$B^{\pm}/B^{0}$  ADMIXTURE

### **B** DECAY MODES

The branching fraction measurements are for an admixture of *B* mesons at the  $\Upsilon(4S)$ . The values quoted assume that  $B(\Upsilon(4S) \rightarrow B\overline{B}) = 100\%$ .

For inclusive branching fractions, e.g.,  $B \rightarrow D^{\pm}$  anything, the treatment of multiple *D*'s in the final state must be defined. One possiblity would be to count the number of events with one-or-more *D*'s and divide by the total number of *B*'s. Another possibility would be to count the total number of *D*'s and divide by the total number of *B*'s, which is the definition of average multiplicity. The two definitions are identical when only one of the specified particles is allowed in the final state. Even though the "one-or-more" definition seems sensible, for practical reasons inclusive branching fractions are almost always measured using the multiplicity definition. For heavy final state particles, authors call their results inclusive branching fractions while for light particles some authors call their results multiplicities. In the *B* sections, we list all results as inclusive branching fractions can exceed 100% and that inclusive partial widths can exceed total widths, just as inclusive cross sections can exceed total cross sections.

 $\overline{B}$  modes are charge conjugates of the modes below. Reactions indicate the weak decay vertex and do not include mixing.

	Mode	Sα Fraction (Γ <sub>i</sub> /Γ) Conf	cale factor/ idence level
	Semileptonic and	l leptonic modes	
$\Gamma_1$	$B  ightarrow e^+  u_e$ anything	[a] ( $10.41 \pm 0.29$ ) %	S=1.2
Γ2	$B \rightarrow \overline{p} e^+ \nu_e$ anything	$<$ 1.6 $\times 10^{-3}$	CL=90%
Γ <sub>3</sub>	$B  ightarrow \ \mu^+  u_\mu$ anything	[a] ( $10.3 \pm 0.5$ ) %	
Г <sub>4</sub>	$B \rightarrow \ell^+ \nu_\ell$ anything	[a,b] ( 10.45±0.21) %	
Γ <sub>5</sub>	$B  ightarrow D^- \ell^+  u_\ell$ anything	$[b]$ ( 2.7 $\pm 0.8$ )%	
Γ <sub>6</sub>	$B  ightarrow \overline{D}{}^0 \ell^+  u_\ell$ anything	[b] ( 7.0 $\pm$ 1.4 )%	
Γ <sub>7</sub>	$B  ightarrow \ D^{st -}  \ell^+   u_\ell$ anything		
Г <sub>8</sub>	$B  ightarrow \ D^{st 0}  \ell^+   u_\ell$ anything		
Γg	$B \rightarrow \overline{D}^{**} \ell^+ \nu_{\ell}$	$[b,c]$ ( 2.7 $\pm 0.7$ )%	
Γ <sub>10</sub>	$B  ightarrow ~\overline{D}_1(2420) \ell^+  u_\ell$ any-	( 7.4 $\pm 1.6$ ) $ imes 10^{-3}$	
	thing		
$\Gamma_{11}$	$B  ightarrow D \pi \ell^+  u_\ell$ anything $+$	( 2.3 $\pm$ 0.4 )%	
	$D^*  \pi  \ell^+   u_\ell$ anything		
$\Gamma_{12}$	$B  ightarrow ~\overline{D}_2^*(2460) \ell^+  u_\ell$ any-	$<$ 6.5 $\times 10^{-3}$	CL=95%
	thing		

 $B \to D^{*-} \pi^+ \ell^+ \nu_\ell$  any- ( 1.00±0.34) %  $\Gamma_{13}$ thing  $B \rightarrow D_s^- \ell^+ \nu_\ell \text{ anything} \qquad [b] < 9 \qquad \times 10^{-3}$  $B \rightarrow D_s^- \ell^+ \nu_\ell K^+ \text{ anything} \qquad [b] < 6 \qquad \times 10^{-3}$  $B \rightarrow D_{\epsilon}^{-} \ell^{+} \nu_{\ell}$  anything  $\Gamma_{14}$ CL=90%  $\Gamma_{15}$ CL=90%  $B \rightarrow D_{s}^{-} \ell^{+} \nu_{\ell} K^{0}$  anything  $[b] < 9 \times 10^{-3}$ Γ<sub>16</sub> CL=90%  $\Gamma_{17} \qquad B \rightarrow \ell^+ \nu_\ell$  noncharmed [b]  $\Gamma_{18}^{\,\,\cdot} \qquad B 
ightarrow K^+ \widetilde{\ell}^+ 
u_\ell$  anything [b]  $(6.0 \pm 0.5)\%$  $\Gamma_{19}^{-1} \qquad B \rightarrow K^{-}\ell^{+}\nu_{\ell}$  anything [b] (10 ±4) × 10<sup>-3</sup>  $B \rightarrow K^0 / \overline{K}^0 \ell^+ \nu_\ell \text{ anything} \quad [b] \quad (4.4 \pm 0.5) \%$  $\Gamma_{20}$  $D, D^*$ , or  $D_s$  modes  $\Gamma_{21} \quad B \rightarrow D^{\pm}$  anything  $(24.1 \pm 1.9)\%$  $(63.1 \pm 2.9)\%$  $\Gamma_{22} \quad B \rightarrow D^0 / \overline{D}^0$  anything S=1.1 $\begin{array}{lll} \Gamma_{22} & B & \to & D^*(2010)^{\pm} \text{ anything} \\ \Gamma_{24} & B & \to & D^*(2007)^0 \text{ anything} \\ \Gamma_{25} & B & \to & D_s^{\pm} \text{ anything} \end{array} \begin{array}{lll} (22.7 \pm 1.6) \% \\ (26.0 \pm 2.7) \% \\ (10.0 \pm 2.5) \% \end{array}$  $\Gamma_{26}$   $b \rightarrow c \overline{c} s$ (22 ±4)%  $\Gamma_{27}$   $B \rightarrow D_s D$ ,  $D_s^* D$ ,  $D_s D^*$ , or [d] ( 4.9 ±1.3 )%  $D^*_{s}D^*$  $B \rightarrow D^*(2010)\gamma$ < 1.1  $\times 10^{-3}$  $\Gamma_{28}$ CL=90%  $B \to D_{s}^{+}\pi^{-}, D_{s}^{*+}\pi^{-}, D_{s}^{+}\rho^{-}, [d] < 5 \times 10^{-4}$  $D_{s}^{*+}\rho^{-}, D_{s}^{+}\pi^{0}, D_{s}^{*+}\pi^{0},$  $D_{s}^{+}\eta, D_{s}^{*+}\eta, D_{s}^{+}\rho^{0},$ Γ29 CL=90%  $D_s^{*+}\rho^0$ ,  $D_s^+\omega$ ,  $D_s^{*+}\omega$  $\Gamma_{30} \quad B \rightarrow D_{s1}(2536)^+$  anything  $< 9.5 \times 10^{-3}$ CL=90% Charmonium modes  $\begin{array}{rll} B \to J/\psi(1S) {\rm anything} & ( & 1.13 \pm 0.06) \ \% \\ B \to & J/\psi(1S) ({\rm direct}) \ {\rm any-} & ( & 8.0 \ \pm 0.8 \ ) \times 10^{-3} \end{array}$  $\Gamma_{31}$   $B \rightarrow J/\psi(1S)$  anything  $\Gamma_{32}$ thing  $\begin{array}{cccc} (& 3.5 \ \pm 0.5 \ ) \times 10^{-3} \\ (& 4.2 \ \pm 0.7 \ ) \times 10^{-3} \\ (& 3.7 \ \pm 0.7 \ ) \times 10^{-3} \end{array}$  $\Gamma_{33}$   $B \rightarrow \psi(2S)$  anything  $\Gamma_{34} \quad B \rightarrow \chi_{c1}(1P)$  anything  $B \rightarrow \chi_{c1}(1P)$ (direct) any- $\Gamma_{35}$ thing  $\Gamma_{36} \quad B \rightarrow \chi_{c2}(1P)$  anything CL=90%  $\Gamma_{37}$   $B \rightarrow \eta_c(1S)$  anything CL=90% K or K\* modes  $\Gamma_{38}$   $B \rightarrow K^{\pm}$  anything [d] (78.9 ±2.5)%  $\Gamma_{39} \qquad B \rightarrow K^+ \text{ anything}$  $(66 \pm 5)\%$  $\Gamma_{40} \qquad B \rightarrow K^- \text{ anything}$ (13 ±4)%  $\Gamma_{41} \quad B \rightarrow K^0 / \overline{K}^0$  anything [d] (64 ±4)%  $B \rightarrow K^*(892)^{\pm}$  anything  $\Gamma_{42}$  $(18 \pm 6)\%$  $B \rightarrow K^{*}(892)^{0}/\overline{K}^{*}(892)^{0}$  any- [d] (14.6 ± 2.6)%  $\Gamma_{43}$ thing HTTP://PDG.LBL.GOV Page 2 Created: 6/29/1998 12:36

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Light unflavored meson modes $\Gamma_{52}$ $B \rightarrow \pi^{\pm}$ anything $[d,e]$ $(359 \pm 7)$ $\%$ $\Gamma_{53}$ $B \rightarrow \eta$ anything $(17.6 \pm 1.6)$ $\%$ $\Gamma_{54}$ $B \rightarrow \rho^0$ anything $(21 \pm 5)$ $\%$ $\Gamma_{55}$ $B \rightarrow \omega$ anything $< 81$ $\%$ $\Gamma_{56}$ $B \rightarrow \phi$ anything $(3.5 \pm 0.7)$ $S=1.8$ $\Gamma_{56}$ $B \rightarrow \phi$ anything $(6.4 \pm 1.1)$ $\%$ $\Gamma_{58}$ $B \rightarrow \Lambda_c^+$ anything $(6.4 \pm 1.1)$ $\%$ $\Gamma_{59}$ $B \rightarrow \Lambda_c^- e^+$ anything $(3.6 \pm 0.7)$ $\%$ $\Gamma_{61}$ $B \rightarrow \Lambda_c^- pe^+ \nu_e$ $< 1.5 \times 10^{-3}$ $CL=90\%$ $\Gamma_{61}$ $B \rightarrow \Lambda_c^- pe^+ \nu_e$ $< 1.5 \times 10^{-3}$ $CL=90\%$ $\Gamma_{63}$ $B \rightarrow \overline{\Sigma}_c^-$ anything $(4.2 \pm 2.4) \times 10^{-3}$ $CL=90\%$ $\Gamma_{64}$ $B \rightarrow \overline{\Sigma}_c^-$ anything $(4.6 \pm 2.4) \times 10^{-3}$ $CL=90\%$
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$
$\begin{array}{ccccccc} & \text{Baryon modes} \\ \hline F_{57} & B \rightarrow & \Lambda_c^{\pm} \text{ anything} & (& 6.4 \ \pm 1.1 \ ) \ \% \\ \hline F_{58} & B \rightarrow & \Lambda_c^{+} \text{ anything} \\ \hline F_{59} & B \rightarrow & \Lambda_c^{-} \text{ anything} \\ \hline F_{60} & B \rightarrow & \Lambda_c^{-} e^+ \text{ anything} \\ \hline F_{61} & B \rightarrow & \Lambda_c^{-} p \text{ anything} \\ \hline F_{62} & B \rightarrow & \Lambda_c^{-} p e^+ \nu_e \\ \hline F_{63} & B \rightarrow & \overline{\Sigma}_c^{} \text{ anything} \\ \hline F_{63} & B \rightarrow & \overline{\Sigma}_c^{} \text{ anything} \\ \hline F_{64} & B \rightarrow & \overline{\Sigma}_c^{-} \text{ anything} \\ \hline F_{65} & B \rightarrow & \overline{\Sigma}_c^{0} \text{ anything} \\ \hline \end{array} \begin{array}{c} (& 4.6 \ \pm 2.4 \ ) \times 10^{-3} \\ (& 4.6 \ \pm 2.4 \ ) \times 10^{-3} \end{array}$
$ \begin{array}{llllllllllllllllllllllllllllllllllll$
$ \begin{array}{llllllllllllllllllllllllllllllllllll$
$ \begin{array}{lll} \Gamma_{59} & B \rightarrow \Lambda_c^- \text{ anything} \\ \Gamma_{60} & B \rightarrow \Lambda_c^- e^+ \text{ anything} \\ \Gamma_{61} & B \rightarrow \Lambda_c^- p \text{ anything} \\ \Gamma_{62} & B \rightarrow \Lambda_c^- p e^+ \nu_e \\ \Gamma_{63} & B \rightarrow \overline{\Sigma}_c^- \text{ anything} \\ \Gamma_{64} & B \rightarrow \overline{\Sigma}_c^- \text{ anything} \\ \Gamma_{65} & B \rightarrow \overline{\Sigma}_c^0 \text{ anything} \\ \Gamma_{65} & B \rightarrow \overline{\Sigma}_c^0 \text{ anything} \\ \end{array} $ $ \begin{array}{lll} < 3.2 & \times 10^{-3} & \text{CL=90\%} \\ < 3.6 \pm 0.7 & \text{\%} \\ $
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$\Gamma_{64}  B \rightarrow \overline{\Sigma}_{c}^{c} \text{ anything} \qquad (4.6 \pm 2.4) \times 10^{-3}  \text{CL}=90\%$ $\Gamma_{65}  B \rightarrow \overline{\Sigma}_{c}^{0} \text{ anything} \qquad (4.6 \pm 2.4) \times 10^{-3}$
$\Gamma_{65}  B \rightarrow \overline{\Sigma}_{0}^{0}$ anything (4.6 ±2.4) × 10 <sup>-3</sup>
$\Gamma_{ee} B \rightarrow \overline{\Sigma}^0 N(N = p \text{ or } n) < 15 \times 10^{-3} \text{ Cl} = 90\%$
$\Gamma_{c7}  B \rightarrow =^{0} \text{ anything} \qquad (14 \pm 0.5) \times 10^{-4}$
$ \begin{array}{c} \text{ (111 \pm 0.5)} \times 10 \\ \text{ (111 \pm 0.5)} \times 10 \\ \text{ (111 \pm 0.5)} \times 10 \end{array} $
$- \frac{-1}{2} - \frac{-1}{2$
$I_{68}  B \rightarrow = c \text{ anything} \qquad (4.5 + 1.2 + 1$
$\times B(= c \rightarrow = \pi^+ \pi^+)$
$\Gamma_{69}  B \to p/\overline{p} \text{ anything} \qquad [d]  (8.0 \pm 0.4) \%$
$I_{70}  B \rightarrow p/\overline{p}$ (direct) anything [d] (5.5 ±0.5)%
$I_{71}  B \rightarrow \Lambda/\Lambda \text{anything} \qquad [d] (4.0 \pm 0.5)\%$
$I_{72} \xrightarrow{B \to \Lambda} anything$
$ [73  B \rightarrow \text{Aanything} ] $ $ [A]  (-2.7 \pm 0.6) \times 10^{-3} $
$\begin{bmatrix} a \end{bmatrix} \begin{pmatrix} 2 & 7 \pm 0 \end{pmatrix} \times 10^{\circ}$
$\Gamma_{76} \xrightarrow{D} \rightarrow \overline{pn} \text{anything} \qquad (0.0 \pm 0.0) \%$ $\Gamma_{76} \xrightarrow{R} \rightarrow \overline{pn} \text{anything} \qquad (247\pm0.23) \%$
$\Gamma_{77} \xrightarrow{B}{} A \overline{n} / \overline{A} p \text{ anything} \qquad [d] (25 \pm 0.4)\%$
$\Gamma_{78}  B \rightarrow \Lambda\Lambda$ anything $< 5 \times 10^{-3}$ CL=90%

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

Γ <sub>79</sub>	$B \rightarrow e^+ e^- s$	B1	<	5.7	imes 10 <sup>-5</sup>	CL=90%
Γ <sub>80</sub>	$B  ightarrow \mu^+ \mu^- s$	B1	<	5.8	imes 10 <sup>-5</sup>	CL=90%
Γ <sub>81</sub>	$B  ightarrow \ e^{\pm} \mu^{\mp} s$	LF	<	2.2	imes 10 <sup>-5</sup>	CL=90%

- [a] These values are model dependent. See 'Note on Semileptonic Decays' in the  $B^+$  Particle Listings.
- [b] An  $\ell$  indicates an e or a  $\mu$  mode, not a sum over these modes.
- [c]  $D^{**}$  stands for the sum of the  $D(1 \ {}^{1}P_{1})$ ,  $D(1 \ {}^{3}P_{0})$ ,  $D(1 \ {}^{3}P_{1})$ ,  $D(1 \ {}^{3}P_{2})$ ,  $D(2 \ {}^{1}S_{0})$ , and  $D(2 \ {}^{1}S_{1})$  resonances.
- [d] The value is for the sum of the charge states of particle/antiparticle states indicated.
- [e] Inclusive branching fractions have a multiplicity definition and can be greater than 100%.

### $B^{\pm}/B^{0}$ ADMIXTURE BRANCHING RATIOS

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

These branching fraction values are model dependent. See the note on "Semileptonic Decays of *B* Mesons at the beginning of the  $B^+$  Particle Listings.

VALUE	DOCUMENT ID	TECN	COMMENT
0.1045±0.0021 OUR AVERAGE	Includes data from the	2 datab	locks that follow this
	one.		
$0.108 \pm 0.002 \pm 0.0056$	<sup>1</sup> HENDERSON 92	CLEO	$e^+e^-  ightarrow ~ \Upsilon(4S)$

<sup>1</sup> HENDERSON 92 measurement employs *e* and  $\mu$ . The systematic error contains 0.004 in quadrature from model dependence. The authors average a variation of the Isgur, Scora, Grinstein, and Wise model with that of the Altarelli-Cabibbo-Corbò-Maiani-Martinelli model for semileptonic decays to correct the acceptance.

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

### $\Gamma_1/\Gamma$

Γ₄/Γ

These branching fraction values are model dependent. See the note on "Semileptonic Decays of B Mesons at the beginning of the  $B^+$  Particle Listings.

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

**0.1041±0.0029 OUR AVERAGE** Error includes scale factor of 1.2.

$0.1049 \!\pm\! 0.0017 \!\pm\! 0.0043$	<sup>2</sup> BARISH	96B CLE2	$e^+e^-  ightarrow ~\Upsilon(4S)$
$0.097 \ \pm 0.005 \ \pm 0.004$	<sup>3</sup> ALBRECHT	93н ARG	$e^+e^-  ightarrow ~\Upsilon(4S)$
$0.100 \ \pm 0.004 \ \pm 0.003$	<sup>4</sup> YANAGISAWA	91 CSB2	$e^+e^-  ightarrow ~\Upsilon(4S)$
$0.103 \ \pm 0.006 \ \pm 0.002$	<sup>5</sup> ALBRECHT	90н ARG	$e^+e^-  ightarrow ~\Upsilon(4S)$
$0.117 \ \pm 0.004 \ \pm 0.010$	<sup>6</sup> WACHS	89 CBAL	Direct $e$ at $\Upsilon(4S)$
$0.120 \ \pm 0.007 \ \pm 0.005$	CHEN	84 CLEO	Direct $e$ at $\Upsilon(4S)$
$\bullet$ $\bullet$ $\bullet$ We do not use the following	data for averages,	, fits, limits,	etc. ● ● ●
$0.132 \ \pm 0.008 \ \pm 0.014$	<sup>7</sup> KLOPFEN	83B CUSB	Direct $e$ at $\Upsilon(4S)$

 $^{2}$  BARISH 96B analysis performed using tagged semileptonic decays of the *B*. This technique is almost model independent for the lepton branching ratio.

<sup>3</sup>ALBRECHT 93H analysis performed using tagged semileptonic decays of the *B*. This technique is almost model independent for the lepton branching ratio.

- <sup>4</sup> YANAGISAWA 91 also measures an average semileptonic branching ratio at the  $\Upsilon(5S)$  of 9.6–10.5% depending on assumptions about the relative production of different *B* meson species.
- $^5$  ALBRECHT 90H uses the model of ALTARELLI 82 to correct over all lepton momenta. 0.099  $\pm$  0.006 is obtained using ISGUR 89B.
- <sup>6</sup> Using data above p(e) = 2.4 GeV, WACHS 89 determine  $\sigma(B \rightarrow e\nu \text{up})/\sigma(B \rightarrow e\nu \text{charm}) < 0.065 \text{ at } 90\%$  CL.

