CDF Collab.)
	00N	DDI 05 4660	T Affolder at al	CDE Callah Í
AFFOLDER	0011	FIL 03 4000	I. Alloluer et al.	(CDF Collab.)
AHMED	00B	PR D62 112003	S. Ahmed <i>et al.</i>	(CLEO Collab.)
ΔΝΙΔΟΤΔΟΟΛ/	00	DDI 0/ 1202	A Apactaccov at al	ICLED Callab J
ANASTASSOV	00	FIL 04 1393	A. Andstassov et al.	(CLLO Collab.)
ARTUSO	00	PRL 84 4292	M. Artuso <i>et al.</i>	(CLEO Collab.)
	00	DD D62 051101	P Avony at al	CLEO Callabá
AVERT	00	PR D02 051101	P. Avery et al.	(CLEO Collab.)
BARATE	00Q	PL B492 259	R. Barate <i>et al.</i>	(ALEPH Collab.)
DADATE	000	DI P402 275	P Parata at al	(ALEDH Collab.)
DARATE	UUK	FL D492 213	R. Darate et al.	(ALLETT CONAD.)
BEHRENS	00	PR D61 052001	B.H. Behrens <i>et al.</i>	(CLEO Collab.)
DELIDENC		DI D400 26	PU Pahrana at al	ICLED Callah J
DEHKENS	000	FL D490 30	D.H. Defirens et al.	(CLLO CONAD.)
BERGFELD	00B	PR D62 091102R	T. Bergfeld <i>et al.</i>	(CLEO Collab.)
CHEN	00		C Chan at al	(CLEO Callah)
CHEN	00	PRL 05 525	5. Chen et al.	(CLEO Collab.)
COAN	00	PRL 84 5283	T.E. Coan <i>et al.</i>	(CLEO Collab.)
	00	DDI 95 515	D Cronin Honnorsy at al	CLEO Callabá
CRONIN-HEN.	00	FRE 05 515	D. Cronn-Hennessy et al.	(CLLO Collab.)
CSORNA	00	PR D61 111101	S.E. Csorna <i>et al.</i>	(CLEO Collab.)
	00	DDI 05 0001	C.D. lassan at al	(CLEO Callah)
JESSUP	00	PRL 05 2001	C.P. Jessop <i>et al.</i>	(CLEO Collab.)
LIPELES	00	PR D62 032005	E. Lipeles <i>et al.</i>	(CLEO Collab.)
DICLUCIU	00			
RICHICHI	00	PRL 85 520	S.J. RICHICHI <i>et al.</i>	(CLEO Collab.)
ABBIENDI	991	FPI C12 609	G Abbiendi <i>et al</i>	(OPAL Collab.)
ADE	001/			
ABE	99K	PK DOU 051101	F. Abe et al.	(CDF Collab.)
ABE	990	PR D60 072003	F. Abe <i>et al</i>	(CDF Collab)
	000	DDI 02 0070		
AFFULDER	99B	PKL 83 33/8	I. Affolder <i>et al.</i>	(CDF Collab.)
AFFOI DFR	990	PR D60 112004	T. Affolder <i>et al</i>	(CDF Collab)
	00			
AK I USU	99	rkl 82 3020	ivi. Artuso <i>et al.</i>	(CLEO Collab.)
BARTELT	ga	PRI 82 3746	I Bartelt et al	(CLEO Collab)
COAN	99	PR D59 111101	I.E. Coan <i>et al.</i>	(CLEO Collab.)
ABBOTT	98R	PL B423 410	B Abbott et al	(D0 Collab)
	00			
ABE	98	PK D57 K3811	F. Abe et al.	(CDF Collab.)
ABF	98R	PR D57 5382	F Abe <i>et al</i>	(CDF Collab)
	000			
ARE	98C	PKL 80 2057	г. Abe <i>et al.</i>	(CDF Collab.)
Also	996	PR D59 032001	F Abe et al	CDF Collab Ì
1 130	230			
ABE	98O	PR D58 072001	⊢. Abe <i>et al.</i>	(CDF Collab.)
ARE	980	PR D58 002002	F Abe et al	CDF Collab 1
	200	200 002002		

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ABE	9811	PRI 81 5513	F Abe et al	(CDE Collab.)
ADE	001/	DDI 01 5740	E Abo at al	(CDE Collab.)
ADL	90 V	FRE 01 5742	F. ADE EL al.	(CDF Collab.)
ACCIARRI	98D	EPJ C5 195	M. Acciarri <i>et al.</i>	(L3 Collab.)