<sup>7</sup>Ratio  $\sigma(b \rightarrow e\nu up)/\sigma(b \rightarrow e\nu charm) < 0.055$  at CL = 90%.

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

Г<sub>3</sub>/Г

These branching fraction values are model dependent. See the note on "Semileptonic Decays of *B* Mesons at the beginning of the  $B^+$  Particle Listings.

VALUE	DOCUMENT ID	TECN	COMMENT
The data in this block is included in	the average printed	for a prev	vious datablock.

#### 0.103±0.005 OUR AVERAGE

$0.100\!\pm\!0.006\!\pm\!0.002$	<sup>8</sup> ALBRECHT	90н ARG	$e^+e^- \rightarrow \Upsilon(4S)$
$0.108\!\pm\!0.006\!\pm\!0.01$	CHEN	84 CLEO	Direct $\mu$ at $\Upsilon(4S)$
$0.112\!\pm\!0.009\!\pm\!0.01$	LEVMAN	84 CUSB	Direct $\mu$ at $\Upsilon(4S)$

<sup>8</sup> ALBRECHT 90H uses the model of ALTARELLI 82 to correct over all lepton momenta. 0.097  $\pm$  0.006 is obtained using ISGUR 89B.

$\Gamma(\overline{p}e^+\nu_e \text{ anything})/\Gamma$	total					$\Gamma_2/\Gamma$
VALUE	CL%	DOCUMENT ID		TECN	COMMENT	
<0.0016	90	ALBRECHT	90H	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\Gamma(D^{-}\ell^{+}\nu_{\ell} \text{ anything}))$ $\ell = e \text{ or } \mu.$	/ <b>Γ</b> (ℓ+	$\nu_\ell$ anything)				$\Gamma_5/\Gamma_4$
VALUE		DOCUMENT ID		TECN	COMMENT	
0.26±0.07±0.04		<sup>9</sup> FULTON	91	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
<sup>9</sup> FULTON 91 uses B( <i>D</i>	$^{+} \rightarrow$	$K^{-}\pi^{+}\pi^{+}) = (9.1\pm$	1.3	±0.4)%	as measured	by MARK III.
$\Gamma(\overline{D}^{0}\ell^{+}\nu_{\ell} \text{ anything})/\ell = e \text{ or } \mu.$	′Γ <b>(</b> ℓ <sup>+</sup>	$ u_{\ell}$ anything)				Γ <sub>6</sub> /Γ <sub>4</sub>
VALUE		DOCUMENT ID		TECN	<u>COMMENT</u>	
$0.67 {\pm} 0.09 {\pm} 0.10$		<sup>10</sup> FULTON	91	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$^{10}$ FULTON 91 uses B( $L$	$D^0 \rightarrow$	$K^{-}\pi^{+}) = (4.2 \pm 0.01)$	).4 ±	0.4)%	as measured	by MARK III.
$\Gamma(D^{*-}\ell^+\nu_\ell \text{ anything})$	)/Γ <sub>tot</sub>	al				Г <sub>7</sub> /Г
VALUE (units $10^{-2}$ )		DOCUMENT ID		TECN	COMMENT	
$\bullet \bullet \bullet$ We do not use the	follow	ing data for averages	, fits	, limits,	etc. • • •	
$0.6 \pm 0.3 \pm 0.1$		<sup>11</sup> BARISH	95	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$

<sup>11</sup> 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)%.

$\Gamma(D^{*0}\ell^+\nu_\ell \text{ anything})/\Gamma_{\text{total}}$				Г <sub>8</sub> /Г
VALUE (units $10^{-2}$ )	DOCUMENT ID	TECN	COMMENT	
$\bullet \bullet \bullet$ We do not use the following	ng data for averages, fit	s, limits,	etc. • • •	
$0.6 {\pm} 0.6 {\pm} 0.1$	<sup>12</sup> BARISH 95	CLE2	$e^+e^-  ightarrow \gamma$	(4 <i>S</i> )
$^{12}$ BARISH 95 use B( $D^0  ightarrow K$ (68.1 $\pm$ 1.0 $\pm$ 1.3)%, B( $D^{*0}$	$(2^{-}\pi^{+}) = (3.91 \pm 0.08)$ $(2^{-} \rightarrow D^{0}\pi^{0}) = (63.6 \pm 10)$	$\pm 0.17)^{6}$	%, B( $D^{*+} \rightarrow$ .3)%.	$D^{0}\pi^{+}) =$
$\Gamma(\overline{D}^{**}\ell^+\nu_\ell)/\Gamma_{total}$				٦/٩
$D^{**}$ stands for the sum o	f the $D(1  {}^1\!P_1)$ , $D(1  {}^3\!P_1)$	$P_0$ ), $D(1^{\frac{1}{2}})$	$^{3}P_{1}$ ), $D(1  {}^{3}P_{2})$	, $D(2^{1}S_{0})$ ,
and $D(2^{1}S_{1})$ resonances.	$\ell = e$ or $\mu$ , not sum	over e ar	id $\mu$ modes.	Ū
VALUE <u>CL%</u>	<u>EVTS</u> <u>DOCUMEN</u>	T ID	TECN COM	MENT
0.027±0.005±0.005	63 <sup>13</sup> ALBRECH	HT 93	ARG $e^+e$ $\gamma$	(4S)
• • • We do not use the following	ng data for averages, fit	s, limits,	etc. • • •	
<0.028 95	<sup>14</sup> BARISH	95	CLE2 $e^+e$ $\gamma$	(4S)
68.1%, B( $D^0 \rightarrow K^- \pi^+$ )	$= 3.65\%, B(D^0 \rightarrow k)$	$(-\pi^+\pi^-)$	$(D^+ \rightarrow \pi^+) = 7.5\%$	. We have
<sup>14</sup> BARISH 95 use $B(D^0 \rightarrow K$ channels are zero, and use $G$ $\Gamma(\overline{D}_1(2420)\ell^+ \nu_\ell \text{ anything})/$	$(\pi^{-}\pi^{+}) = (3.91 \pm 0.08)$ SW model for relative a $(\Gamma_{total})$	$\pm$ 0.17) <sup>o</sup> abundanc	%, assume all r ces of <i>D</i> ** state	oonresonant es. <b>F<sub>10</sub>/F</b>
<sup>14</sup> BARISH 95 use $B(D^0 \rightarrow K$ channels are zero, and use $GI$ $\Gamma(\overline{D}_1(2420)\ell^+\nu_\ell \text{ anything})/\frac{VALUE}{2}$	$(-\pi^+) = (3.91 \pm 0.08)$ SW model for relative a $(\Gamma_{total})$	± 0.17) <sup>6</sup> abundanc <u>TECN</u>	%, assume all r ces of <i>D</i> ** state	ionresonant es. <b>F<sub>10</sub>/F</b>
taken their average $e$ and $\mu$ (14 BARISH 95 use $B(D^0 \rightarrow K$ channels are zero, and use $GI$ $\Gamma(\overline{D}_1(2420)\ell^+ \nu_\ell \text{ anything})/\frac{VALUE}{0.0074\pm0.0016}$	$(-\pi^+) = (3.91 \pm 0.08)$ SW model for relative a $(\Gamma_{total})$ 15 BUSKULIC 976 BUSKULIC 976	± 0.17) <sup>(</sup> abundanc <u>TECN</u> B ALEP	%, assume all r ces of $D^{**}$ state $\frac{COMMENT}{e^+e^- \rightarrow Z}$	oonresonant es. Γ <sub>10</sub> /Γ
<sup>14</sup> BARISH 95 use $B(D^0 \rightarrow K$ channels are zero, and use GI $\Gamma(\overline{D}_1(2420)\ell^+\nu_\ell \text{ anything})/VALUE$ 0.0074±0.0016 ••• We do not use the following	$(-\pi^+) = (3.91 \pm 0.08)$ SW model for relative a $(\Gamma_{total})$ 15 BUSKULIC 97E ng data for averages, fit 16 BUSKULIC 97E	± 0.17) <sup>6</sup> abundanc <u>TECN</u> B ALEP s, limits,	%, assume all r tes of $D^{**}$ state $\frac{COMMENT}{e^+e^- \rightarrow Z}$ etc. • • •	Fight of the second of the se
<sup>14</sup> BARISH 95 use $B(D^0 \rightarrow K$ channels are zero, and use GI $\Gamma(\overline{D}_1(2420)\ell^+\nu_\ell \text{ anything})/\frac{VALUE}{0.0074\pm0.0016}$ • • We do not use the following seen <sup>15</sup> BUSKIUUC 07B accuracy B(I	$(-\pi^+) = (3.91 \pm 0.08)$ SW model for relative a $(\Gamma_{total})$ 15 BUSKULIC 976 g data for averages, fit 16 BUSKULIC 956 $(2420) \rightarrow D^*\pi) = 1$	$\pm$ 0.17) <sup>6</sup> abundance <u>TECN</u> B ALEP s, limits, B ALEP	%, assume all r res of $D^{**}$ state $\frac{COMMENT}{e^+e^- \rightarrow Z}$ etc. • • Repl. by BUS	KULIC 97B
<sup>14</sup> BARISH 95 use $B(D^0 \rightarrow K$ channels are zero, and use GI $\Gamma(\overline{D}_1(2420)\ell^+ \nu_\ell \text{ anything})/VALUE$ 0.0074±0.0016 ••• We do not use the following seen <sup>15</sup> BUSKULIC 97B assumes $B(L)$ and $B(b \rightarrow B) = 0.378 \pm 0$	$\pi^{-}\pi^{+}$ ) = (3.91 ± 0.08 SW model for relative a $\pi^{-}\pi^{+}$ ) = (3.91 ± 0.08 SW model for relative a $\pi^{-}\pi^{+}$ ) = (3.91 ± 0.08 $D_{0}CUMENT ID$ 15 BUSKULIC 97 15 BUSKULIC 97 16 BUSKULIC 95 $D_{1}(2420) \rightarrow D^{*}\pi$ ) = (3.91 ± 0.08) 0.022.	$\pm$ 0.17) <sup>6</sup> abundance <u>TECN</u> B ALEP s, limits, B ALEP 1, B( $D_1$ (	%, assume all r res of $D^{**}$ state $\frac{COMMENT}{e^+e^- \rightarrow Z}$ etc. • • • Repl. by BUS 2420) $\rightarrow D^*\tau$	KULIC 97B $r^{\pm}$ ) = 2/3,
14 BARISH 95 use $B(D^0 \rightarrow K)$ channels are zero, and use GI $\Gamma(\overline{D}_1(2420)\ell^+ \nu_\ell \text{ anything})/\frac{VALUE}{0.0074\pm0.0016}$ ••• We do not use the following seen 15 BUSKULIC 97B assumes $B(D)$ and $B(b \rightarrow B) = 0.378 \pm 0$ 16 BUSKULIC 95B reports $f_B \rightarrow \overline{D}^*(2010)^- \pi^+) = (2.04 \pm 0)$ a single <i>B</i> charge state.	$(-\pi^+) = (3.91 \pm 0.08)$ (SW model for relative a) $(-\pi^+) = (3.91 \pm 0.08)$ (SW model for relative a) $(-\pi^+) = (-\pi^+)^{-1}$ $(-\pi^+) = (-\pi^+)^{-$	$\pm 0.17)^{\circ}$ abundance B ALEP s, limits, B ALEP 1, B( $D_1$ ( $c_{\ell}^{+} \nu_{\ell}$ any any $f_B$ is $c_{\ell}^{-}$	%, assume all r tes of $D^{**}$ state $\frac{COMMENT}{e^+e^- \rightarrow Z}$ etc. • • • Repl. by BUS 2420) $\rightarrow D^*\tau$ thing) $\times B(\overline{D}_1$ the production	tionresonant es. $\Gamma_{10}/\Gamma$ $KULIC 97B$ $T^{\pm}) = 2/3,$ $(2420)^{0} \rightarrow$ fraction for
14 BARISH 95 use $B(D^0 \rightarrow K)$ channels are zero, and use GI $\Gamma(\overline{D}_1(2420)\ell^+\nu_\ell \text{ anything})/\nu_{ALUE}$ 0.0074±0.0016 • • We do not use the following seen 15 BUSKULIC 97B assumes $B(D)$ and $B(b \rightarrow B) = 0.378 \pm 0$ 16 BUSKULIC 95B reports $f_B \rightarrow \overline{D}^*(2010)^-\pi^+) = (2.04 \pm 0)$ a single <i>B</i> charge state. $\Gamma(D\pi\ell^+\nu_\ell \text{ anything}) + \Gamma(\ell)$	$\pi^{+}$ = (3.91 ± 0.08 SW model for relative a $\pi^{+}$ = (3.91 ± 0.08 SW model for relative a $\pi^{-}\pi^{+}$ = (3.91 ± 0.08 $D_{1}(2420)$ for relative a $\pi^{-}\pi^{-}\pi^{-}\pi^{-}\pi^{-}\pi^{-}\pi^{-}\pi^{-}$	$\pm 0.17)^{\circ}$ abundance B ALEP s, limits, B ALEP 1, B( $D_1$ ( $e^+ \nu_{\ell}$ any there $f_B$ is $\Phi$	%, assume all r tes of $D^{**}$ state $\frac{COMMENT}{e^+e^- \rightarrow Z}$ etc. • • Repl. by BUS 2420) $\rightarrow D^*\tau$ thing) $\times B(\overline{D}_1$ the production	Function for $\Gamma_{11}/\Gamma$ KULIC 97B $r^{\pm}) = 2/3,$ $(2420)^0 \rightarrow$ fraction for $\Gamma_{11}/\Gamma$
taken their average e and $\mu$ ( <sup>14</sup> BARISH 95 use $B(D^0 \rightarrow K)$ channels are zero, and use GI $\Gamma(\overline{D}_1(2420)\ell^+ \nu_\ell \text{ anything})/\frac{VALUE}{2}$ 0.0074±0.0016 ••• We do not use the following seen <sup>15</sup> BUSKULIC 97B assumes $B(L)$ and $B(b \rightarrow B) = 0.378 \pm 0$ <sup>16</sup> BUSKULIC 95B reports $f_B > \overline{D}^*(2010)^- \pi^+) = (2.04 \pm 0)$ a single <i>B</i> charge state. $[\Gamma(D\pi\ell^+\nu_\ell \text{ anything}) + \Gamma(\ell)]$ VALUE	$\pi^{+}$ = (3.91 ± 0.08 (SW model for relative a) (F <sub>total</sub> 15 BUSKULIC 976 16 BUSKULIC 976 16 BUSKULIC 956 $D_1(2420) \rightarrow D^* \pi) = 3$ $D_22$ $\langle B(B \rightarrow \overline{D}_1(2420)^0 \ell)$ $D_58 \pm 0.34)10^{-3}$ , whe D* $\pi \ell^+ \nu_{\ell}$ anything) <u>DOCUMENT ID</u> 17 DUCKULIC 976	$\pm 0.17)^{\circ}$ abundance $\frac{TECN}{B} \text{ ALEP}$ s, limits, B ALEP 1, B(D <sub>1</sub> () $\frac{1}{2} + \nu_{\ell} \text{ any:}$ is f b is f $\frac{\Gamma CN}{B} = \frac{TECN}{B}$	%, assume all r tes of $D^{**}$ state $\frac{COMMENT}{e^+e^- \rightarrow Z}$ etc. ● ● Repl. by BUS 2420) → $D^*\tau$ thing) × B( $\overline{D}_1$ the production $\frac{COMMENT}{e^+e^-}$	Find the set of the s
14 BARISH 95 use $B(D^0 \rightarrow K)$ channels are zero, and use GI $\Gamma(\overline{D}_1(2420)\ell^+\nu_\ell \text{ anything})/VALUE$ 0.0074±0.0016 • • We do not use the following seen 15 BUSKULIC 97B assumes $B(D)$ and $B(b \rightarrow B) = 0.378 \pm 0$ 16 BUSKULIC 95B reports $f_B > \overline{D}^*(2010)^-\pi^+) = (2.04 \pm 0)$ a single <i>B</i> charge state. $[\Gamma(D\pi\ell^+\nu_\ell \text{ anything}) + \Gamma(\ell)]$ <i>VALUE</i> 0.0226±0.0029±0.0033	$\pi^{+}$ = (3.91 ± 0.08 SW model for relative a $\pi^{+}$ = (3.91 ± 0.08 SW model for relative a $\pi^{-} \pi^{+}$ = (3.91 ± 0.08 $\pi^{-} \pi^{+}$ ) = (3.91 ± 0.08 $D_{10}^{-} 0.02$ $\pi^{-} \pi^{-} \nu_{\ell} \text{ anything}$ $D^{+} \pi^{+} \nu_{\ell} \text{ anything}$ $D^{-} \pi^{-} \mu_{\ell} \nu_{\ell} \text{ anything}$ $D^{-} \pi^{-} \mu_{\ell} \nu_{\ell} \text{ anything}$	$\pm 0.17)^{\circ}$ abundance B ALEP s, limits, B ALEP 1, B( $D_1$ ( $e^+ v_{\ell}$ any the $f_B$ is $re f_B$ is $\frac{\Gamma ECN}{B}$ B ALEP	%, assume all r tes of $D^{**}$ state $\frac{COMMENT}{e^+e^- \rightarrow Z}$ etc. • • Repl. by BUS 2420) $\rightarrow D^*\tau$ thing) $\times B(\overline{D}_1)$ the production $\frac{COMMENT}{e^+e^- \rightarrow Z}$	tionresonant es. $\Gamma_{10}/\Gamma$ $KULIC 97B$ $r^{\pm}) = 2/3,$ $(2420)^{0} \rightarrow$ fraction for $\Gamma_{11}/\Gamma$
14 BARISH 95 use $B(D^0 \rightarrow K)$ channels are zero, and use GI $\Gamma(\overline{D}_1(2420)\ell^+\nu_\ell \text{ anything})/\frac{VALUE}{0.0074\pm0.0016}$ ••• We do not use the following seen 15 BUSKULIC 97B assumes $B(L)$ and $B(b \rightarrow B) = 0.378 \pm 0$ 16 BUSKULIC 95B reports $f_B \rightarrow \overline{D}^*(2010)^-\pi^+) = (2.04 \pm 0)$ a single <i>B</i> charge state. $[\Gamma(D\pi\ell^+\nu_\ell \text{ anything}) + \Gamma(\ell)]$ <i>VALUE</i> 0.0226±0.0029±0.0033 17 BUSKULIC 97B assumes $B(L)$ assuming that all observed $D$	$\pi^{+}$ = (3.91 ± 0.08 (SW model for relative a) (F <sub>total</sub> 15 BUSKULIC 976 16 BUSKULIC 976 16 BUSKULIC 956 $D_1(2420) \rightarrow D^* \pi) = 3$ $D_22$ . $\langle B(B \rightarrow \overline{D}_1(2420)^0 \ell)$ $D_58 \pm 0.34)10^{-3}$ , whe $D^* \pi \ell^+ \nu_{\ell} \text{ anything}$ $D_{T} BUSKULIC 976$ $D \rightarrow B$ = 0.378 ± 0. $D_{T} \mu^+ D^+ - \mu^+$	$\pm 0.17)^{\circ}$ abundance B ALEP s, limits, B ALEP 1, B( $D_1($ $t^+ v_{\ell} any$ re $f_B$ is $t^-$ $\frac{f_{total}}{t_{total}}$ B ALEP 022 and $D^{*}$	%, assume all r tes of $D^{**}$ state $\frac{COMMENT}{e^+e^- \rightarrow Z}$ etc. • • • Repl. by BUS 2420) → $D^*\tau$ thing) × B( $\overline{D}_1$ the production $\frac{COMMENT}{e^+e^- \rightarrow Z}$ uses isospin in $\pm \pi^-$ are from	tionresonant es. $\Gamma_{10}/\Gamma$ $KULIC 97B$ $r^{\pm}) = 2/3,$ $(2420)^{0} \rightarrow$ fraction for $\Gamma_{11}/\Gamma$ variance by D** states
14 BARISH 95 use $B(D^0 \rightarrow K)$ channels are zero, and use GI $\Gamma(\overline{D}_1(2420)\ell^+\nu_\ell \text{ anything})/VALUE$ 0.0074±0.0016 • • We do not use the following seen 15 BUSKULIC 97B assumes $B(D)$ and $B(b \rightarrow B) = 0.378 \pm 00$ 16 BUSKULIC 95B reports $f_B \rightarrow \overline{D}^*(2010)^-\pi^+) = (2.04 \pm 00)$ a single <i>B</i> charge state. $[\Gamma(D\pi\ell^+\nu_\ell \text{ anything}) + \Gamma(\ell))$ <i>VALUE</i> 0.0226±0.0029±0.0033 17 BUSKULIC 97B assumes $B(D)$ assuming that all observed $D^0$ A correction has been applied	$\pi^{+}$ = (3.91 ± 0.08 SW model for relative a ( $\Gamma_{total}$ DOCUMENT ID 15 BUSKULIC 976 and data for averages, fit 16 BUSKULIC 956 $D_1(2420) \rightarrow D^*\pi$ ) = 3 $D_1(2420) \rightarrow D^*\pi$ ) = 3 $D_1(2420) \rightarrow D^*\pi$ ) = 3 $D_1(2420) \rightarrow D^*\pi$ ) = 3 $D_1(2420)^0 \ell$ $D_2(2420)^0 \ell$ $D_3(2420)^0 \ell$ $D_$	$\pm 0.17)^{\circ}$ abundance B ALEP s, limits, B ALEP 1, B( $D_1$ ( $c^+ v_{\ell}$ any cre $f_B$ is ${\Gamma total}$ B ALEP 022 and , and $D^*$	$C_{0}$ , assume all r tess of $D^{**}$ state $C_{0}$ assume all r $e^+e^- \rightarrow Z$ etc. • • Repl. by BUS 2420) → $D^* \tau$ thing) × B( $\overline{D}_1$ the production $C_{0}$ and $\overline{D}_1$ $e^+e^- \rightarrow Z$ uses isospin in $+\pi^-$ are from of $B^0$ and $A^0$ .	honresonant es. $\Gamma_{10}/\Gamma$ $KULIC 97B$ $r^{\pm}) = 2/3,$ $(2420)^{0} \rightarrow$ fraction for $\Gamma_{11}/\Gamma$ variance by D** states.

$\Gamma(\overline{D}^{*}(2460)) \ell^{+} \mu$	anything)	/Г Гла/
	(1%) (1%)	IZ/
<0.0065	<u>95</u>	<sup>18</sup> BUSKULIC 97B ALEP $e^+e^- \rightarrow Z$
• • • We do not us	e the following	ng data for averages, fits, limits, etc. • • •
not seen		<sup>19</sup> BUSKULIC 95B ALEP $e^+e^- \rightarrow Z$
<sup>18</sup> A revised numb	er based on E	BUSKULIC 97B which assumes $B(D_2^*(2460) \rightarrow D^* \pi^{\pm})$ :
0.20 and B( <i>b</i> —	(B) = 0.378	8 ± 0.022.
<sup>19</sup> BUSKULIC 95B	reports $f_B$ >	$ imes$ B( $B  o ~\overline{D}_2^*$ (2460) $^0 \ell^+  u_\ell$ anything) $ imes$ B( $\overline{D}_2^*$ (2460) $^0$ -
$\overline{D}^*(2010)^-\pi^+)$ single <i>B</i> charge	$) \leq 0.81  imes 10$ state.	$0^{-3}$ at CL=95%, where $f_B$ is the production fraction for
$\Gamma(D^{*-}\pi^+\ell^+\nu_{\ell}a)$	nvthing)/[	- ταταί Γ12/
Includes resor	ant and non	resonant contributions.
VALUE (units $10^{-3}$ )	<u> </u>	DOCUMENT ID TECN COMMENT
$10.0 \pm 2.7 \pm 2.1$		<sup>20</sup> BUSKULIC 95B ALEP $e^+e^- \rightarrow Z$
<sup>20</sup> BUSKULIC 95B	reports $f_B$ >	$\times$ B( $B \rightarrow \overline{D}^*(2010)^- \pi^+ \ell^+  u_\ell$ anything) = (3.7 $\pm$ 1.0 $\pm$
0.7)10 <sup>-3</sup> . Abov	ve value assur	mes $f_B = 0.37 \pm 0.03$ .
	:	<b>F</b> . /
$U_s \ell v_\ell$ anytn	ing)/I total	
	00	$\frac{DOCOMENT TD}{21} \text{ AL RECHT} \qquad 025 \text{ APC}  a^+ a^- \rightarrow \Upsilon(AS)$
	90	ALDRECHT 95E ANG $e^+e^- \rightarrow T(43)$
ALBRECHT 93	reports < 0	$(0.012 \text{ for B}(D_s^+ \rightarrow \phi \pi^+) = 0.027. \text{ VVe rescale to our bes})$
value $B(D_{s}^{+} \rightarrow$	$\phi\pi^{+}) = 0.0$	036.
$\Gamma(D^{-}\ell^{+}\nu_{\ell}K^{+})$	nything)/C	пала Гля/
VALUE	CL%	DOCUMENT ID TECN COMMENT
<0.006	90	<sup>22</sup> ALBRECHT 93E ARG $e^+e^- \rightarrow \Upsilon(4S)$
22 ALBRECHT 03	= reports < N	$0.008$ for B( $D^+ \rightarrow \phi \pi^+$ ) = 0.027. We rescale to our be
$relue P(D^+)$	(4-+) = 0	$\varphi_s = 0.021$ . We rescale to our beside
value $D(D_s \rightarrow s)$	$\varphi \pi + j = 0.0$	050.
$\Gamma(D^\ell^+ \nu_\ell K^0)$ ar	$v_{thing})/\Gamma_{t}$	rotal Γ16/
VALUE	<u>CL%</u>	DOCUMENT ID TECN COMMENT
<0.009	90	$^{23}$ ALBRECHT 93E ARG $e^+e^-  ightarrow argama(4S)$
23 ALBRECHT 93	E reports < 0	0.012 for B( $D^+ \rightarrow \phi \pi^+$ ) = 0.027. We rescale to our be
value B( $D^+ \rightarrow$	$(\phi \pi^+) = 0.0$	036.
value $D(D_s)$	$\varphi \pi = 0.$	
$\Gamma(\ell^+  u_\ell$ noncharn	$red)/\Gamma(\ell^+)$	$\nu_{\ell}$ anything) $\Gamma_{17}/\Gamma$
$\ell$ denotes $e$ o	r $\mu$ , not the	sum. These experiments measure this ratio in very limite
momentum ir VALUE	tervals. 2L% EVTS	DOCUMENT ID TECN COMMENT
<u> </u>		$24 \text{ ALBRECHT} \qquad 946 \text{ ARG} \qquad e^+e^- \rightarrow \gamma(4S)$

 $\begin{array}{rcl} 2^{4} & \text{ALBRECHT} & 94\text{C} & \text{ARG} & e^{+} e^{-} \rightarrow & I \ (4S) \\ 2^{5} & \text{BARTELT} & 93\text{B} & \text{CLE2} & e^{+} e^{-} \rightarrow & \Upsilon(4S) \\ 2^{6} & \text{ALBRECHT} & 91\text{C} & \text{ARG} & e^{+} e^{-} \rightarrow & \Upsilon(4S) \\ 2^{7} & \text{FULTON} & 90 & \text{CLEO} & e^{+} e^{-} \rightarrow & \Upsilon(4S) \end{array}$ 107 77 76

 $\bullet$   $\bullet$   $\bullet$  We do not use the following data for averages, fits, limits, etc.  $\bullet$   $\bullet$ 

		41	<sup>28</sup> ALBRECHT	90	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
<0.04	90		<sup>29</sup> BEHRENDS	87	CLEO	$e^+e^-  ightarrow$	$\Upsilon(4S)$
<0.04	90		CHEN	84	CLEO	Direct <i>e</i> at	$\Upsilon(4S)$
<0.055	90		KLOPFEN	<b>83</b> B	CUSB	Direct e at	$\Upsilon(4S)$

<sup>24</sup> ALBRECHT 94C find  $\Gamma(b \rightarrow c)/\Gamma(b \rightarrow all) = 0.99 \pm 0.02 \pm 0.04$ .

<sup>25</sup> BARTELT 93B (CLEO II) measures an excess of  $107 \pm 15 \pm 11$  leptons in the lepton momentum interval 2.3–2.6 GeV/*c* which is attributed to  $b \rightarrow u \ell \nu_{\ell}$ . This corresponds to a model-dependent partial branching ratio  $\Delta B_{ub}$  between  $(1.15 \pm 0.16 \pm 0.15) \times 10^{-4}$ , as evaluated using the KS model (KOERNER 88), and  $(1.54 \pm 0.22 \pm 0.20) \times 10^{-4}$  using the ACCMM model (ARTUSO 93). The corresponding values of  $|V_{ub}|/|V_{cb}|$  are 0.056  $\pm$  0.006 and 0.076  $\pm$  0.008, respectively.

<sup>26</sup> ALBRECHT 91C result supersedes ALBRECHT 90. Two events are fully reconstructed providing evidence for the  $b \rightarrow u$  transition. Using the model of ALTARELLI 82, they obtain  $|V_{ub}/V_{cb}| = 0.11 \pm 0.012$  from 77 leptons in the 2.3–2.6 GeV momentum range.

<sup>27</sup> FULTON 90 observe 76 ± 20 excess e and  $\mu$  (lepton) events in the momentum interval p = 2.4-2.6 GeV signaling the presence of the  $b \rightarrow u$  transition. The average branching ratio,  $(1.8 \pm 0.4 \pm 0.3) \times 10^{-4}$ , corresponds to a model-dependent measurement of approximately  $|V_{u\,b}/V_{c\,b}| = 0.1$  using B( $b \rightarrow c \ell \nu$ ) = 10.2 ± 0.2 ± 0.7%.

- <sup>28</sup> ALBRECHT 90 observes 41 ± 10 excess *e* and  $\mu$  (lepton) events in the momentum interval p = 2.3-2.6 GeV signaling the presence of the  $b \rightarrow u$  transition. The events correspond to a model-dependent measurement of  $|V_{ub}/V_{cb}| = 0.10 \pm 0.01$ .
- <sup>29</sup> The quoted possible limits range from 0.018 to 0.04 for the ratio, depending on which model or momentum range is chosen. We select the most conservative limit they have calculated. This corresponds to a limit on  $|V_{ub}|/|V_{cb}| < 0.20$ . While the endpoint technique employed is more robust than their previous results in CHEN 84, these results do not provide a numerical improvement in the limit.

### $\Gamma(K^+\ell^+\nu_\ell \text{ anything})/\Gamma(\ell^+\nu_\ell \text{ anything})$

$\iota$ denotes e or $\mu$ , not the s	buill.			
VALUE	DOCUMENT ID	TECN	COMMENT	
0.58 $\pm$ 0.05 OUR AVERAGE				
$0.594 \!\pm\! 0.021 \!\pm\! 0.056$	ALBRECHT	94c ARG	$e^+e^-  ightarrow ~\Upsilon(4S)$	
$0.54 \pm 0.07 \pm 0.06$	<sup>30</sup> ALAM	87b CLEO	$e^+e^- \rightarrow \Upsilon(4S)$	
<b>AA</b>				

<sup>30</sup> ALAM 87B measurement relies on lepton-kaon correlations.

## $\Gamma(K^{-}\ell^{+}\nu_{\ell} \text{ anything})/\Gamma(\ell^{+}\nu_{\ell} \text{ anything})$

$\iota$ denotes e or $\mu$ , not the st				
VALUE	DOCUMENT ID	TECN	COMMENT	
$0.092 \pm 0.035$ OUR AVERAGE				
$0.086 \!\pm\! 0.011 \!\pm\! 0.044$	ALBRECHT	94c ARG	$e^+e^-  ightarrow ~ \Upsilon(4S)$	
$0.10 \pm 0.05 \pm 0.02$	<sup>31</sup> ALAM	87b CLEO	$e^+e^-  ightarrow ~ \Upsilon(4S)$	

<sup>31</sup> ALAM 87B measurement relies on lepton-kaon correlations.

$\Gamma(K^0/\overline{K}^0\ell^+\nu_\ell)$ anything	$)/\Gamma(\ell^+  u_\ell$ anything)			Γ <sub>20</sub> /Γ <sub>4</sub>
$\ell$ denotes $e$ or $\mu$ , not t	he sum. Sum over $K^{\dot{0}}$	and $\overline{K}^0$ state	s.	
VALUE	DOCUMENT ID	TECN	COMMENT	
0.42 $\pm 0.05$ OUR AVERAG	E			
$0.452\!\pm\!0.038\!\pm\!0.056$	<sup>32</sup> ALBRECHT	94c ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$0.39 \ \pm 0.06 \ \pm 0.04$	<sup>33</sup> ALAM	87b CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
<sup>32</sup> ALBRECHT 94C assume	a $K^0/\overline{K}^0$ multiplicity	twice that of	$K^0_{S}$ .	
<sup>33</sup> ALAM 87B measurement	relies on lepton-kaon o	correlations.	5	

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 $\Gamma_{18}/\Gamma_4$ 

 $\Gamma_{19}/\Gamma_4$ 

VALUE	DOCUMENT ID	TECN	COMMENT	
$1.10 \pm 0.05$	<sup>34</sup> GIBBONS	97b CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
• • We do not use the follo	owing data for averages,	fits, limits	, etc. • • •	
$0.98\!\pm\!0.16\!\pm\!0.12$	<sup>35</sup> ALAM	87b CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
<sup>34</sup> GIBBONS 97B from charn	n counting using $B(D_{a}^{+})$ -	$\rightarrow \phi \pi = 0$	$0.036 \pm 0.009$	) and B( $\Lambda^+_{-} \rightarrow$
$pK^{-}\pi^{+}) = 0.044 \pm 0.000$	06			× C
<sup>35</sup> From the difference betw lepton-kaon correlations. thus removed it from the	een $K^-$ and $K^+$ widths It does not consider the average.	s. ALAM e possibilit	87B measure y of <i>BB</i> mix	ment relies on king. We have
$\Gamma(D^{\pm}$ anything)/ $\Gamma_{ ext{total}}$				$\Gamma_{21}/\Gamma$
<u>VALUE EVT</u> 0.241±0.019 OUR AVERAGE	<u>S</u> <u>DOCUMENT ID</u>	TECN	<u>COMMENT</u>	
$0.240 \pm 0.013 {+0.015 \atop -0.016}$	<sup>36</sup> GIBBONS	97в CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$0.25 \pm 0.04 \pm 0.02$	37 BORTOLETTO	92 CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$0.23 \pm 0.05 \ +0.01 \ -0.02$	<sup>38</sup> ALBRECHT	91h ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
<ul> <li>• • We do not use the following the following</li></ul>	owing data for averages,	fits, limits	, etc. • • •	
$0.21 \pm 0.05 \pm 0.01$ 204	k <sup>39</sup> BORTOLETTO	87 CLEO	Sup. by BO	ORTO-
$0.0008 \pm 0.00082$ . We div $10^{-2}$ . Our first error is t error from using our best 37  BORTOLETTO 92 report: $0.0030 \pm 0.0018$ . We divi $10^{-2}$ . Our first error is t error from using our best 38  ALBRECHT 91H reports [ $0.0027 \pm 0.0040$ . We divi $10^{-2}$ . Our first error is t error from using our best 39  BORTOLETTO 87 report $0.004 \pm 0.002$ . We divide Our first error is their expension of the second secon	vide by our best value B( their experiment's error a value. s $[B(B \rightarrow D^{\pm} \text{ anything})]$ ide by our best value B( $I$ their experiment's error a value. $[B(B \rightarrow D^{\pm} \text{ anything}) >$ ide by our best value B( $I$ their experiment's error a value. ss $[B(B \rightarrow D^{\pm} \text{ anything})]$ by our best value B( $D^{\pm}$ eriment's error and our se	$\begin{array}{l} (D^+ \rightarrow K) \\ \text{and our sec} \\ \times B(D^+ \rightarrow K) \\ D^+ \rightarrow K) \\ \text{and our sec} \\ \times B(D^+ \rightarrow K) \\ D^+ \rightarrow K) \\ \text{and our sec} \\ 0 \times B(D^+ \rightarrow K) \\ \rightarrow K^- \pi^+ \\ \text{econd error} \end{array}$	$ = \pi^{+} \pi^{+} = $ cond error is $ = K^{-} \pi^{+} \pi^{+} = $ (9.0) is the system	$(9.0 \pm 0.6) \times$ the systematic $(9.0 \pm 0.6) \times$ $(9.0 \pm 0.6) \times$ the systematic $(9.0 \pm 0.6) \times$ $(9.0 \pm 0.6) \times$ the systematic $(9.0 \pm 0.6) \times$ the systematic $(9.0 \pm 0.6) \times 10^{-2}$ atic error from
$\Gamma(D^0/\overline{D}^0 \text{ anything})/\Gamma_{\text{tot}}$	al			Г <sub>22</sub> /Г
VALUE EVT.	<u>S</u> <u>DOCUMENT ID</u>	TECN	<u>COMMENT</u>	
$1 621 \pm 0.000$ (11D AVEDACE	= ⊑rror includes scale fa		L.	
0.631±0.029 OUR AVERAGE	40 CIBRONS			$\Upsilon(45)$
<b>0.631±0.029 OUR AVERAGE</b> 0.651±0.025±0.015 0.60 ±0.05 +0.01	<sup>40</sup> GIBBONS <sup>41</sup> BORTOI FTTO	97B CLE2 92 CLEO	$e^+e^- \rightarrow e^+e^- \rightarrow$	$\Upsilon(4S)$ $\Upsilon(4S)$
<b>0.631±0.029 OUR AVERAGE</b> 0.651±0.025±0.015 0.60 ±0.05 ±0.01 0.50 ±0.08 ±0.01	<sup>40</sup> GIBBONS <sup>41</sup> BORTOLETTO <sup>42</sup> ALBRECHT	97B CLE2 92 CLEO 91H ARG	$e^+e^- \rightarrow e^+e^- \rightarrow e^+e^- \rightarrow$	$\Upsilon(4S)$ $\Upsilon(4S)$ $\Upsilon(4S)$
<b>0.631<math>\pm</math>0.029 OUR AVERAGE</b> 0.651 $\pm$ 0.025 $\pm$ 0.015 0.60 $\pm$ 0.05 $\pm$ 0.01 0.50 $\pm$ 0.08 $\pm$ 0.01 • • • We do not use the following the followi	<sup>40</sup> GIBBONS <sup>41</sup> BORTOLETTO <sup>42</sup> ALBRECHT wing data for averages,	97B CLE2 92 CLEO 91H ARG fits, limits,	$e^+e^- \rightarrow e^+e^- \rightarrow e^+e^- \rightarrow e^+e^- \rightarrow e^+e^- \rightarrow 0$ , etc. • • •	$\Upsilon(4S)$ $\Upsilon(4S)$ $\Upsilon(4S)$
<b>0.631 <math>\pm</math> 0.029 OUR AVERAGE</b> 0.651 $\pm$ 0.025 $\pm$ 0.015 0.60 $\pm$ 0.05 $\pm$ 0.01 0.50 $\pm$ 0.08 $\pm$ 0.01 • • • We do not use the follo 0.55 $\pm$ 0.07 $\pm$ 0.01 21	<ul> <li><sup>40</sup> GIBBONS</li> <li><sup>41</sup> BORTOLETTO</li> <li><sup>42</sup> ALBRECHT</li> <li>wing data for averages,</li> <li><sup>43</sup> BORTOLETTO</li> </ul>	97B CLE2 92 CLEO 91H ARG fits, limits, 87 CLEO	$e^{+}e^{-} \rightarrow e^{+}e^{-} \rightarrow e^{$	$\Upsilon(4S)$ $\Upsilon(4S)$ $\Upsilon(4S)$ $\Upsilon(4S)$
<b>0.631 <math>\pm</math> 0.029 OUR AVERAGE</b> 0.651 $\pm$ 0.025 $\pm$ 0.015 0.60 $\pm$ 0.05 $\pm$ 0.01 0.50 $\pm$ 0.08 $\pm$ 0.01 • • • We do not use the follo 0.55 $\pm$ 0.07 $\pm$ 0.01 21 0.62 $\pm$ 0.19 $\pm$ 0.01	<ul> <li><sup>40</sup> GIBBONS</li> <li><sup>41</sup> BORTOLETTO</li> <li><sup>42</sup> ALBRECHT</li> <li>wing data for averages,</li> <li><sup>43</sup> BORTOLETTO</li> <li><sup>44</sup> GREEN</li> </ul>	978 CLE2 92 CLEO 91H ARG fits, limits 87 CLEO 83 CLEO	$e^{+}e^{-} \rightarrow e^{+}e^{-} \rightarrow e^{+}e^{-} \rightarrow$ $e^{+}e^{-} \rightarrow e^{+}e^{-} \rightarrow e^{+}e^{-} \rightarrow e^{+}e^{-} \rightarrow e^{-}$ Repl. by B	$\Upsilon(4S)$ $\Upsilon(4S)$ $\Upsilon(4S)$ $\Upsilon(4S)$ ORTO- 87