ACCIARRI	98S	PL B438 417	M. Acciarri <i>et al.</i>	(L3 Collab.)
ACKERSTAEE	087	EDI (5.370	K Ackarstaff at al	(OPAL Collab.)
	90Z	EI J CJ 373		
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.)
BERGEELD	98	PRI 81 272	T Bergfeld et al	(CLEO Collab)
	00	DDI 90 0760	C Brandanhrum at al	(CLEO Collab.)
DRANDEND	90	PRL 00 2702	G. Drandenbrug et al.	(CLEO Collab.)
GODANG	98	PRL 80 3456	R. Godang <i>et al.</i>	(CLEO Collab.)
NEMATI	98	PR D57 5363	B. Nemati <i>et al.</i>	(CLEO Collab.)
ARE	071	DRI 70 500	K Abo at al	(SLD Collab.)
ADL	915	T NL 79 390	R. Abe et al.	
ABREU	97F	ZPHY C74 19	P. Abreu <i>et al.</i>	(DELPHI Collab.)
Also	97K	ZPHY C75 579 erratum	P. Abreu <i>et al.</i>	(DELPHI Collab.)
ABREU	97N	7PHY C76 579	P Abreu et al	(DELPHI Collab)
	070			
ACCIARRI	97B	PL B391 474	IVI. Acciarri et al.	(L3 Collab.)
ACCIARRI	97C	PL B391 481	M. Acciarri <i>et al.</i>	(L3 Collab.)
ACKERSTAFE	97G	PL B395 128	K Ackerstaff <i>et al</i>	(OPAL Collab)
ACKEDSTAFE	0711		K Askersteff at al	(ODAL Callab.)
ACKERSTAFF	970	ZPHY C70 401	K. Ackerstall et al.	(OPAL Collab.)
ACKERSTAFF	97V	ZPHY C76 417	K. Ackerstaff <i>et al.</i>	(OPAL Collab.)
ARTUSO	97	PL B399 321	M. Artuso <i>et al.</i>	(CLEO Collab.)
ASNER	97	PRI 70 700	D Asner et al	(CLEO Collab.)
	07	DDI 70 0000		
ATHANAS	97	PRL 79 2208	IVI. Athanas <i>et al.</i>	(CLEO Collab.)
BUSKULIC	97	PL B395 373	D. Buskulic <i>et al.</i>	(ALEPH Collab.)
BUSKULIC	97D	7PHY (75 397	D. Buskulic et al	(ALEPH Collab)
	07	DDI 70 2125	Y Eu et el	(CLEO Collab.)
	91	TRE 79 5125		
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.)
ARE	96H	PRI 76 2015	F Abe et al	CDE Collab)
ADE	061	DDI 76 4675	E Abo at al	(CDE Collab.)
	901			
ABE	96Q	PR D54 6596	F. Abe <i>et al.</i>	(CDF Collab.)
ABREU	96P	ZPHY C71 539	P. Abreu <i>et al.</i>	(DELPHI Collab.)
ABREU	96Q	ZPHY C72 17	P. Abreu <i>et al.</i>	(DELPHI Collab.)
ACCIARRI	96E	PL B383 487	M. Acciarri <i>et al.</i>	L3 Collab.
	06D	7PHV (72 207	W/ Adam at al	(DELPHI Collab.)
	900			
ALBRECHT	96D	PL B374 256	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
ALEXANDER	96T	PRL 77 5000	J.P. Alexander <i>et al.</i>	(CLEO Collab.)
ALEXANDER	96V	ZPHY C72 377	G. Alexander <i>et al.</i>	(OPAL Collab.)
ASNER	96	PR D53 1039	DM Asper et al	(CLEO Collab.)
	060	DDI 76 1570	PC Pariah at al	(CLEO Collab.)
DARISH	900	FRE 70 1570	D.C. Darisi et al.	
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.)
BUSKULIC	96V	PL B384 471	D. Buskulic <i>et al</i>	(ALEPH Collab)
	06	DDI 76 2000	LE Duboser at al	(CLEO Collab.)
	90	DD DF2 4724		
GIBAUT	90	PR D53 4734	D. Gidaut et al.	(CLEO Collab.)
PDG	96	PR D54 1	R. M. Barnett <i>et al.</i>	
ABE	95Z	PRL 75 3068	F. Abe <i>et al.</i>	(CDF Collab.)