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

- <sup>41</sup> BORTOLETTO 92 reports  $[B(B \rightarrow D^0 / \overline{D}^0 \text{ anything}) \times B(D^0 \rightarrow K^- \pi^+)] = 0.0233 \pm 0.0012 \pm 0.0014$ . We divide by our best value  $B(D^0 \rightarrow K^- \pi^+) = (3.85 \pm 0.09) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.
- <sup>42</sup> ALBRECHT 91H reports  $[B(B \rightarrow D^0/\overline{D}^0 \text{ anything}) \times B(D^0 \rightarrow K^-\pi^+)] = 0.0194 \pm 0.0015 \pm 0.0025$ . We divide by our best value  $B(D^0 \rightarrow K^-\pi^+) = (3.85 \pm 0.09) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>43</sup> BORTOLETTO 87 reports  $[B(B \rightarrow D^0 / \overline{D}^0 \text{ anything}) \times B(D^0 \rightarrow K^- \pi^+)] = 0.0210 \pm 0.0015 \pm 0.0021$ . We divide by our best value  $B(D^0 \rightarrow K^- \pi^+) = (3.85 \pm 0.09) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>44</sup> GREEN 83 reports  $[B(B \rightarrow D^0/\overline{D}^0 \text{ anything}) \times B(D^0 \rightarrow K^- \pi^+)] = 0.024 \pm 0.006 \pm 0.004$ . We divide by our best value  $B(D^0 \rightarrow K^- \pi^+) = (3.85 \pm 0.09) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

### $\Gamma(D^*(2010)^{\pm} \text{ anything}) / \Gamma_{\text{total}}$

 $\Gamma_{23}/\Gamma$ 

VALUE	EVIS	DOCUMENT ID <u>TECN</u> COMMENT
0.227±0.016 OUR AVE	RAGE	
$0.247\!\pm\!0.019\!\pm\!0.01$		<sup>45</sup> GIBBONS 97B CLE2 $e^+e^- \rightarrow \Upsilon(4S)$
$0.205\!\pm\!0.019\!\pm\!0.007$		<sup>46</sup> ALBRECHT 96D ARG $e^+e^- \rightarrow \Upsilon(4S)$
$0.230\!\pm\!0.028\!\pm\!0.009$		<sup>47</sup> BORTOLETTO92 CLEO $e^+e^- \rightarrow \Upsilon(4S)$
$\bullet \bullet \bullet$ We do not use the	e followin	g data for averages, fits, limits, etc. 🔹 🔹
$0.28\ \pm 0.05\ \pm 0.01$		<sup>48</sup> ALBRECHT 91H ARG Sup. by AL- BRECHT 96D
$0.22\ \pm 0.04\ +0.07\\-0.04$	5200	<sup>49</sup> BORTOLETTO87 CLEO $e^+e^- \rightarrow \Upsilon(4S)$
$\begin{array}{ccc} 0.27 & \pm 0.06 & +0.08 \\ & -0.06 \end{array}$	510	<sup>50</sup> CSORNA 85 CLEO Repl. by BORTO-
15	_ / _	

<sup>45</sup> GIBBONS 97B reports  $B(B \rightarrow D^*(2010)^+$  anything) =  $0.239 \pm 0.015 \pm 0.014 \pm 0.009$ using CLEO measured *D* and *D*<sup>\*</sup> branching fractions. We rescale to our PDG 96 values of *D* and *D*<sup>\*</sup> branching ratios. Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>46</sup> ALBRECHT 96D reports  $B(B \rightarrow D^*(2010)^+ \text{ anything}) 0.196 \pm 0.019$  using CLEO measured  $B(D^*(2010)^+ \rightarrow D^0 \pi^+) = 0.681 \pm 0.01 \pm 0.013$ ,  $B(D^0 \rightarrow K^- \pi^+) = 0.0401 \pm 0.0014$ ,  $B(D^0 \rightarrow K^- \pi^+ \pi^+ \pi^-) = 0.081 \pm 0.005$ ., We rescale to our PDG 96 values of D and  $D^*$  branching ratios. Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>47</sup> BORTOLETTO 92 reports  $B(B \rightarrow D^*(2010)^+ \text{ anything}) = 0.25 \pm 0.03 \pm 0.04$  using MARK II  $B(D^*(2010)^+ \rightarrow D^0 \pi^+) = 0.57 \pm 0.06$  and  $B(D^0 \rightarrow K^- \pi^+) = 0.042 \pm 0.008$ . We rescale to our PDG 96 values of *D* and *D*\* branching ratios. Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>48</sup> ALBRECHT 91H reports  $0.348 \pm 0.060 \pm 0.035$  for  $B(D^*(2010)^+ \rightarrow D^0 \pi^+) = 0.55 \pm 0.04$ . We rescale to our best value  $B(D^*(2010)^+ \rightarrow D^0 \pi^+) = (68.3 \pm 1.4) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value. Uses the PDG 90  $B(D^0 \rightarrow K^- \pi^+) = 0.0371 \pm 0.0025$ .

<sup>49</sup> BORTOLETTO 87 uses old MARK III (BALTRUSAITIS 86E) branching ratios  $B(D^0 \rightarrow K^- \pi^+) = 0.056 \pm 0.004 \pm 0.003$  and also assumes  $B(D^*(2010)^+ \rightarrow D^0 \pi^+) = 0.056 \pm 0.004 \pm 0.003$ 

 $0.60^{+0.08}_{-0.15}$ . The product branching ratio for B( $B \rightarrow D^*(2010)^+$ ) B( $D^*(2010)^+ \rightarrow D^0\pi^+$ ) is  $0.13 \pm 0.02 \pm 0.012$ . Superseded by BORTOLETTO 92.

<sup>50</sup> V-A momentum spectrum used to extrapolate below p = 1 GeV. We correct the value assuming  $B(D^0 \rightarrow K^- \pi^+) = 0.042 \pm 0.006$  and  $B(D^{*+} \rightarrow D^0 \pi^+) = 0.6^{+0.08}_{-0.15}$ . The product branching fraction is  $B(B \rightarrow D^{*+}X) \cdot B(D^{*+} \rightarrow \pi^+ D^0) \cdot B(D^0 \rightarrow K^- \pi^+) = (68 \pm 15 \pm 9) \times 10^{-4}$ .

## $\Gamma(D^*(2007)^0 \text{ anything})/\Gamma_{\text{total}}$

× .--

/ \_ \_

Г<sub>24</sub>/Г

**0.260±0.023±0.015** <sup>51</sup> GIBBONS 97B CLE2  $e^+e^- \rightarrow \Upsilon(4S)$ <sup>51</sup> GIBBONS 97B reports B( $B \rightarrow D^*(2007)^0$  anything) 0.247 ± 0.012 ± 0.018 ± 0.018 using CLEO measured D and D\* branching fractions. We rescale to our PDG 96 values of D and D\* branching ratios. Our first error is their experiment's error and our second error is the systematic error from using our best value.

DOCUMENT ID

TECN COMMENT

$\Gamma(D_s^{\pm} \text{ anything}) / \Gamma_{to}$	tal					Г <sub>25</sub> /Г
VALUE	<u>EVTS</u>	DOCUMENT ID		TECN	COMMENT	
$0.100\pm0.025$ OUR AVE	RAGE					
$0.117 {\pm} 0.009 {+} {0.028 \atop -} 0.029$		<sup>52</sup> GIBAUT	96	CLE2	$e^+e^-  ightarrow$	$\Upsilon(4S)$
$0.081 \!\pm\! 0.014 \! \substack{+0.019 \\ -0.020}$		<sup>53</sup> ALBRECHT	<b>9</b> 2G	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$0.085 \!\pm\! 0.013 \!+\! 0.020 \\ -\! 0.021$	257	54 BORTOLETT	<b>09</b> 0	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$0.105 \pm 0.028 {+0.025 \atop -0.026}$		<sup>55</sup> HAAS	86	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$

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

 $0.116 \pm 0.030 \pm 0.028$  56 ALBRECHT 87H ARG  $e^+e^- \rightarrow \Upsilon(4S)$ 

<sup>52</sup> GIBAUT 96 reports  $0.1211 \pm 0.0039 \pm 0.0088$  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. <sup>53</sup> ALBRECHT 92G reports  $[B(B \to D_s^{\pm} \text{ anything}) \times B(D_s^+ \to \phi \pi^+)] = 0.00292 \pm 0.00039 \pm 0.00031$ . We divide by 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.

<sup>54</sup> BORTOLETTO 90 reports  $[B(B \rightarrow D_s^{\pm} \text{ anything}) \times B(D_s^{+} \rightarrow \phi \pi^{+})] = 0.00306 \pm 0.00047$ . 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.

<sup>55</sup> HAAS 86 reports  $[B(B \rightarrow D_s^{\pm} \text{ anything}) \times B(D_s^{+} \rightarrow \phi \pi^{+})] = 0.0038 \pm 0.0010$ . 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. 64  $\pm$  22% decays are 2-body.

<sup>56</sup> ALBRECHT 87H reports  $[B(B \rightarrow D_s^{\pm} \text{ anything}) \times B(D_s^{+} \rightarrow \phi \pi^{+})] = 0.0042 \pm 0.0009 \pm 0.0006$ . 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. 46 ± 16% of  $B \rightarrow D_s X$  decays are 2-body. Superseded by ALBRECHT 92G.

Γ( <i>c</i> <del>c</del> <i>s</i> )/Γ <sub>total</sub>						Г <sub>26</sub> /Г
VALUE		<u>DOCUMENT ID</u>		TECN	COMMENT	
0.219±0.037		J' COAN	98	CLE2	$e^+e^- \rightarrow$	T(4S)
<sup>57</sup> COAN 98 uses $D-\ell$	correlati	ion.				
$\Gamma(D_s D, D_s^* D, D_s L)$	)* , or <i>L</i>	$D^*_s D^*) / \Gamma(D^\pm_s)$ an	ythin	g)		$\Gamma_{27}/\Gamma_{25}$
Sum over modes				TECN	COMMENT	-
0.48 ±0.04 OUR AVI	ERAGE	DOCOMENTID		TECN		
$0.457 \pm 0.019 \pm 0.037$		GIBAUT	96	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$0.58\ \pm 0.07\ \pm 0.09$		ALBRECHT	920	G ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$0.56 \ \pm 0.10$		BORTOLET	ГО90	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
Γ( <i>D</i> *(2010) <sub>α</sub> )/Γ.						
		DOCUMENT ID		TECN	COMMENT	1 28/1
<1.1 × 10 <sup>-3</sup>	90	<sup>58</sup> I ESIAK	92	CBAL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
58   FSIAK 02 set a li	mit on t	he inclusive process	B(h	(CD//E	$< 2.8 \times 10^{\circ}$	-3 at 00% CI
for the range of ma	asses of	892–2045 MeV, ind	depend	$\rightarrow$ $s_{\gamma}$	assumptions	about <i>s</i> -quark
hadronization.			•		•	·
$\Gamma(D_{-1}(2536)^+ \text{ anyth})$	ning)/F	total				Γ20/Γ
$D_{-1}(2536)^{+}$ is t	he narrov	V	n wit	ь <i>г</i> Р _	1+	• 30/ •
$V_{S1}(2000)$ is t					L .	
	00	<u>восомент по</u> 59 рісці і	00		<u>comment</u>	$\Upsilon(\Lambda S)$
50	90	DISHAI	90	CLE2	$e \cdot e \rightarrow$	7 (43)
S Assuming factorizat	ion, the	decay constant ${}^{r}D_{2}$	⊢ is a ∙1	t least a	factor of 2.	b times smaller
than $f_{D_s^+}$ .						
$\Gamma(D_{s}^{+}\pi^{-}, D_{s}^{*+}\pi^{-})$	$D_{\epsilon}^{+}\rho^{-}$	, $D_s^{*+}\rho^-$ , $D_s^+\eta$	r <sup>0</sup> , D	$*^{+}\pi^{0}$	$D_s^+\eta, D_s^*$	$+\eta$ , $D_{s}^{+}\rho^{0}$ ,
$D_{e}^{*+}\rho^{0}, D_{e}^{+}\omega, D_{e}^{*-}$	<sup>+</sup> ω)̃/Γ <sub>t</sub>	otal		5	5 5	Г <sub>29</sub> /Г
Sum over modes						,
VALUE <0 000E	<u> </u>	60 ALEXANDER	0.025	$\frac{1ECN}{CLEQ}$	<u>COMMENT</u>	22(4.5)
<b>&lt;0.0005</b>	90	** ALEXANDER	( 93E	3 CLE2	$e \cdot e \rightarrow$	1 (45)
<sup>00</sup> ALEXANDER 93B	reports	$< 4.8 \times 10^{-4}$ for	$B(D_s^+)$	$\rightarrow \phi$	$\pi^+) = 0.03$	7. We rescale
to our best value	$B(D^+_s$ -	$\rightarrow \phi \pi^+) = 0.036$	. Th	is branc	hing ratio li	mit provides a
model-dependent u	pper limi	$ V_{ub} / V_{cb}  < 0$	).16 a	t CL=90	0%.	
$\Gamma(J/\psi(1S))$ anything	)/ <b>Γ</b> tata					Г <u>а</u> 1 /Г
$VALUE (units 10^{-2})$	FVTS			TECN	COMMENT	- 51/ -
1.13±0.06 OUR AVER	AGE	DOCOMENT ID		TLEN	COMMENT	
$1.11\!\pm\!0.05\!\pm\!0.04$	1489	<sup>61</sup> BALEST	<b>95</b> B	CLE2	$e^+ e^- \rightarrow$	$\Upsilon(4S)$
$1.28\!\pm\!0.44\!\pm\!0.04$	27	<sup>62</sup> MASCHMANI	V 90	CBAL	$e^+ e^- \rightarrow$	$\Upsilon(4S)$
$1.23\!\pm\!0.27\!\pm\!0.04$	120	<sup>63</sup> ALBRECHT	<b>87</b> D	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$1.34\!\pm\!0.24\!\pm\!0.04$	52	<sup>64</sup> ALAM	86	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\bullet \bullet \bullet$ We do not use the	ne follow	ing data for averag	es, fits	s, limits	, etc. • • •	
1.4 + 0.6	7	<sup>65</sup> ALBRECHT	85H	ARG	$e^+e^-  ightarrow$	$\Upsilon(4S)$
-0.5 1 1 +0.21+0.22	16	ббиллс	85		Repl by Al	AM 86
1.1 ±0.21±0.23	40	HAAJ	00	CLEU	пері, бу А	
	cov'			~		/1000 10 00
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- <sup>61</sup> BALEST 95B reports  $1.12 \pm 0.04 \pm 0.06$  for  $B(J/\psi(1S) \rightarrow e^+e^-) = 0.0599 \pm 0.0025$ . We rescale to our best value  $B(J/\psi(1S) \rightarrow e^+e^-) = (6.02 \pm 0.19) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value. They measure  $J/\psi(1S) \rightarrow e^+e^-$  and  $\mu^+\mu^-$  and use PDG 1994 values for the branching fractions. The rescaling is the same for either mode so we use  $e^+e^-$ .
- <sup>62</sup> MASCHMANN 90 reports  $1.12 \pm 0.33 \pm 0.25$  for  $B(J/\psi(1S) \rightarrow e^+e^-) = 0.069 \pm 0.009$ . We rescale to our best value  $B(J/\psi(1S) \rightarrow e^+e^-) = (6.02 \pm 0.19) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

<sup>63</sup> ALBRECHT 87D reports  $1.07 \pm 0.16 \pm 0.22$  for  $B(J/\psi(1S) \rightarrow e^+e^-) = 0.069 \pm 0.009$ . We rescale to our best value  $B(J/\psi(1S) \rightarrow e^+e^-) = (6.02 \pm 0.19) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value. ALBRECHT 87D find the branching ratio for  $J/\psi$  not from  $\psi(2S)$  to be  $0.0081 \pm 0.0023$ .

<sup>64</sup> ALAM 86 reports  $1.09 \pm 0.16 \pm 0.21$  for  $B(J/\psi(1S) \rightarrow \mu^+ \mu^-) = 0.074 \pm 0.012$ . We rescale to our best value  $B(J/\psi(1S) \rightarrow \mu^+ \mu^-) = (6.01 \pm 0.19) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

 $^{65}$  Statistical and systematic errors were added in quadrature. ALBRECHT 85H also report a CL = 90% limit of 0.007 for  $B \rightarrow J/\psi(1S) + X$  where  $m_X < 1$  GeV.

<sup>66</sup> Dimuon and dielectron events used.

### $\Gamma(J/\psi(1S)(\text{direct}) \text{ anything})/\Gamma_{\text{total}}$

	•,,					
VALUE		DOCUMENT ID		TECN	COMMENT	
0.0080±0.0008	67	BALEST	<b>95</b> B	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$	)

<sup>67</sup> BALEST 95B assume PDG 1994 values for sub mode branching ratios.  $J/\psi(1S)$  mesons are reconstructed in  $J/\psi(1S) \rightarrow e^+ e^-$  and  $J/\psi(1S) \rightarrow \mu^+ \mu^-$ . The  $B \rightarrow J/\psi(1S)$ X branching ratio contains  $J/\psi(1S)$  mesons directly from B decays and also from feeddown through  $\psi(2S) \rightarrow J/\psi(1S)$ ,  $\chi_{c1}(1P) \rightarrow J/\psi(1S)$ , or  $\chi_{c2}(1P) \rightarrow J/\psi(1S)$ . Using the measured inclusive rates, BALEST 95B corrects for the feeddown and finds the  $B \rightarrow J/\psi(1S)$  (direct) X branching ratio.

$\Gamma(\psi(2S) \text{ anything}) / \Gamma_{to}$	otal				Г <sub>33</sub> /Г
VALUE	EVTS	DOCUMENT ID	TECN	COMMENT	
$0.0035\pm0.0005$ OUR AVE	RAGE				
$0.0034 \pm 0.0004 \pm 0.0003$	240	<sup>68</sup> BALEST	95B CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$0.0046 \pm 0.0017 \pm 0.0011$	8	ALBRECHT	87d ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$

<sup>68</sup> BALEST 95B assume PDG 1994 values for sub mode branching ratios. They find B( $B \rightarrow \psi(2S)X, \ \psi(2S) \rightarrow \ \ell^+ \ell^-) = 0.30 \pm 0.05 \pm 0.04$  and B( $B \rightarrow \ \psi(2S)X, \ \psi(2S) \rightarrow \ J/\psi(1S)\pi^+\pi^-) = 0.37\pm 0.05\pm 0.05$ . Weighted average is quoted for B( $B \rightarrow \ \psi(2S)X$ ).

$\Gamma(\chi_{c1}(1P) \text{ anything})/\Gamma$	total				Г <sub>34</sub> /Г
VALUE	<u>EVTS</u>	DOCUMENT ID	TECN	<u>COMMENT</u>	
0.0042±0.0007 OUR AVE	RAGE				
$0.0040 \pm 0.0006 \pm 0.0004$	112	<sup>69</sup> BALEST	95B CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$0.0105 \pm 0.0035 \pm 0.0025$		<sup>70</sup> ALBRECHT	92e ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
60				2	

<sup>69</sup> BALEST 95B assume B( $\chi_{c1}(1P) \rightarrow J/\psi(1S)\gamma$ ) = (27.3 ± 1.6)×10<sup>-2</sup>, the PDG 1994 value. Fit to  $\psi$ -photon invariant mass distribution allows for a  $\chi_{c1}(1P)$  and a  $\chi_{c2}(1P)$  component.

 $^{70}\text{ALBRECHT}$  92E assumes no  $\chi_{\textit{C2}}(1P)$  production.

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 $\Gamma_{32}/\Gamma$ 

$\Gamma(\chi_{c1}(1P)(direct) anything)/\Gamma_{total}$					
VALUE	DOCUMENT ID	TECN	<u>COMMENT</u>		
0.0037±0.0007	71 BALEST	95B CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$	

<sup>71</sup> BALEST 95B assume PDG 1994 values.  $J/\psi(1S)$  mesons are reconstructed in the  $e^+e^$ and  $\mu^+\mu^-$  modes. The  $B \to \chi_{c1}(1P)X$  branching ratio contains  $\chi_{c1}(1P)$  mesons directly from B decays and also from feeddown through  $\psi(2S) \to \chi_{c1}(1P)\gamma$ . Using the measured inclusive rates, BALEST 95B corrects for the feeddown and finds the  $B \to \chi_{c1}(1P)$  (direct) X branching ratio.

$\Gamma(\chi_{c2}(1P))$ any	ything)	/Γ <sub>total</sub>				Г <sub>36</sub> /Г			
VALUE	<u>CL%</u>	<u>EVTS</u>	DOCUMENT ID	TECN	COMMENT				
<0.0038	90	35	<sup>72</sup> BALEST	95b CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$			
72 BALEST 95	<sup>72</sup> BALEST 95B assume B( $\chi_{c2}(1P) \rightarrow J/\psi(1S)\gamma$ ) = (13.5 ± 1.1)×10 <sup>-2</sup> , the PDG 1994								
value. $J/\psi(1S)$ mesons are reconstructed in the $e^+e^-$ and $\mu^+\mu^-$ modes, and PDG 1994 branching fractions are used. If interpreted as signal, the $35 \pm 13$ events correspond									
to B( $B \rightarrow 2$	$\chi_{c2}(1P)$	)X) =(0	$0.25 \pm 0.10 \pm 0.03)$	$1 \times 10^{-2}$ .					

$(\eta_c(15))$ anything $/$	l <sub>total</sub>				<sub>37</sub> /
VALUE	<u>CL%</u>	DOCUMENT ID	TECN	COMMENT	
<0.009	90	<sup>73</sup> BALEST	95B CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$

<sup>73</sup> BALEST 95B assume PDG 1994 values for sub mode branching ratios.  $J/\psi(1S)$  mesons are reconstructed in  $J/\psi(1S) \rightarrow e^+e^-$  and  $J/\psi(1S) \rightarrow \mu^+\mu^-$ . Search region 2960  $< m_{\eta_c(1S)} < 3010 \text{ MeV}/c^2$ .

$\Gamma(K^{\pm}$ anything)/ $\Gamma_{total}$					Г <sub>38</sub> /Г
VALUE	DOCUMENT ID		TECN	<u>COMMENT</u>	
$0.789 \pm 0.025$ OUR AVERAGE					
$0.82\ \pm 0.01\ \pm 0.05$	ALBRECHT	94C	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$0.775 \!\pm\! 0.015 \!\pm\! 0.025$	<sup>74</sup> ALBRECHT	93I	ARG	$e^+ e^- \rightarrow$	$\Upsilon(4S)$
$0.85\ \pm 0.07\ \pm 0.09$	ALAM	<b>87</b> B	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\bullet \bullet \bullet$ We do not use the follow	ing data for average	s, fits,	, limits,	etc. • • •	
seen	75 BRODY	82	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
seen	<sup>76</sup> GIANNINI	82	CUSB	$e^+e^- \rightarrow$	$\Upsilon(4S)$

<sup>74</sup> ALBRECHT 931 value is not independent of the sum of  $B \rightarrow K^+$  anything and  $B \rightarrow K^-$  anything ALBRECHT 94C values.

<sup>75</sup> Assuming  $\Upsilon(4S) \rightarrow B\overline{B}$ , a total of  $3.38 \pm 0.34 \pm 0.68$  kaons per  $\Upsilon(4S)$  decay is found (the second error is systematic). In the context of the standard *B*-decay model, this leads to a value for  $(b\text{-quark} \rightarrow c\text{-quark})/(b\text{-quark} \rightarrow all)$  of  $1.09 \pm 0.33 \pm 0.13$ .

<sup>76</sup> GIANNINI 82 at CESR-CUSB observed 1.58  $\pm$  0.35  $K^0$  per hadronic event much higher than 0.82  $\pm$  0.10 below threshold. Consistent with predominant  $b \rightarrow cX$  decay.

$\Gamma(K^+ \text{anything}) / \Gamma_{\text{total}}$					Г <sub>39</sub> /Г
VALUE	DOCUMENT ID		TECN	COMMENT	
0.66 ±0.05	<sup>77</sup> ALBRECHT	<b>9</b> 4C	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\bullet$ $\bullet$ $\bullet$ We do not use the follow	ing data for averages	s, fits,	limits,	etc. • • •	
$\begin{array}{r} 0.620 \!\pm\! 0.013 \!\pm\! 0.038 \\ 0.66 \ \pm\! 0.05 \ \pm\! 0.07 \end{array}$	<sup>78</sup> ALBRECHT <sup>78</sup> ALAM	<b>94</b> С 87В	ARG CLEO	$e^+e^- \rightarrow e^+e^- \rightarrow$	$\Upsilon(4S)$ $\Upsilon(4S)$

<sup>77</sup> Measurement relies on lepton-kaon correlations. It is for the weak decay vertex and does not include mixing of the neutral B meson. Mixing effects were corrected for by assuming a mixing parameter r of  $(18.1 \pm 4.3)$ %.

<sup>78</sup> Measurement relies on lepton-kaon correlations. It includes production through mixing of the neutral B meson.

$\Gamma(K^{-}$ anything)/ $\Gamma_{total}$				Г <sub>40</sub> /І
VALUE	DOCUMENT ID	TECN	COMMENT	
0.13 ±0.04	<sup>79</sup> ALBRECHT	94c ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
• • • We do not use the follo	wing data for average	s, fits, limits,	etc. • • •	
$0.165 \!\pm\! 0.011 \!\pm\! 0.036$	<sup>80</sup> ALBRECHT	94c ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$0.19 \pm 0.05 \pm 0.02$	<sup>80</sup> ALAM	87b CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$

<sup>79</sup> Measurement relies on lepton-kaon correlations. It is for the weak decay vertex and does not include mixing of the neutral B meson. Mixing effects were corrected for by assuming a mixing parameter r of  $(18.1 \pm 4.3)$ %.

<sup>80</sup> Measurement relies on lepton-kaon correlations. It includes production through mixing of the neutral B meson.

$\Gamma(K^{0}/K^{0} \text{ anything})/\Gamma_{\text{total}}$				Г	΄ <sub>41</sub> /Γ
VALUE	DOCUMENT ID	TECN	<u>COMMENT</u>		
0.64 $\pm$ 0.04 OUR AVERAGE					
$0.642\!\pm\!0.010\!\pm\!0.042$	<sup>81</sup> ALBRECHT	94c ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$	
$0.63\ \pm 0.06\ \pm 0.06$	ALAM	87b CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$	
<sup>81</sup> ALBRECHT 94C assume a <i>K</i>	$\sqrt{6}/\overline{K}^0$ multiplicity t	twice that of	$K^0_{\mathbf{S}}$ .		

$\Gamma(K^*(892)^{\pm} \text{ anything}) / \Gamma_{\text{total}}$				Г <sub>42</sub> /Г
VALUE	DOCUMENT ID	TECN	<u>COMMENT</u>	
$0.182 \pm 0.054 \pm 0.024$	ALBRECHT	94J ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$

$\Gamma(K^*(892)^0/\overline{K}^*(892)^0 \text{ anything})/\Gamma_{\text{total}}$						
VALUE		DOCUMENT ID		TECN	COMMENT	
$0.146 {\pm} 0.016 {\pm} 0.020$		ALBRECHT	94J	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\Gamma(K^*(892)\gamma)/\Gamma_{total}$						Γ44/Ι
VALUE	<u>CL%</u>	DOCUMENT ID		TECN	COMMENT	
• • • We do not use the	followin	g data for averages	s, fits	, limits,	etc. • • •	

$< 1.5 \times 10^{-3}$	90	<sup>82</sup> LESIAK	92 CBAL	$e^+ e^-  ightarrow ~ \Upsilon(4S)$
$< 2.4 \times 10^{-4}$	90	ALBRECHT	88h ARG	$e^+e^-  ightarrow ~\Upsilon(4S)$

<sup>82</sup>LESIAK 92 set a limit on the inclusive process B( $b \rightarrow s\gamma$ )  $< 2.8 \times 10^{-3}$  at 90% CL for the range of masses of 892-2045 MeV, independent of assumptions about s-quark hadronization.

#### $\Gamma(K_1(1400)\gamma)/\Gamma_{\text{total}}$

<b>(</b> = <b>( ) () ( ) ()(</b>						
VALUE	CL%	DOCUMENT ID		TECN	COMMENT	
<4.1 × 10 <sup>-4</sup>	90	ALBRECHT	88H	ARG	$e^+e^- \rightarrow \Upsilon(4S)$	
• • • We do not use the	following	data for averages	, fits,	limits,	etc. • • •	
$< 1.6 \times 10^{-3}$	90 8	<sup>3</sup> LESIAK	92	CBAL	$e^+e^- \rightarrow \Upsilon(4S)$	

 $^{83}{\sf LESIAK}$  92 set a limit on the inclusive process  ${\sf B}(b \rightarrow ~s\gamma) < 2.8 \times 10^{-3}$  at 90% CL for the range of masses of 892-2045 MeV, independent of assumptions about s-quark hadronization.

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 $\Gamma_{45}/\Gamma$ 

$\Gamma(K_2^*(1430)\gamma)/\Gamma_{\text{total}}$						1 46/1
VALUE	<u>CL%</u>	DOCUMENT ID		TECN	<u>COMMENT</u>	
<8.3 × 10 <sup>-4</sup>	90	ALBRECHT	88H	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\Gamma(K_2(1770)\gamma)/\Gamma_{\text{total}}$						Г <sub>47</sub> /Г
VALUE	<u>CL%</u>	DOCUMENT ID		TECN	COMMENT	
<1.2 × 10 <sup>-3</sup>	90	<sup>84</sup> LESIAK	92	CBAL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
<sup>84</sup> LESIAK 92 set a lim for the range of mass hadronization.	it on the ses of 89	e inclusive process 92–2045 MeV, ind	B(b - epend	$ ightarrow$ $s\gamma)$ ent of a	$< 2.8  imes 10^{\circ}$	<sup>—3</sup> at 90% CL about <i>s</i> -quark
$\Gamma(K_3^*(1780)\gamma)/\Gamma_{total}$						Г <sub>48</sub> /Г
VALUE 2	<u>CL%</u>	DOCUMENT ID		TECN	COMMENT	
$<3.0 \times 10^{-5}$	90	ALBRECHT	88H	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\Gamma(K_4^*(2045)\gamma)/\Gamma_{total}$						Г <sub>49</sub> /Г
VALUE	<u>CL%</u>	DOCUMENT ID		TECN	<u>COMMENT</u>	
<1.0 × 10 <sup>-3</sup>	90	<sup>85</sup> LESIAK	92	CBAL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
for the range of mass hadronization.	it on the ses of 8	92–2045 MeV, ind	B(b - epend	$\rightarrow s\gamma$ ) ent of a	< 2.8 × 10 assumptions	about <i>s</i> -quark
$\Gamma(\overline{b} \to \overline{s}\gamma)/\Gamma_{\text{total}}$						Г <sub>50</sub> /Г
VALUE		DOCUMENT ID		<u>TECN</u>	COMMENT	
$(2.32\pm0.57\pm0.35)\times10^{-1}$		ALAM	95	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\Gamma(\overline{b} \rightarrow \overline{s}$ gluon)/ $\Gamma_{tota}$				TECN	COMMENT	Г <sub>51</sub> /Г
$\frac{\Gamma(\overline{b} \to \overline{s}gluon)}{VALUE} \xrightarrow{CL\%}_{00}$	<b> </b> <u>EVTS</u>	<u>DOCUMENT ID</u>		<u>TECN</u>	<u>COMMENT</u>	۲ <sub>51</sub> /۲
$   \frac{\Gamma(\overline{b} \to \overline{s} \text{gluon}) / \Gamma_{\text{tota}}}{\sqrt{ALUE}} \xrightarrow{CL\%} 90 $ ••• We do not use the	<b>l</b> <u>EVTS</u> followir	<u>DOCUMENT ID</u> <sup>86</sup> COAN ng data for average	98 98. fits	<u>TECN</u> CLE2 . limits.	$\frac{COMMENT}{e^+e^-} \rightarrow$ etc. • • •	<b>Γ<sub>51</sub>/Γ</b> <i>Υ</i> (4 <i>S</i> )
$   \frac{\Gamma(\overline{b} \rightarrow \overline{s} \text{gluon}) / \Gamma_{\text{tota}}}{\langle 0.068 \rangle} $ $   \underbrace{ \begin{array}{c} & \\ & \\ & \\ & \\ & \\ & \\ & \\ & \\ & \\ & $	<b>I</b> <u>EVTS</u> followir 2	DOCUMENT ID 86 COAN ng data for average 87 ALBRECHT	98 s, fits 95D	<u>TECN</u> CLE2 , limits, ARG	$\frac{COMMENT}{e^+e^-} \rightarrow etc. \bullet \bullet \bullet$ $e^+e^- \rightarrow \bullet$	<b>Γ<sub>51</sub>/Γ</b> <i>Υ</i> (4 <i>S</i> ) <i>Υ</i> (4 <i>S</i> )
$\Gamma(\overline{b} \rightarrow \overline{s}gluon)/\Gamma_{tota}$ <u>VALUE</u> <u>CL%</u> <b>&lt;0.068</b> 90 ••• We do not use the <b>&lt;0.08</b> <sup>86</sup> COAN 98 uses <i>D-l</i> cc <sup>87</sup> ALBRECHT 95D use for charmless <i>B</i> deca If interpreted as $b \rightarrow$ quoted above. Result	l EVTS followin 2 orrelatio full rec y can be s gluor : is highl	<u>DOCUMENT ID</u> 86 COAN ng data for average 87 ALBRECHT n. onstruction of one e interpreted as eit n they find a branc y model dependen	98 95D <i>B</i> de Cher <i>b</i> hing r t.	$\frac{TECN}{CLE2}$ , limits, ARG cay as t $\rightarrow sg$ ratio of	$\frac{COMMENT}{e^+e^-} \rightarrow etc. \bullet \bullet \bullet \\ e^+e^- \rightarrow etc.$ rag. Two calluon or $b^-$ $\sim 0.026$ or $t^-$	$\Gamma_{51}/\Gamma$ $\Upsilon(4S)$ $\Upsilon(4S)$ and transition the upper limit
$\Gamma(\overline{b} \rightarrow \overline{s}gluon)/\Gamma_{tota}$ <u>VALUE</u> <u>CL%</u> <b>&lt;0.068</b> 90 ••• We do not use the <b>&lt;0.08</b> <sup>86</sup> COAN 98 uses <i>D-l</i> cc <sup>87</sup> ALBRECHT 95D use for charmless <i>B</i> deca If interpreted as $b \rightarrow$ quoted above. Result $\Gamma(\pi^{\pm} anything)/\Gamma_{tota}$	I EVTS followin 2 orrelatio full rec y can be s gluor : is highl	DOCUMENT ID 86 COAN ng data for average 87 ALBRECHT n. onstruction of one e interpreted as eit n they find a branc y model dependen	98 95D <i>B</i> de cher <i>b</i> hing r t.	$\frac{TECN}{CLE2}$ , limits, ARG cay as t $\rightarrow sg$ ratio of	$\frac{COMMENT}{e^+e^-} \rightarrow etc. \bullet \bullet \bullet \\ e^+e^- \rightarrow etc.$ rag. Two calluon or $b^-$ $\sim 0.026$ or $t^-$	$\Gamma_{51}/\Gamma$ $\Upsilon(4S)$ $\Upsilon(4S)$ and transition the upper limit $\Gamma_{52}/\Gamma$
$\Gamma(\overline{b} \rightarrow \overline{sgluon})/\Gamma_{tota}$ $\xrightarrow{VALUE} CL\%$ $<0.068 90$ $\bullet \bullet We do not use the$ $<0.08$ $\overset{86}{} COAN 98 uses D-\ell cc$ $\overset{87}{} ALBRECHT 95D use$ for charmless <i>B</i> deca If interpreted as <i>b</i> $\rightarrow$ quoted above. Result $\Gamma(\pi^{\pm} anything)/\Gamma_{tota}$ $\xrightarrow{VALUE}$	I EVTS followir 2 orrelatio full rec y can be s gluor : is highl	<u>DOCUMENT ID</u> 86 COAN ng data for average 87 ALBRECHT n. onstruction of one e interpreted as eit n they find a branc y model dependen	98 95D <i>B</i> de ther <i>b</i> hing r t.	$\frac{TECN}{CLE2}$ , limits, ARG cay as t $\rightarrow sg$ atio of <u>TECN</u>	$\frac{COMMENT}{e^+e^-} \rightarrow etc. \bullet \bullet \bullet \\ e^+e^- \rightarrow etc.$ ag. Two caluon or $b^- \sim 0.026$ or $t^- \sim 0.026$ or $t^- \sim 0.026$	$\Gamma_{51}/\Gamma$ $\Upsilon(4S)$ $\Upsilon(4S)$ and idate events $\rightarrow u$ transition the upper limit $\Gamma_{52}/\Gamma$
$\Gamma(\overline{b} \rightarrow \overline{s}gluon)/\Gamma_{tota}$ <u>VALUE</u> <u>CL%</u> <0.068 90 ••• We do not use the <0.08 <sup>86</sup> COAN 98 uses <i>D</i> -ℓ cc <sup>87</sup> ALBRECHT 95D use for charmless <i>B</i> deca If interpreted as $b \rightarrow$ quoted above. Result $\Gamma(\pi^{\pm} anything)/\Gamma_{tota}$ <u>VALUE</u> 3.585±0.025±0.070	followir 2 orrelatio full rec y can be s gluor is highl	DOCUMENT ID 86 COAN ng data for average 87 ALBRECHT n. onstruction of one interpreted as eit n they find a branc y model dependent <u>DOCUMENT ID</u> 88 ALBRECHT	98 95D <i>B</i> de cher <i>b</i> hing r t. 93I	$\frac{TECN}{CLE2}$ , limits, ARG cay as t $\rightarrow sg$ ratio of $\frac{TECN}{ARG}$	$\frac{COMMENT}{e^+e^-} \rightarrow etc. \bullet \bullet \bullet \\ e^+e^- \rightarrow etc.$ $e^+e^- \rightarrow etc.$ $e^+e^- \rightarrow etc.$ $e^+e^- \rightarrow etc.$ $\frac{COMMENT}{e^+e^-} \rightarrow etc.$	$\Gamma_{51}/\Gamma$ $\Upsilon(4S)$ $\Upsilon(4S)$ and idate events u transition the upper limit $\Gamma_{52}/\Gamma$ $\Upsilon(4S)$
$\Gamma(\overline{b} \rightarrow \overline{s}gluon)/\Gamma_{tota}$ $\xrightarrow{VALUE} CL\%$ <0.068 90 •••We do not use the <0.08 <sup>86</sup> COAN 98 uses <i>D</i> -ℓ cc <sup>87</sup> ALBRECHT 95D use for charmless <i>B</i> deca If interpreted as <i>b</i> → quoted above. Result $\Gamma(\pi^{\pm} anything)/\Gamma_{tota}$ <sup>88</sup> ALBRECHT 93 exclution $0.025 \pm 0.080$ .	$\frac{ }{EVTS}$ followin 2 orrelatio full rec y can be s gluor is highl al udes $\pi^{\pm}$	$\frac{DOCUMENT \ ID}{86} COAN$ ng data for average 87 ALBRECHT n. onstruction of one interpreted as eit in they find a branc y model dependent $\frac{DOCUMENT \ ID}{88}$ ALBRECHT from $K_S^0$ and $\Lambda$	98 95D <i>B</i> de cher <i>b</i> hing r t. 931 decay	$\frac{TECN}{CLE2}$ , limits, ARG cay as t $\rightarrow sg$ ratio of $\frac{TECN}{ARG}$ s. If in	$\frac{COMMENT}{e^+e^-} \rightarrow etc. \bullet \bullet \bullet \\ e^+e^- \rightarrow etc.$ $e^+e^- \rightarrow etc.$ $e^+e^- \rightarrow etc.$ $\frac{COMMENT}{e^+e^-} \rightarrow etc.$ $e^+e^- \rightarrow etc.$ $e^+e^- \rightarrow etc.$ $e^+e^- \rightarrow etc.$ $e^+e^- \rightarrow etc.$	$\Gamma_{51}/\Gamma$ $\Upsilon(4S)$ $\Upsilon(4S)$ and idate events u transition the upper limit $\Gamma_{52}/\Gamma$ $\Upsilon(4S)$ $\chi$ find 4.105 ±
$\Gamma(\overline{b} \rightarrow \overline{s}gluon)/\Gamma_{tota}$ $\xrightarrow{VALUE} CL\%$ <0.068 90 ••• We do not use the <0.08 <sup>86</sup> COAN 98 uses <i>D</i> -ℓ cc <sup>87</sup> ALBRECHT 95D use for charmless <i>B</i> deca If interpreted as <i>b</i> → quoted above. Result $\Gamma(\pi^{\pm} anything)/\Gamma_{tota}$ <i>VALUE</i> <b>3.585±0.025±0.070</b> <sup>88</sup> ALBRECHT 93 exclution 0.025 ± 0.080. $\Gamma(\eta anything)/\Gamma_{total}$ <i>VALUE</i>	$\frac{ }{EVTS}$ followin 2 orrelatio full rec y can be s gluor is highl al	$\frac{DOCUMENT \ ID}{86} COAN$ ag data for average 87 ALBRECHT a. onstruction of one interpreted as eit a they find a branc by model dependen $\frac{DOCUMENT \ ID}{5}$ 88 ALBRECHT from $K_{S}^{0}$ and $\Lambda$ $\frac{DOCUMENT \ ID}{5}$	98 95D <i>B</i> de cher <i>b</i> hing r t. 931 decay	$\frac{TECN}{CLE2}$ , limits, ARG cay as t $\rightarrow sg$ ratio of $\frac{TECN}{ARG}$ rs. If in $\frac{TECN}{TECN}$	$\frac{COMMENT}{e^+e^-} \rightarrow etc. \bullet \bullet \bullet \\ e^+e^- \rightarrow etc. \bullet \bullet \bullet \\ e^+e^- \rightarrow etc.$ Tag. Two calluon or $b^- \rightarrow condent - conden$	$\Gamma_{51}/\Gamma$ $\Upsilon(4S)$ $\Upsilon(4S)$ andidate events $\downarrow u$ transition the upper limit $\Gamma_{52}/\Gamma$ $\Upsilon(4S)$ $\chi$ find 4.105 $\pm$ $\Gamma_{53}/\Gamma$
$\Gamma(\overline{b} \rightarrow \overline{sgluon})/\Gamma_{total}$ $\xrightarrow{VALUE} CL\%$ <0.068 90 ••• We do not use the <0.08 <sup>86</sup> COAN 98 uses <i>D</i> - <i>l</i> cc <sup>87</sup> ALBRECHT 95D use for charmless <i>B</i> deca If interpreted as <i>b</i> → quoted above. Result $\Gamma(\pi^{\pm} \text{ anything})/\Gamma_{total}$ <i>VALUE</i> <b>3.585±0.025±0.070</b> <sup>88</sup> ALBRECHT 93 exclution $0.025 \pm 0.080$ . $\Gamma(\eta \text{ anything})/\Gamma_{total}$ <i>VALUE</i> <b>0.176±0.011±0.012</b>	$\frac{ }{EVTS}$ followir 2 orrelatio full rec y can be s gluor is highl udes $\pi^{\pm}$	$\frac{DOCUMENT \ ID}{86}$ 86 COAN ag data for average 87 ALBRECHT a. onstruction of one e interpreted as eit a they find a brance y model dependent $\frac{DOCUMENT \ ID}{88}$ ALBRECHT from $K_S^0$ and $\Lambda$ $\frac{DOCUMENT \ ID}{KUBOTA}$	98 95D <i>B</i> de ther <i>b</i> hing r t. 931 decay 96	$\frac{TECN}{CLE2}$ , limits, ARG cay as t $\rightarrow sg$ atio of $\frac{TECN}{ARG}$ rs. If in $\frac{TECN}{CLE2}$	$\frac{COMMENT}{e^+e^-} \rightarrow etc. \bullet \bullet$	$\Gamma_{51}/\Gamma$ $\Upsilon(4S)$ $\Upsilon(4S)$ and idate events $\rightarrow u$ transition the upper limit $\Gamma_{52}/\Gamma$ $\Upsilon(4S)$ $\Upsilon(4S)$ $\Upsilon(4S)$
$\Gamma(\overline{b} \rightarrow \overline{s}gluon)/\Gamma_{total}$ $\xrightarrow{VALUE} CL\%$ <0.068 90 ••• We do not use the <0.08 <sup>86</sup> COAN 98 uses <i>D</i> -ℓ cc <sup>87</sup> ALBRECHT 95D use for charmless <i>B</i> deca If interpreted as <i>b</i> → quoted above. Result $\Gamma(\pi^{\pm} anything)/\Gamma_{total}$ <i>VALUE</i> <b>3.585±0.025±0.070</b> <sup>88</sup> ALBRECHT 93 exclution $0.025 \pm 0.080$ . $\Gamma(\eta anything)/\Gamma_{total}$ <i>VALUE</i> <b>0.176±0.011±0.012</b> $\Gamma(\rho^0 anything)/\Gamma_{total}$	$\frac{ }{EVTS}$ followin 2 orrelatio full rec y can be s gluor is highl al udes $\pi^{\pm}$	$\frac{DOCUMENT \ ID}{86}$ 86 COAN ag data for average 87 ALBRECHT a. onstruction of one interpreted as eit to they find a brance y model dependent $\frac{DOCUMENT \ ID}{88}$ 88 ALBRECHT from $K_S^0$ and $\Lambda$ $\frac{DOCUMENT \ ID}{KUBOTA}$	98 95D <i>B</i> de cher <i>b</i> hing r t. 931 decay 96	$\frac{TECN}{CLE2}$ , limits, ARG cay as t $\rightarrow sg$ ratio of $\frac{TECN}{ARG}$ rs. If in $\frac{TECN}{CLE2}$	$\frac{COMMENT}{e^+e^-} \rightarrow etc. \bullet \bullet \bullet \\ e^+e^- \rightarrow etc. \bullet \bullet \bullet \\ e^+e^- \rightarrow etc.$ Two calluon or $b^- \rightarrow condent - c$	$\Gamma_{51}/\Gamma$ $\tau(4S)$ $\tau(4S)$ indidate events $u \text{ transition}$ $r_{52}/\Gamma$ $\tau(4S)$ $\tau(4S)$ $r_{53}/\Gamma$ $\tau(4S)$ $\tau(4S)$ $\Gamma_{54}/\Gamma$
$\Gamma(\overline{b} \rightarrow \overline{s}gluon)/\Gamma_{total}$ $\xrightarrow{VALUE} CL\%$ <0.068 90 ••• We do not use the <0.08 <sup>86</sup> COAN 98 uses <i>D</i> -ℓ cc <sup>87</sup> ALBRECHT 95D use for charmless <i>B</i> deca If interpreted as <i>b</i> → quoted above. Result $\Gamma(\pi^{\pm} \text{ anything})/\Gamma_{total}$ <i>VALUE</i> <b>3.585±0.025±0.070</b> <sup>88</sup> ALBRECHT 93 exclution $0.025 \pm 0.080$ . $\Gamma(\eta \text{ anything})/\Gamma_{total}$ <i>VALUE</i> <b>0.176±0.011±0.012</b> $\Gamma(\rho^0 \text{ anything})/\Gamma_{total}$ <i>VALUE</i>	$\frac{1}{EVTS}$ followir 2 orrelatio full rec y can be s gluor i is highl al udes $\pi^{\pm}$	$\frac{DOCUMENT \ ID}{86}$ 86 COAN ag data for average 87 ALBRECHT a. onstruction of one interpreted as eit to they find a brance by model dependent $\frac{DOCUMENT \ ID}{88}$ ALBRECHT from $K_{S}^{0}$ and $\Lambda$ $\frac{DOCUMENT \ ID}{KUBOTA}$	98 95D B de cher b hing r t. 931 decay 96	$\frac{TECN}{CLE2}$ , limits, ARG cay as t $\rightarrow sg$ atio of $\frac{TECN}{ARG}$ s. If in $\frac{TECN}{CLE2}$	$\frac{COMMENT}{e^+e^- \rightarrow}$ etc. • • • $e^+e^- \rightarrow$ tag. Two calluon or $b^- \rightarrow$ $\sim 0.026$ or $t^- \rightarrow$ $\frac{COMMENT}{e^+e^- \rightarrow}$ cluded, they $\frac{COMMENT}{e^+e^- \rightarrow}$	$\Gamma_{51}/\Gamma$ $\tau(4S)$ $\tau(4S)$ $r(4S)$ $r(4S)$ $r_{52}/\Gamma$ $\tau(4S)$ $r_{53}/\Gamma$ $\tau(4S)$ $r_{54}/\Gamma$