ARRELL	95 N	PL B357 255	P Abreu et al	(DEÌ PHI, Collab Ì
		7047 669 12	D Abreu et al	(DELDHI Callab.)
ADREU	950		r. Abreu et al.	
ACCIARRI	95H	PL B363 127	M. Acciarri <i>et al.</i>	(L3 Collab.)
ACCIARRI	95I	PL B363 137	M. Acciarri <i>et al.</i>	(L3 Collab.)
ADAM	95	ZPHY C68 363	W Adam <i>et al</i>	(DELPHL Collab)
	051		P Akors at al	(OPAL Collab.)
	9JJ			
AKEKS	951	ZPHY C07 379	R. Akers <i>et al.</i>	(UPAL Collab.)
ALEXANDER	95	PL B341 435	J. Alexander <i>et al.</i>	(CLEO Collab.)
Also	95C	PL B347 469 (erratum)	J. Alexander <i>et al.</i>	(CLEO Collab.)
BARISH	95	PR D51 1014	RC Barish et al	(CLEO Collab.)
BUSKING	051	DI 8350 326	D Buskulic at al	(ALEDU Callat)
	3010			
ABE	94D	PRL 72 3456	F. Abe <i>et al.</i>	(CDF Collab.)
ABREU	94M	PL B338 409	P. Abreu <i>et al.</i>	(DELPHI Collab.)
AKERS	94C	PL B327 411	R. Akers <i>et al.</i>	(OPAL Collab.)
AKERS	94H	PL B336 585	R Akers et al	(OPAL Collab.)
	041	DI D227 106	D Allors at al	
	94J	LF D001 100	n. Akers et al.	(OPAL Collab.)
AKERS	94L	PL B337 393	R. Akers <i>et al.</i>	(OPAL Collab.)
ALAM	94	PR D50 43	M.S. Alam <i>et al.</i>	(CLEO Collab.)
ALBRECHT	94	PL B324 249	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
AL BRECHT	94G	PL B340 217	H Albrecht <i>et al</i>	(ARGUS Collab.)
	0/	DR DA0 5701	P Ammar at al	
	94			
ATHANAS	94	PKL /3 3503	IVI. Athanas <i>et al.</i>	(CLEO Collab.)
Also	95	PRL 74 3090 (erratum)	M. Athanas <i>et al.</i>	(CLEO Collab.)

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BUSKULIC PDG PROCARIO STONE	94B 94 94 94	PL B322 441 PR D50 1173 PRL 73 1472 HEPSY 93-11	D. Buskulic <i>et al.</i> L. Montanet <i>et al.</i> M. Procario <i>et al.</i> S. Stone	(ALEPH Collab.) (CERN, LBL, BOST+) (CLEO Collab.)
STONE Published i ABREU ACTON ALBRECHT ALBRECHT ALBRECHT ALEXANDER AMMAR BARTELT BATTLE BEAN BUSKULIC Also BUSKULIC SANGHERA	94 93D 93G 93C 93 93E 93B 93 93 93B 93D 94H 93K 93C	HEPSY 93-11 becays, 2nd Edition, World ZPHY C57 181 PL B312 253 PL B307 247 ZPHY C57 533 ZPHY C60 11 PL B319 365 PRL 71 674 PRL 71 1680 PRL 71 1680 PRL 71 3922 PRL 70 2681 PL B307 194 PL B325 537 (errata) PL B313 498 PR D47 791	 S. Stone Scientific, Singapore P. Abreu et al. P. Abreu et al. P.D. Acton et al. H. Albrecht et al. H. Albrecht et al. J. Alexander et al. R. Ammar et al. J.E. Bartelt et al. M. Battle et al. A. Bean et al. D. Buskulic et al. D. Buskulic et al. D. Buskulic et al. S. Sanghera et al. 	(DELPHI Collab.) (DELPHI Collab.) (OPAL Collab.) (ARGUS Collab.) (ARGUS Collab.) (CLEO Collab.) (CLEO Collab.) (CLEO Collab.) (CLEO Collab.) (ALEPH Collab.) (ALEPH Collab.) (ALEPH Collab.)
ALBRECHT ALBRECHT ALBRECHT BORTOLETTO	92C 92G 92L 92	PL B275 195 ZPHY C54 1 ZPHY C55 357 PR D45 21	 H. Albrecht <i>et al.</i> H. Albrecht <i>et al.</i> H. Albrecht <i>et al.</i> D. Bortoletto <i>et al.</i> 	(ARGUS Collab.) (ARGUS Collab.) (ARGUS Collab.) (CLEO Collab.)