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$\Gamma(\omega  ext{ anything})/\Gamma_{ ext{to}}$	tal					Г <sub>55</sub> /Г
VALUE	<u>CL%</u>	DOCUMENT ID		TECN	COMMENT	
<0.81	90	ALBRECHT	94J	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\Gamma(\phi \text{ anything})/\Gamma_{ ext{to}}$	tal					Г <sub>56</sub> /Г
VALUE		DOCUMENT ID		TECN	COMMENT	
$0.035 \pm 0.007$ OUR	AVERAGE	Error includes so	ale fa	ctor of 1	L.8.	
$0.0390 \pm 0.0030 \pm 0.000$	)35	ALBRECHT	94J	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$0.023 \pm 0.006 \pm 0.000$	)5	BORTOLETT	086	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\Gamma(\Lambda_c^{\pm} \text{ anything}) / \Gamma_t$	total					Г <sub>57</sub> /Г
VALUE	CL%	DOCUMENT ID		TECN	<u>COMMENT</u>	
0.064±0.008±0.00	)8	<sup>89</sup> CRAWFORD	92	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
• • We do not use	the followir	ng data for average	es, fits	, limits,	etc. • • •	(())
0.14 + 0.00		90 AL RRECHT	885	ARC ,	a+ a- ,	$\Upsilon(\Lambda S)$
$0.14 \pm 0.09$	00	91 AL ANA	001		$e^+e^-$	$\Upsilon(45)$
89 CRAWFORD 92	result derive	ed from lepton ba	ryon o	correlatio	ons. Assum	es all charmed
baryons in B <sup>0</sup> and	+ R⊥ deca∖	/ are /i				
baryons in $B^0$ and 90 AL PRECUT Sec.	d $B^{\perp}$ decay	$(P \rightarrow A^{+} \mathbf{V}) P(A^{+})$		- K+	-) _ (0 20 +	$0.12 \pm 0.06)0/$
<sup>90</sup> ALBRECHT 88E r	d <i>B</i> ∸ decay neasured B(	$(B \rightarrow \Lambda_c^+ X) \cdot B(\Lambda_c^+ X)$	$\rightarrow$	${}_{o}K^{-}\pi^{+}$	$(0.30 \pm$	$0.12 \pm 0.06)\%$
baryons in $B^0$ and 90 ALBRECHT 88E m and used $B(\Lambda_c^+ \rightarrow$	$B^{\pm}$ decay measured B( $M p K^{-} \pi^{+})$	$(B \rightarrow \Lambda_c^+ X) \cdot B(\Lambda_c^+ X)$ $(B = (2.2 \pm 1.0)\%$ from	$\frac{1}{2} \rightarrow h$ om AE	$bK^{-}\pi^{+}$	$^{-})=(0.30\pm 30$ to obtain	$0.12\pm0.06)\%$ above number
baryons in $B^0$ and <sup>90</sup> ALBRECHT 88E m and used B( $\Lambda_c^+ \rightarrow$ <sup>91</sup> Assuming all bary	d $B^+$ decay measured B( $p K^- \pi^+$ ) yons result	$(B \rightarrow \Lambda_c^+ X) \cdot B(\Lambda_c^+ X) = (2.2 \pm 1.0)\%$ from charmed bar	$\frac{1}{2} \rightarrow p$ om AE yons,	ο <i>Κ<sup>—</sup> π<sup>+</sup></i> RAMS 8 ALAM 8	$(-) = (0.30 \pm 30$ to obtain 36 conclude	$0.12\pm0.06)\%$ above number the branching
baryons in $B^0$ and 90 ALBRECHT 88E m and used B( $\Lambda_c^+ \rightarrow$ 91 Assuming all bary fraction is 7.4 $\pm$ 2	d $B^{\perp}$ decay measured B( $P P K^{-} \pi^{+})$ yons result 2.9%. The l	$(B \rightarrow \Lambda_c^+ X) \cdot B(\Lambda_c^+ X)$ $(B \rightarrow \Lambda_c^+ X) \cdot B(\Lambda_c^+ X) \cdot B(\Lambda_c^+ X)$ $(A = (2.2 \pm 1.0)\%$ from the charmed bary from the charmed bary	$\frac{1}{2} \rightarrow p$ om AE yons, s mod	ο K <sup></sup> π <sup>+</sup> RAMS & ALAM & el indep	$(-) = (0.30 \pm 30 \text{ to obtain})$ 30 to conclude endent.	$0.12\pm0.06)\%$ above number the branching
baryons in $B^0$ and <sup>90</sup> ALBRECHT 88E m and used $B(\Lambda_c^+ \rightarrow$ <sup>91</sup> Assuming all bary fraction is 7.4 ± 2 $\Gamma(\Lambda^+ \text{ anything})/\Gamma(1)$	d $B^{\perp}$ decay measured B( $p \ p \ K^{-} \ \pi^{+}$ ) yons result 2.9%. The l	$(B \rightarrow \Lambda_c^+ X) \cdot B(\Lambda_c^+ X)$ $(B \rightarrow \Lambda_c^+ X) \cdot B(\Lambda_c^+ X) \cdot B(\Lambda_c^+ X)$ $(A = (2.2 \pm 1.0)\%$ from the second	$\frac{1}{2} \rightarrow f$ om AE yons, s mod	$pK^{-}\pi^{+}$ RAMS ALAM el indep	$(0.30 \pm 100) = (0.30 \pm 100)$ $(0.30 \pm 100) = (0.30 \pm 100)$	0.12±0.06)% above number the branching Γεε/Γεο
baryons in $B^0$ and $9^0$ ALBRECHT 88E m and used $B(\Lambda_c^+ \rightarrow 9^1$ Assuming all bary fraction is 7.4 ± 2 $T(\Lambda_c^+$ anything)/ $\Gamma(M_c^+)$	$d B^{\perp} decay \\ measured B( \\ p K^{-} \pi^{+}) \\ rons result \\ 2.9\%. The l \\ (\Lambda^{-}_{c} anyth)$	$(B \rightarrow \Lambda_c^+ X) \cdot B(\Lambda_c^+ X)$ $(B \rightarrow \Lambda_c^+ X) \cdot B(\Lambda_c^+ X) \cdot B(\Lambda_c^+ X)$ $(A \rightarrow A + X) \cdot B(\Lambda_c^+ X)$ $(A \rightarrow A + X) \cdot B(\Lambda_c^+ X)$ $(A \rightarrow A + X) \cdot B(\Lambda_c^+ X) \cdot B(\Lambda_c^+ X)$ from charmed bary from charmed bary $(A \rightarrow A + X) \cdot B(\Lambda_c^+ X) \cdot B(\Lambda_c^+ X)$ $(A \rightarrow A + X) \cdot B(\Lambda_c^+ X) \cdot B(\Lambda_c^+ X) \cdot B(\Lambda_c^+ X) \cdot B(\Lambda_c^+ X)$ from charmed bary from charmed bary $(A \rightarrow A + X) \cdot B(\Lambda_c^+ X) \cdot$	$\frac{1}{2} \rightarrow f$ pm AE yons, s mod	$pK^{-}\pi^{+}$ RAMS & ALAM & el indep <i>TECN</i>	$(0.30 \pm 100) = (0.30 \pm 100)$ 30 to obtain 36 conclude endent. <i>COMMENT</i>	0.12±0.06)% above number the branching <b>Г58/Г59</b>
baryons in $B^0$ and $9^0$ ALBRECHT 88E m and used B( $\Lambda_c^+ \rightarrow$ $9^1$ Assuming all bary fraction is 7.4 $\pm$ 2 $\Gamma(\Lambda_c^+$ anything)/ $\Gamma(\Lambda_c^+$ ALUE ).19 $\pm$ 0.13 $\pm$ 0.04	$\begin{array}{c} B^{\perp} & \text{decay} \\ \text{measured B} \\ p & p & \pi^+ \\ \text{vons result} \\ 2.9\%. & \text{The I} \\ \textbf{(} & \textbf{\Lambda_c^- anyth} \\ \end{array}$	$(B \rightarrow \Lambda_c^+ X) \cdot B(\Lambda_c^+ X) = (2.2 \pm 1.0)\%$ from charmed bar limit given above is <b>ing)</b> $\frac{DOCUMENT ID}{92}$ AMMAR	$\frac{1}{2} \rightarrow f$ yom AE yons, s mod 97	$pK^{-}\pi^{+}$ RAMS & ALAM & el indep <u>TECN</u> CLE2	$(0.30 \pm 0.30 \pm 0.30)$ $(0.30 \pm 0.30)$	$0.12 \pm 0.06)\%$ above number the branching $\Gamma_{58}/\Gamma_{59}$ $\Upsilon(4S)$
baryons in $B^0$ and $9^0$ ALBRECHT 88E m and used B( $\Lambda_c^+ \rightarrow$ $9^1$ Assuming all bary fraction is 7.4 ± 2 $\Gamma(\Lambda_c^+$ anything)/ $\Gamma(V_{ALUE})$ $V_{ALUE}$ $9^2$ AMMAR 97 uses	d $B^{\perp}$ decay neasured B( $\sim pK^{-}\pi^{+})$ yons result $\sim$ 2.9%. The l ( $\Lambda_{c}^{-}$ anyth	( $B \rightarrow \Lambda_c^+ X$ )·B( $\Lambda_c^+$ ( $B \rightarrow \Lambda_c^+ X$ )·B( $\Lambda_c^+$ ( $a = (2.2 \pm 1.0)\%$ from charmed bary from charmed bary limit given above is <b>ing)</b> $\frac{DOCUMENT \ ID}{92}$ AMMAR	$r \rightarrow r$ pom AE yons, s mod 97	$pK^{-}\pi^{+}$ RAMS { ALAM { el indep $\frac{TECN}{CLE2}$	$(0.30 \pm 0.30) = (0.30 \pm 0.30) \pm 0.000$ $(0.30 \pm 0.000) = (0.30 \pm 0.000) \pm 0.000$ $(0.30 \pm 0.000) = (0.30 \pm 0.000) \pm 0.000$ $(0.30 \pm 0.000) \pm 0.0$	$0.12 \pm 0.06)\%$ above number the branching $\Gamma_{58}/\Gamma_{59}$ $\Upsilon(4S)$
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baryons in $B^0$ and $9^0$ ALBRECHT 88E m and used B( $\Lambda_c^+ \rightarrow$ $9^1$ Assuming all bary fraction is 7.4 ± 2 $\Gamma(\Lambda_c^+ \text{ anything})/\Gamma(M_{ALUE})$ $0.19\pm0.13\pm0.04$ $9^2$ AMMAR 97 uses $\Gamma(\Lambda_c^- e^+ \text{ anything})$	$d B^{\perp} decay$ neasured B( $p K^{-} \pi^{+}$ ) yons result $\dot{\gamma}$ 2.9%. The f ( $\Lambda_{c}^{-}$ anyth a high-mon $p / \Gamma (\Lambda_{c}^{\pm}$ an	( $B \rightarrow \Lambda_c^+ X$ )·B( $\Lambda_c^+$ ( $B \rightarrow \Lambda_c^+ X$ )·B( $\Lambda_c^+$ (from charmed bar limit given above is <b>ing)</b> 92 <u>DOCUMENT ID</u> 92 <u>AMMAR</u> mentum lepton tag <b>ything)</b>	$rac{1}{2} \rightarrow r$ pom AE yons, s mod 97 $(P_{\ell} > rac{1}{2})$	$pK^{-}\pi^{+}$ RAMS { ALAM { el indep $\frac{TECN}{CLE2}$ > 1.4 Ge	$(0.30 \pm 0.30)$ = $(0.30 \pm 0.$	$0.12 \pm 0.06)\%$ above number the branching $\Gamma_{58}/\Gamma_{59}$ $\Upsilon(4S)$ $\Gamma_{60}/\Gamma_{57}$
baryons in $B^0$ and $9^0$ ALBRECHT 88E m and used $B(\Lambda_c^+ \rightarrow 9^1$ Assuming all bary fraction is 7.4 ± 2 $\Gamma(\Lambda_c^+ \text{ anything})/\Gamma(M_{ALUE})$ $9^2$ AMMAR 97 uses $\Gamma(\Lambda_c^- e^+ \text{ anything})$ VALUE	d $B^{\perp}$ decay neasured B( $p K^{-} \pi^{+})$ rons result $2$ 2.9%. The l ( $\Lambda_{c}^{-}$ anyth a high-mon a high-mon $(\Gamma(\Lambda_{c}^{\pm}$ an CL%	( $B \rightarrow \Lambda_c^+ X$ )·B( $\Lambda_c^+ X$ ) ( $B \rightarrow \Lambda_c^+ X$ )·B( $\Lambda_c^+ X$ ) ( $D = (2.2 \pm 1.0)\%$ from charmed barged from charmed barged from charmed barged imit given above is <b>ing</b> ) <u>DOCUMENT ID</u> <u>DOCUMENT ID</u>	$rac{1}{2} \rightarrow r$ pom AE yons, s mod 97 $(P_{\ell} > rac{1}{2})$	$pK^{-}\pi^{+}$ RAMS & ALAM & el indep $\frac{TECN}{CLE2}$ > 1.4 Ge TECN	$(0.30 \pm 0.30 \pm 0.00 \pm 0.000)$ $(0.30 \pm 0.000 \pm 0.000)$ $(0.30 \pm 0.000)$ (0.30	$0.12 \pm 0.06)\%$ above number the branching $\Gamma_{58}/\Gamma_{59}$ $\Upsilon(4S)$ $\Gamma_{60}/\Gamma_{57}$
baryons in $B^0$ and $9^0$ ALBRECHT 88E m and used B( $\Lambda_c^+ \rightarrow$ $9^1$ Assuming all bary fraction is 7.4 ± 2 <b>T</b> ( $\Lambda_c^+$ anything)/ <b>T</b> ( <u>ALUE</u> $9^2$ AMMAR 97 uses <b>T</b> ( $\Lambda_c^- e^+$ anything) <u>ALUE</u> <b>C</b> ( $\Lambda_c^- e^+$ anything) <b>C</b> ( $\Lambda_c^- e^-$ anything) <b>C</b> (	$d B^{\perp} decay$ $measured B($ $p K^{-} \pi^{+})$ $rons result f 2.9%. The l (\Lambda_{c}^{-} anytha high-monp / \Gamma (\Lambda_{c}^{\pm} an) g = \frac{CL\%}{90}$	( $B \rightarrow \Lambda_c^+ X$ )·B( $\Lambda_c^+ X$ ) ( $B \rightarrow \Lambda_c^+ X$ )·B( $\Lambda_c^+ X$ ) ( $D = (2.2 \pm 1.0)\%$ from charmed bar- from charmed bar- limit given above is <b>ing</b> ) <u>DOCUMENT ID</u> 92 AMMAR mentum lepton tag <b>ything</b> ) <u>DOCUMENT ID</u> 93 BONVICINI	$rac{1}{2} \rightarrow r$ pom AE yons, s mod 97 $(P_{\ell} > 2)$ 98	$pK^{-}\pi^{+}$ RAMS ALAM el indep $\frac{TECN}{CLE2}$ > 1.4 Ge $\frac{TECN}{CLE2}$	$      \frac{(0.30 \pm 0.30)}{(0.30 \pm 0.30)} = (0.30 \pm 0.30) $ $      \frac{(0.30 \pm 0.30)}{(0.30 \pm 0.30)} = (0.30 \pm 0.30) $ $      \frac{(0.30 \pm 0.30)}{(0.30 \pm 0.30)} = (0.30 \pm 0.30) $ $      \frac{(0.30 \pm 0.30)}{(0.30 \pm 0.30)} = (0.30 \pm 0.30) $ $      \frac{(0.30 \pm 0.30)}{(0.30 \pm 0.30)} = (0.30 \pm 0.30) $	$0.12 \pm 0.06)\%$ above number the branching $\Gamma_{58}/\Gamma_{59}$ $\Upsilon(4S)$ $\Gamma_{60}/\Gamma_{57}$ $\Upsilon(4S)$
baryons in $B^0$ and <sup>90</sup> ALBRECHT 88E m and used $B(\Lambda_c^+ \rightarrow$ <sup>91</sup> Assuming all bary fraction is 7.4 ± 2 $\Gamma(\Lambda_c^+ \text{ anything})/\Gamma(M_{ALUE})$ <sup>92</sup> AMMAR 97 uses $\Gamma(\Lambda_c^- e^+ \text{ anything})$ <u>ALUE</u> <sup>93</sup> BONVICINI 98 us	a high-mon $P \left( \Lambda_{c}^{-} \text{ anyth} \right)$ $P \left( \Lambda_{c}^{-} \text{ anyth} \right)$ $P \left( \Lambda_{c}^{-} \text{ anyth} \right)$ $P \left( \Lambda_{c}^{+} \text$	( $B \rightarrow \Lambda_c^+ X$ )·B( $\Lambda_c^+ X$ ) ( $A \rightarrow X$ ) ( $A \rightarrow X$ ) ( $A \rightarrow X$ ) ( $A \rightarrow X$ ) ( $B \rightarrow X^+ X$ )·B( $\Lambda_c^+ X$ ) ( $A \rightarrow X$ )·B( $\Lambda_c^+ X$ )·B( $\Lambda_c^+ X$ ) ( $A \rightarrow X$ )·B( $\Lambda_c^+ X$ )·B( $\Lambda_c^- X$ )	$rac{1}{2} \rightarrow r$ yom AE yons, s mod 97 $(P_{\ell} > 2)$ 98 um ab	$pK^{-}\pi^{+}$ RAMS 8 ALAM 8 el indep $\frac{TECN}{CLE2}$ > 1.4 Ge $\frac{TECN}{CLE2}$ ove 0.6		$0.12 \pm 0.06)\%$ above number the branching $\Gamma_{58}/\Gamma_{59}$ $\Upsilon(4S)$ $\Gamma_{60}/\Gamma_{57}$ $\Upsilon(4S)$
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baryons in $B^0$ and <sup>90</sup> ALBRECHT 88E m and used B( $\Lambda_c^+ \rightarrow$ <sup>91</sup> Assuming all bary fraction is 7.4 ± 2 $\Gamma(\Lambda_c^+ \text{ anything})/\Gamma(N_c^-)$ <sup>92</sup> AMMAR 97 uses $\Gamma(\Lambda_c^- e^+ \text{ anything})$ <sup>93</sup> BONVICINI 98 us $\Gamma(\Lambda_c^- p \text{ anything})/N$	$d B^{\perp} decay$ $measured B( p K^{-} \pi^{+}) rons result + 2.9\%. The formula the formu$	( $B \rightarrow \Lambda_c^+ X$ )·B( $\Lambda_c^+$ ( $B \rightarrow \Lambda_c^+ X$ )·B( $\Lambda_c^+$ ) = (2.2±1.0)% from charmed bary limit given above is ing) <u>DOCUMENT ID</u> 92 AMMAR mentum lepton tag ything) <u>DOCUMENT ID</u> 93 BONVICINI tron with momentu thing)	$rac{1}{2} \rightarrow r$ pom AE yons, s mod 97 $(P_{\ell} > 2)$ 98 um ab	$pK^{-}\pi^{+}$ RAMS and a set of the set of	$(0.30 \pm 0.30) \pm (0.30) \pm (0.$	$0.12 \pm 0.06)\%$ above number the branching $\Gamma_{58}/\Gamma_{59}$ $\Upsilon(4S)$ $\Gamma_{60}/\Gamma_{57}$ $\Upsilon(4S)$ $\Gamma_{61}/\Gamma_{57}$
baryons in $B^0$ and $9^0$ ALBRECHT 88E m and used B( $\Lambda_c^+ \rightarrow$ $9^1$ Assuming all bary fraction is 7.4 ± 2 $\Gamma(\Lambda_c^+ \text{ anything})/\Gamma(V_{ALUE})$ 0.19±0.13±0.04 $9^2$ AMMAR 97 uses $\Gamma(\Lambda_c^- e^+ \text{ anything})$ VALUE $9^3$ BONVICINI 98 us $\Gamma(\Lambda_c^- p \text{ anything})/V_{ALUE}$	$d B^{\perp} decay$ neasured B( $p K^{-} \pi^{+})$ rons result 2.9%. The l ( $\Lambda_{c}^{-}$ anyth a high-mon $/\Gamma(\Lambda_{c}^{\pm} an)$ rons go ses the elect $\Gamma(\Lambda_{c}^{\pm} an)$	( $B \rightarrow \Lambda_c^+ X$ )·B( $\Lambda_c^+ X$ ) ( $A \rightarrow A_c^+ X$ )·B( $\Lambda_c^+ X$ )·B( $\Lambda_c^+ X$ ) ( $A \rightarrow A_c^+ X$ )·B( $\Lambda_c^+ X$ )·B( $\Lambda_c^- X$ )·B( $\Lambda_c^-$	$rac{P}{2} \rightarrow r$ pom AE yons, s mod 97 $(P_{\ell} > $ 98 um ab	$pK^{-}\pi^{+}$ RAMS and a set of the set of	$(0.30 \pm 0.30) \pm (0.30 \pm 0.30) \pm (0.30) \pm (0.30$	$0.12 \pm 0.06)\%$ above number the branching $\Gamma_{58}/\Gamma_{59}$ $\Upsilon(4S)$ $\Gamma_{60}/\Gamma_{57}$ $\Upsilon(4S)$ $\Gamma_{61}/\Gamma_{57}$
baryons in $B^0$ and <sup>90</sup> ALBRECHT 88E m and used $B(\Lambda_c^+ \rightarrow 9^{11} Assuming all bary fraction is 7.4 ± 2 \Gamma(\Lambda_c^+ anything)/\Gamma(M_c^-)92 AMMAR 97 uses\Gamma(\Lambda_c^- e^+ anything)93 BONVICINI 98 use\Gamma(\Lambda_c^- panything)/\Gamma(M_c^-)93 BONVICINI 98 use\Gamma(\Lambda_c^- panything)/\Gamma(M_c^-)93 BONVICINI 98 use\Gamma(\Lambda_c^- panything)/\Gamma(M_c^-)93 BONVICINI 98 use\Gamma(\Lambda_c^- panything)/\Gamma(M_c^-)$	$d B^{\perp} decay$ $measured B( p K^{-} \pi^{+}) fons result for family the point of the point o$	( $B \rightarrow \Lambda_c^+ X$ )·B( $\Lambda_c^+$ ( $B \rightarrow \Lambda_c^+ X$ )·B( $\Lambda_c^+$ ) = (2.2±1.0)% from charmed bar- limit given above is ing) <u>DOCUMENT ID</u> 92 AMMAR mentum lepton tag <b>ything)</b> <u>DOCUMENT ID</u> 93 BONVICINI tron with momentu thing) <u>DOCUMENT ID</u> BONVICINI	$rac{1}{2} \rightarrow r$ pom AE yons, s mod 97 $(P_{\ell} > 2)$ 98 um ab 98	$pK = \pi^+$ RAMS and a set of the set of th		0.12 $\pm$ 0.06)% above number the branching $\Gamma_{58}/\Gamma_{59}$ $\Upsilon(4S)$ $\Gamma_{60}/\Gamma_{57}$ $\Upsilon(4S)$ $\Gamma_{61}/\Gamma_{57}$ $\Upsilon(4S)$
baryons in $B^0$ and $9^0$ ALBRECHT 88E m and used B( $\Lambda_c^+ \rightarrow$ $9^1$ Assuming all bary fraction is 7.4 ± 2 $\Gamma(\Lambda_c^+ \text{ anything})/\Gamma(\frac{VALUE}{2})$ 0.19±0.13±0.04 $9^2$ AMMAR 97 uses $\Gamma(\Lambda_c^- e^+ \text{ anything})/\frac{VALUE}{2}$ $\sqrt{2}$ BONVICINI 98 us $\Gamma(\Lambda_c^- p \text{ anything})/\frac{VALUE}{2}$ $\sqrt{2}$ D.57±0.05±0.05 $\Gamma(\Lambda_c^- p \text{ anything})/\frac{VALUE}{2}$	$d B^{\perp} decay$ neasured B( $p K^{-} \pi^{+}$ ) yons result = 2.9%. The l ( $\Lambda_{c}^{-}$ anyth a high-mon $p / \Gamma (\Lambda_{c}^{\pm} an)$ go set the elect $\Gamma (\Lambda_{c}^{\pm} anyth)$ = anyth $\Gamma (\Lambda_{c}^{\pm} an)$	( $B \rightarrow \Lambda_c^+ X$ )·B( $\Lambda_c^+$ ( $B \rightarrow \Lambda_c^+ X$ )·B( $\Lambda_c^+$ ) = (2.2±1.0)% from charmed bary limit given above is ing) 92 <u>DOCUMENT ID</u> 92 <u>AMMAR</u> mentum lepton tag 93 <u>BONVICINI</u> tron with momentu thing) <u>DOCUMENT ID</u> BONVICINI	$rac{1}{2} \rightarrow r$ yom AE yons, s mod 97 $(P_{\ell} > 2)$ 98 um ab 98	$pK^{-}\pi^{+}$ RAMS 8 ALAM 8 el indep $\frac{TECN}{CLE2}$ > 1.4 Ge' $\frac{TECN}{CLE2}$ ove 0.6 $\frac{TECN}{CLE2}$		0.12 $\pm$ 0.06)% above number the branching $\Gamma_{58}/\Gamma_{59}$ $\Upsilon(4S)$ $\Gamma_{60}/\Gamma_{57}$ $\Upsilon(4S)$ $\Gamma_{61}/\Gamma_{57}$ $\Upsilon(4S)$
baryons in $B^0$ and $9^0$ ALBRECHT 88E m and used $B(\Lambda_c^+ \rightarrow 9^1$ Assuming all bary fraction is 7.4 ± 2 $\Gamma(\Lambda_c^+ \text{ anything})/\Gamma(V_{ALUE})$ $9^2$ AMMAR 97 uses $\Gamma(\Lambda_c^- e^+ \text{ anything})$ VALUE $9^3$ BONVICINI 98 us $\Gamma(\Lambda_c^- p \text{ anything})/\Gamma(V_{ALUE})$ $0.57 \pm 0.05 \pm 0.05$ $\Gamma(\Lambda_c^- p e^+ \nu_e)/\Gamma(V_{ALUE})$	$d B^{\perp} decay$ $measured B( p K^{-} \pi^{+}) fons result for the point of the p$	( $B \rightarrow \Lambda_c^+ X$ )·B( $\Lambda_c^+$ ( $B \rightarrow \Lambda_c^+ X$ )·B( $\Lambda_c^+ X$ )·B( $\Lambda_c^+$ ( $B \rightarrow \Lambda_c^+ X$ )·B( $\Lambda_c^+ X$ )·B( $\Lambda_c^- X$ )·B	$rac{1}{2} \rightarrow r$ pom AE yons, s mod 97 $(P_{\ell} > 2)$ 98 um ab 98	$BK^{-}\pi^{+}$ RAMS is ALAM is el indep TECN CLE2 > 1.4 Gei TECN CLE2 ove 0.6 TECN CLE2 TECN CLE2	$(0.30 \pm 0.30) \pm (0.30) \pm (0.$	0.12 $\pm$ 0.06)% above number the branching $\Gamma_{58}/\Gamma_{59}$ $\Upsilon(4S)$ $\Gamma_{60}/\Gamma_{57}$ $\Upsilon(4S)$ $\Gamma_{61}/\Gamma_{57}$ $\Upsilon(4S)$ $\Gamma_{62}/\Gamma_{61}$
baryons in $B^0$ and $9^0$ ALBRECHT 88E m and used B( $\Lambda_c^+ \rightarrow$ $9^1$ Assuming all bary fraction is 7.4 ± 2 $\Gamma(\Lambda_c^+ \text{ anything})/\Gamma(V_{ALUE})$ 0.19±0.13±0.04 $9^2$ AMMAR 97 uses $\Gamma(\Lambda_c^- e^+ \text{ anything})/V_{ALUE}$ <0.05 $9^3$ BONVICINI 98 us $\Gamma(\Lambda_c^- p \text{ anything})/V_{ALUE}$ $0.57\pm0.05\pm0.05$ $\Gamma(\Lambda_c^- p e^+ \nu_e)/\Gamma(V_{ALUE})$	$d B^{\perp} decay$ $measured B( p K^{-} \pi^{+}) rons result f 2.9\%. The f (\Lambda_{c}^{-} anythA_{c}^{-} anythA_{c}^{-} anyth\Gamma(\Lambda_{c}^{\pm} anyth\Gamma(\Lambda_{c}^{\pm} anyth\Gamma(\Lambda_{c}^{\pm} anyth\Gamma(\Lambda_{c}^{\pm})$	( $B \rightarrow \Lambda_c^+ X$ )·B( $\Lambda_c^+$ ( $B \rightarrow \Lambda_c^+ X$ )·B( $\Lambda_c^+ X$ )·B( $\Lambda_c^+$ ( $B \rightarrow \Lambda_c^+ X$ )·B( $\Lambda_c^+ X$ )·B( $\Lambda_c^- X$ )·B	$rac{1}{2} \rightarrow r$ pom AE yons, s mod 97 $(P_{\ell} > 2)$ 98 um ab 98 00 98	$pK = \pi^+$ RAMS { RAMS		0.12 $\pm$ 0.06)% above number the branching $\Gamma_{58}/\Gamma_{59}$ $\Upsilon(4S)$ $\Gamma_{60}/\Gamma_{57}$ $\Upsilon(4S)$ $\Gamma_{61}/\Gamma_{57}$ $\Upsilon(4S)$ $\Gamma_{62}/\Gamma_{61}$

$\Gamma(\overline{\Sigma}_{c}^{} \text{ anything})/\Gamma_{\text{total}}$					Г <sub>63</sub> /Г
VALUE EVT	TS <u>DOCUMENT ID</u>		TECN	COMMENT	
$0.0042 \pm 0.0021 \pm 0.0011$ 7	7 <sup>95</sup> PROCARIO	94	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
<sup>95</sup> PROCARIO 94 reports [I	$B(B \rightarrow \overline{\Sigma}^{}_{c})$ anything	g) $\times$ E	$B(\Lambda_{c}^{+} -$	$\rightarrow pK^{-}\pi^{+})$	] = 0.00021 $\pm$
0.00008 $\pm$ 0.00007. We	divide by our best valu	e B(/	$\Lambda_{c}^{+} \rightarrow \mu$	$\sigma K^{-} \pi^{+}) =$	(5.0 $\pm$ 1.3) $ imes$
10 <sup>-2</sup> . Our first error is error from using our best	their experiment's erro : value.	r and	our sec	ond error is	the systematic
$\Gamma(\overline{\Sigma}_{c}^{-} \text{ anything})/\Gamma_{\text{total}}$					Г <sub>64</sub> /Г
VALUE CL	<u>%</u> <u>DOCUMENT ID</u>		TECN	COMMENT	
<b>&lt;0.010</b> 90	<sup>90</sup> PROCARIO	94	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
<sup>96</sup> PROCARIO 94 reports [	$B(B \to \overline{\Sigma}_c^- \text{ anything})$	× B ⊦) _	$(\Lambda_c^+ \rightarrow 0.050)$	pK <sup>-</sup> π <sup>+</sup> )]	= < 0.00048.
we divide by our best va	$C \rightarrow p R R$	) —	0.030.		
$\Gamma(\overline{\Sigma}_{c}^{0} \text{ anything}) / \Gamma_{\text{total}}$					Г <sub>65</sub> /Г
VALUE EV	<u>DOCUMENT ID</u>		TECN	<u>COMMENT</u>	
$0.0046 \pm 0.0021 \pm 0.0012$ 7	<sup>76</sup> <sup>97</sup> PROCARIO	94	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
<sup>97</sup> PROCARIO 94 reports [	$B(B \rightarrow \overline{\Sigma}_{c}^{0} \text{ anything})$	×Β	$(\Lambda_c^+ \rightarrow$	$pK^{-}\pi^{+})]$	$ $ = 0.00023 $\pm$
0.00008 $\pm$ 0.00007. We	divide by our best valu	e B(/	$\Lambda_{C}^{+} \rightarrow \mu$	$\sigma K^- \pi^+) =$	(5.0 $\pm$ 1.3) $ imes$
10 <sup>-2</sup> . Our first error is error from using our best	their experiment's erro : value.	r and	our sec	ond error is	the systematic
$\Gamma(\overline{\Sigma}_{c}^{0}N(N=p \text{ or } n))/\Gamma_{t}$	otal				Г <sub>66</sub> /Г
VALUE CL	<u>%</u> <u>DOCUMENT ID</u>		TECN	<u>COMMENT</u>	
<b>&lt;0.0015</b> 90	<sup>98</sup> PROCARIO	94	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
<sup>98</sup> PROCARIO 94 reports <	< 0.0017 for B( $\Lambda_c^+ \rightarrow$	pK⁻	$(-\pi^{+}) =$	= 0.043. We	rescale to our
best value B( $\Lambda_c^+  o pK$	$(\pi^{+}\pi^{+}) = 0.050.$				
$\Gamma(\Xi_c^0 \text{ anything } \times B(\Xi_c^0))$	$\rightarrow \Xi^{-}\pi^{+}))/\Gamma_{total}$				Г <sub>67</sub> /Г
VALUE (units $10^{-3}$ )	DOCUMENT ID		TECN	COMMENT	
<b>0.144±0.048±0.021</b> 99 BARISH 97 find 79 ± 27	<sup>99</sup> BARISH	97	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
	-c •••••••				
$\Gamma(\Xi_c^+ \text{ anything } \times B(\Xi_c^+))$	$T \rightarrow \Xi^- \pi^+ \pi^+))/\Gamma_0$	total			Г <sub>68</sub> /Г
<u>VALUE (units 10<sup>-3</sup>)</u>	DOCUMENT ID		TECN	COMMENT	
0.453±0.096 <sup>+0.085</sup> -0.065	<sup>100</sup> BARISH	97	CLE2	$e^+e^-  ightarrow$	$\Upsilon(4S)$
$^{100}$ BARISH 97 find 125 $\pm$ 2	$28 = \frac{1}{c}$ events.				