HENDERSON KRAMER ALBAJAR ALBAJAR	92 92 91C 91E 01B	PR D45 2212 PL B279 181 PL B262 163 PL B273 540 PL B254 288	 S. Henderson <i>et al.</i> G. Kramer, W.F. Palmer C. Albajar <i>et al.</i> H. Albracht <i>et al.</i> 	(CLEO Collab.) (HAMB, OSU) (UA1 Collab.) (UA1 Collab.) (APCUS Collab.)
ALBRECHT ALBRECHT ALBRECHT BERKELMAN "Decays of	91D 91C 91E 91 <i>B</i> Me	PL B254 200 PL B255 297 PL B262 148 ARNPS 41 1 esons"	H. Albrecht <i>et al.</i> H. Albrecht <i>et al.</i> H. Albrecht <i>et al.</i> K. Berkelman, S. Stone	(ARGUS Collab.) (ARGUS Collab.) (ARGUS Collab.) (CORN, SYRA)
FULTON ALBRECHT ALBRECHT ANTREASYAN BORTOLETTO ELSEN	91 90B 90J 90B 90 90	PR D43 651 PL B241 278 ZPHY C48 543 ZPHY C48 553 PRL 64 2117 ZPHY C46 349	 R. Fulton <i>et al.</i> H. Albrecht <i>et al.</i> H. Albrecht <i>et al.</i> D. Antreasyan <i>et al.</i> D. Bortoletto <i>et al.</i> E. Elsen <i>et al.</i> 	(CLEO Collab.) (ARGUS Collab.) (ARGUS Collab.) (Crystal Ball Collab.) (CLEO Collab.) (JADE Collab.)
ROSNER WAGNER ALBRECHT ALBRECHT ALBRECHT ALBRECHT	90 90 89C 89G 89J 89J	PR D42 3732 PRL 64 1095 PL B219 121 PL B229 304 PL B229 175 PL B232 554	J.L. Rosner S.R. Wagner <i>et al.</i> H. Albrecht <i>et al.</i> H. Albrecht <i>et al.</i> H. Albrecht <i>et al.</i> H. Albrecht <i>et al.</i>	(Mark II Collab.) (ARGUS Collab.) (ARGUS Collab.) (ARGUS Collab.) (ARGUS Collab.)
ARTUSO AVERILL AVERY BEBEK BORTOLETTO	89 89 89B 89B 89 89	PRL 62 2233 PR D39 123 PL B223 470 PRL 62 8 PRL 62 2436	M. Artuso <i>et al.</i> D.A. Averill <i>et al.</i> P. Avery <i>et al.</i> C. Bebek <i>et al.</i> D. Bortoletto <i>et al.</i>	(CLEO Collab.) (HRS Collab.) (CLEO Collab.) (CLEO Collab.) (CLEO Collab.) (CLEO Collab.)
BORTOLETTO ALBRECHT ALBRECHT ALBRECHT ALBRECHT ALBRECHT	89B 88F 88K 87C 87D 87I	PRL 63 1667 PL B209 119 PL B215 424 PL B185 218 PL B199 451 PL B192 245	 D. Bortoletto <i>et al.</i> H. Albrecht <i>et al.</i> 	(CLEO Collab.) (ARGUS Collab.) (ARGUS Collab.) (ARGUS Collab.) (ARGUS Collab.) (ARGUS Collab.)
ALBRECHT AVERY BEAN BEBEK ALAM ALBRECHT PDG CHEN HAAS	87J 87 87B 87 86 86 86 85 85	PL B197 452 PL B183 429 PRL 58 183 PR D36 1289 PR D34 3279 PL B182 95 PL 170B PR D31 2386 PRL 55 1248	 H. Albrecht et al. P. Avery et al. A. Bean et al. C. Bebek et al. M.S. Alam et al. H. Albrecht et al. M. Aguilar-Benitez et al. A. Chen et al. J. Haas et al. 	(ARGUS Collab.) (CLEO Collab.) (CLEO Collab.) (CLEO Collab.) (CLEO Collab.) (ARGUS Collab.) (CERN, CIT+) (CLEO Collab.) (CLEO Collab.)
AVERY GILES BEHRENDS	84 84 83	PRL 53 1309 PR D30 2279 PRL 50 881	P. Avery <i>et al.</i>R. Giles <i>et al.</i>S. Behrends <i>et al.</i>	(CLEO Collab.) (CLEO Collab.) (CLEO Collab.)

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