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						Г <sub>69</sub> /Г
NT ID	DOCUMEN	ID	-	TECN	COMMENT	
ΉТ	ALBRECH	- 93	31 <i>i</i>	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
ORD	CRAWFO	D 92	2 (	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
ΉТ	ALBRECH	89	9k A	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
/erages	lata for ave	iges, fi	its,	limits,	etc. • • •	
	<sup>2</sup> ALAM	83	3B (	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
rect pr $6 \pm 0.0$ vields b	and nondire as $> 0.036$ assumed yie	: proto E 0.00 ds belo	ons. )6± ow (	c 0.009 cut, B(	. Data are $B  o p+$	consistent with $X) = 0.03$ no
						[70/[
NT ID	DOCUMEN <sup>-</sup>	ID	-	TECN	COMMENT	- 10/-
ΉТ	ALBRECH	- 93	31 /	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
ORD	CRAWFO	D 92	2 (	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
ΉТ	ALBRECH	89	9k A	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
Λ deca	bution of <i>N</i>	lecay f	from	n the ir	clusive pro	oton yield.
						Г <del>71</del> /Г
ENT ID	DOCUMEN	ID		TECN	COMMEN <sup>®</sup>	т <b></b> ;
ORD	CRAWFO	RD 9	92	CLEO	e <sup>+</sup> e <sup>-</sup> -	$\rightarrow ~ \Upsilon(4S)$
СНТ	ALBREC	Т 8	89K	ARG	e <sup>+</sup> e <sup>-</sup> -	$\rightarrow \Upsilon(4S)$
/erages	lata for ave	nges, fi	its,	limits,	etc. • • •	
STAF	<sup>4</sup> ACKERS	AFF 9	97N	OPAL	e <sup>+</sup> e <sup>-</sup> -	→ Z
	<sup>5</sup> ALAM	8	8 <b>3</b> B	CLEO	e <sup>+</sup> e <sup>-</sup> -	$\rightarrow ~ \Upsilon(4S)$
0.868 :	$\rightarrow B) = 0.$	$68 \pm 0$	0.04	1, <i>i.e.</i> ,	an admixt	ure of $B^0$ , $B^\pm$
0.022 with e	ult as > onsistent w = 0.03.	022 ± h equa	±0. aly	.007 $\pm$ ields of	0.004. p and <del>p</del> .	Values are fo Using assumed
						Г <sub>72</sub> /Г <sub>73</sub>
NT ID	DOCUMEN <sup>®</sup>	ID		TECN	<u>COMMENT</u>	
<u>NT ID</u>	DOCUMEN <sup>®</sup> AMMAR	<u>ID</u> 97	7 (	<u>tecn</u> CLE2	$\frac{COMMENT}{e^+e^-} \rightarrow$	$\Upsilon(4S)$
N <u>T ID</u> R n tag (	<u>DOCUMEN</u> AMMAR tum lepton	<u>ID</u> 97 ag ( <i>P</i> <sub>f</sub>	7 (	<u>TECN</u> CLE2 1.4 Ge <sup>v</sup>	$\frac{COMMENT}{e^+e^-} \rightarrow \frac{1}{c^2}$	$\Upsilon(4S)$
N <u>T ID</u> R n tag (	DOCUMEN <sup>®</sup> AMMAR tum lepton	$\frac{D}{97}$ ag ( $P_\ell$	7 ( 2 >	<u>TECN</u> CLE2 1.4 Ge <sup>V</sup>	$\frac{COMMENT}{e^+e^-} \rightarrow V/c^2).$	Υ(4 <i>S</i> )
<u>NT ID</u> R n tag ( JMENT	DOCUMEN AMMAR tum lepton	$\frac{1D}{97}$ $g (P_{\ell}$ $T T D$	7 ( 2 >	TECN CLE2 1.4 GeV	$\frac{COMMENT}{e^+e^-} \rightarrow 1/c^2$	- Υ(4S) Γ <b>74/Γ</b> <sub>ENT</sub>
<u>NT ID</u> R n tag ( <u>IMENT</u>	DOCUMEN <sup>®</sup> AMMAR tum lepton <u>DOCUN</u>	$\frac{1D}{97}$ ag ( $P_\ell$	<b>7</b> (	<u>TECN</u> CLE2 1.4 GeV	$\frac{COMMENT}{e^+e^-} \rightarrow I/c^2$	τ(4S) Γ <sub>74</sub> /Γ
<u>NT ID</u> n tag ( <u>IMENT</u> WFOR	DOCUMEN AMMAR tum lepton <u>DOCUM</u> CRAW	<u>ID</u> 97 ag ( <i>P<sub>ℓ</sub></i> <u>NT ID</u> ORD	7 ( 2 >	<u>TECN</u> CLE2 1.4 GeV <u>TEC</u> 2 CLE	$\frac{COMMENT}{e^+e^-} \rightarrow I/c^2$	$\Gamma_{74}/\Gamma_{ENT}$

$\Gamma(baryons anything)/\Gamma_{total}$					Г <sub>75,</sub>	/Г
VALUE	DOCUMENT ID		TECN	COMMENT		
$0.068 \pm 0.005 \pm 0.003$	<sup>107</sup> ALBRECHT	920	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$	
• • • We do not use the following	ng data for average	s, fits	, limits,	etc. • • •		
$0.076 \pm 0.014$	<sup>108</sup> ALBRECHT	89k	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$	
<ul> <li><sup>107</sup> ALBRECHT 920 result is fror lations, and various lepton-ba ALBRECHT 89κ.</li> <li><sup>108</sup> ALBRECHT 89κ obtain this</li> </ul>	n simultaneous ana ryon and lepton-bar result by adding the	lysis c yon-a eir the	of <i>p</i> and intibaryo	$\Lambda$ yields, $p \overline{p}$ on correlation	and <i>Ap</i> corns. Supersect	re- Jes for
direct protons and $(4.2 \pm 0.)$ $(5.5 \pm 1.6)\%$ for neutron probaryons, they divide by 2 to $\phi$	$5\pm0.6)\%$ for incl oduction and add i obtain $(7.6\pm1.4)\%$	usive t in a 6.	Λ produ also. Si	uction. The nce each <i>B</i>	y then assu decay has t	me wo
Γ( <i>ρ</i> panything)/Γ <sub>total</sub>					Г <sub>76</sub> ,	/Г
Includes $p$ and $\overline{p}$ from $\Lambda$ as	nd $\overline{\Lambda}$ decay.					
VALUE EVTS	DOCUMENT ID		TECN	COMMENT		
$0.0247 \pm 0.0023$ OUR AVERAGE				+ -	00(4.6)	
$0.024 \pm 0.001 \pm 0.004$	CRAWFORD	92	CLEO	$e e \rightarrow + -$	I(4S)	
$0.025 \pm 0.002 \pm 0.002 918$	ALBRECHT	89K	ARG	$e \cdot e \rightarrow$	7 (45)	
Γ(ppanything)/Γ(p/panyt	hing)				Г <sub>76</sub> /Г	69
Includes $p$ and $\overline{p}$ from $\Lambda$ as	nd A decay.		TECN	COMMENT		
<u>value</u>	<u>DOCUMENTID</u>		<u>TECN</u>			
• • • We do not use the following	100	s, mus	, innits,			
$0.30 \pm 0.02 \pm 0.05$	<sup>109</sup> CRAWFORD	92	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$	
<sup>109</sup> CRAWFORD 92 value is not	independent of the	ir Γ( <i>μ</i>	ppanyth	ing)/ $\Gamma_{ ext{total}}$	value.	
$\Gamma(\Lambda \overline{p}/\overline{\Lambda}p \text{ anything})/\Gamma_{\text{total}}$ Includes $p$ and $\overline{p}$ from $\Lambda$ a	nd $\overline{\Lambda}$ decay.				Г <sub>77</sub> ,	/Г
VALUE EVTS	DOCUMENT ID		TECN	<u>COMMENT</u>		
$0.025 \pm 0.004$ OUR AVERAGE						
$0.029 \pm 0.005 \pm 0.005$	CRAWFORD	92	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$	
$0.023 \pm 0.004 \pm 0.003$ 165	ALBRECHT	89K	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$	
					F /F	,

Includes p and  $\overline{p}$  from  $\Lambda$  and  $\overline{\Lambda}$  decay. DOCUMENT ID TECN COMMENT VALUE  $\bullet$   $\bullet$   $\bullet$  We do not use the following data for averages, fits, limits, etc.  $\bullet$   $\bullet$ <sup>110</sup> CRAWFORD  $0.76\!\pm\!0.11\!\pm\!0.08$ 92 CLEO  $e^+e^- \rightarrow \Upsilon(4S)$ <sup>110</sup>CRAWFORD 92 value is not independent of their  $[\Gamma(\Lambda \overline{p} \text{ anything}) + \Gamma(\overline{\Lambda} p \text{ anything})] / \Gamma_{\text{total}}$  value.

#### $\Gamma(\Lambda \overline{\Lambda} \text{anything})/\Gamma_{\text{total}}$ Γ<sub>78</sub>/Γ VALUE CL% EVTS DOCUMENT ID TECN COMMENT CRAWFORD 92 CLEO $e^+e^- \rightarrow \Upsilon(4S)$ 90 < 0.005 • • • We do not use the following data for averages, fits, limits, etc. • • • < 0.0088 ALBRECHT 89k ARG $e^+e^- \rightarrow \Upsilon(4S)$ 90 12

$\Gamma(\Lambda \overline{\Lambda} \text{anything}) / \Gamma(\Lambda)$	/ <del>/</del> anythin	g)				Г <sub>78</sub> /Г <sub>71</sub>	
VALUE	<u>CL%</u>	DOCUMENT ID		TECN	COMMENT		
$\bullet \bullet \bullet$ We do not use the	following d	ata for averages	, fits	, limits,	etc. • • •		
<0.13	90 111	CRAWFORD	92	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$	
$^{111}$ CRAWFORD 92 valu	e is not inde	ependent of thei	r Г(/	$\sqrt{\Lambda}$ any th	ing)/Γ <sub>total</sub>	value.	
$\Gamma(e^+ e^- s) / \Gamma_{\text{total}}$						Г <sub>79</sub> /Г	
Test for $\Delta B = 1$ w	eak neutral <u>CL%</u>	current. <u>DOCUMENT ID</u>		TECN	<u>COMMENT</u>		
<5.7 × 10 <sup>-5</sup>	90	GLENN	98	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$	
$\bullet$ $\bullet$ $\bullet$ We do not use the	following d	ata for averages	, fits	, limits,	etc. • • •		
<0.05	90	BEBEK	81	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$	
$\Gamma(\mu^+\mu^-s)/\Gamma_{total}$ Test for $\Delta B = 1$ w	eak neutral	current.				Г <sub>80</sub> /Г	
VALUE	<u>CL%</u>	DOCUMENT ID		TECN	COMMENT		
<5.8 × 10 <sup>-5</sup>	90	GLENN	98	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$	
• • • We do not use the	following d	ata for averages	, fits	, limits,	etc. • • •		
<0.017	90	CHADWICK	81	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$	
$\begin{bmatrix} \Gamma(e^+e^-s) + \Gamma(\mu^+\mu) \\ \text{Test for } \Delta B = 1 \text{ w} \end{bmatrix}$	<b>ι<sup>—</sup>s)]/Γ<sub>tc</sub></b> æak neutral	<b>stal</b> current.			(	Г <sub>79</sub> +Г <sub>80</sub> )/Г	
VALUE	<u>CL%</u>	DOCUMENT ID		TECN	COMMENT		
<4.2 × 10 <sup>-5</sup>	90	GLENN	98	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$	
• • We do not use the	following d	ata for averages	, fits	, limits,	etc. • • •		
< 0.0024	90 112 00 113	BEAN	87	CLEO	Repl. by G	LENN 98	
<0.0062	90 110	AVERY	84	CLEO	Repl. by B	EAN 87	
<sup>112</sup> BEAN 87 reports $\lfloor (\mu 113 - \mu 113) \rfloor$	$^{+}\mu^{-})+(e^{-})$	<sup>+</sup> e <sup>−</sup> )]/2 and w	e con	verted i	t.		
<sup>113</sup> Determine ratio of $B$	$+$ to $B^{\circ}$ set	mileptonic decay	's to	be in th	e range 0.25	5–2.9.	
$\Gamma(e^{\pm}\mu^{\mp}s)/\Gamma_{\text{total}}$	ulv number	conservation				Г <sub>81</sub> /Г	
VALUE	CL%	DOCUMENT ID		TECN	COMMENT		
<2.2 × 10 <sup>-5</sup>	90	GLENN	98	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$	

### $B^{\pm}/B^{0}$ ADMIXTURE REFERENCES

	90	PR D57 3847	M. Bishai+	(CLEO Collab.)				
BONVICINI	98	PR D (to be publ.)	G. Bonvicini+	(CLEO Collab.)				
CLNS 97/1519								
COAN	98	PRL 80 1150	T.E. Coan+	(CLEO Collab.)				
GLENN	98	PRL 80 2289	S. Glenn+	(CLEO Collab.)				
ACKERSTAFF	97N	ZPHY C74 423	K. Ackerstaff+	(OPAL Collab.)				
AMMAR	97	PR D55 13	R. Ammar+	(CLEO Collab.)				
BARISH	97	PRI 79 3599	B Barish+	(CLEO Collab.)				
BUSKIIIIC	97R	7PHY C73 601	D Buskulic+	(ALEPH Collab.)				
CIBBONS	07B	PR D56 3783		(CLEO Collab.)				
	06D	PL B374 256	Hamachar Hofmann Kirchhoff	(ARCUS Collab.)				
	90D	DDI 76 1570	+ Chadha Chan Eiren	(CLEO Collab.)				
	900	PRE 70 1370	+Chaulia, Chail, Ligen+					
GIBAUT	90	PR D53 4734	+Kinoshita, Pomianowski, Barish+					
KUBUTA	96	PR D53 6033	+Lattery, Momayezi, Neison+	(CLEO Collab.)				
PDG	90	PR D54 1						
ALAM	95	PRL 74 2885	+Kim, Ling, Mahmood+	(CLEO Collab.)				
ALBRECHT	95D	PL B353 554	+Hamacher, Hotmann, Kirchott+	(ARGUS Collab.)				
BALEST	95B	PR D52 2661	+Cho, Ford, Johnson+	(CLEO Collab.)				
BARISH	95	PR D51 1014	+Chadha, Chan, Cowen+	(CLEO Collab.)				
BUSKULIC	95B	PL B345 103	+ Casper, De Bonis, Decamp $+$	(ALEPH Collab.)				
ALBRECHT	94C	ZPHY C62 371	+Ehrlichmann, Hamacher, Hofmann $+$	(ARGUS Collab.)				
ALBRECHT	94 J	ZPHY C61 1	+Ehrlichmann, Hamacher, Hofmann+	(ARGUS Collab.)				
PROCARIO	94	PRL 73 1306	+Balest, Cho, Daoudi, Ford+	(CLEO Collab.)				
ALBRECHT	93	ZPHY C57 533	+Ehrlichmann, Hamacher, Hofmann $+$	(ARGUS Collab.)				
ALBRECHT	93E	ZPHY C60 11	+Ehrlichmann, Hamacher, Hofmann+	(ARGUS Collab.)				
ALBRECHT	93H	PL B318 397	+Ehrlichmann, Hamacher, Hofmann+	(ARGUS Collab.)				
ALBRECHT	93I	ZPHY C58 191	+Cronstroem, Ehrlichmann, Hamacher+	(ARGUS Collab.)				
ALEXANDER	93B	PL B319 365	+Bebek, Berkelman, Bloom, Browder+	(CLEO Collab.)				
ARTUSO	93	PL B311 307	, , ,	(SYRA)				
BARTELT	93B	PRL 71 4111	+Csorna, Egyed, Jain, Akerib+	(CLEO Collab.)				
ALBRECHT	92F	PL B277 209	+Fhrlichmann Hamacher Krueger Nau+	(ARGUS Collab.)				
ALBRECHT	92G	7PHY C54 1	+Ehrlichmann Hamacher Krueger Nau+	(ARGUS Collab.)				
ALBRECHT	920	ZPHY C56 1	+Cronstroem Ehrlichmann+	(ARGUS Collab.)				
				( /				
BORTOLETTO	92	PR D45 21	+Brown, Dominick, McIlwain+	(CLEO_Collab.)				
BORTOLETTO	92 92	PR D45 21 PR D45 752	+Brown, Dominick, McIlwain+ +Fulton lensen lohnson+	(CLEO Collab.) (CLEO Collab.)				
BORTOLETTO CRAWFORD HENDERSON	92 92 92	PR D45 21 PR D45 752 PR D45 2212	+Brown, Dominick, McIlwain+ +Fulton, Jensen, Johnson+ +Kinoshita, Pinkin, Procario+	(CLEO Collab.) (CLEO Collab.) (CLEO Collab.)				
BORTOLETTO CRAWFORD HENDERSON	92 92 92 92	PR D45 21 PR D45 752 PR D45 2212 7PHY C55 33	+Brown, Dominick, McIlwain+ +Fulton, Jensen, Johnson+ +Kinoshita, Pipkin, Procario+ +Antreasyan Bartels Besset Bieler+ (Cr	(CLEO Collab.) (CLEO Collab.) (CLEO Collab.) vstal Ball Collab.)				
BORTOLETTO CRAWFORD HENDERSON LESIAK ALBRECHT	92 92 92 92 92 91C	PR D45 21 PR D45 752 PR D45 2212 ZPHY C55 33 PL B255 297	+Brown, Dominick, McIlwain+ +Fulton, Jensen, Johnson+ +Kinoshita, Pipkin, Procario+ +Antreasyan, Bartels, Besset, Bieler+ (Cr +Ehrlichmann, Glaeser, Harder, Krueger+	(CLEO Collab.) (CLEO Collab.) (CLEO Collab.) (Stal Ball Collab.) (ARGUS Collab.)				
BORTOLETTO CRAWFORD HENDERSON LESIAK ALBRECHT AI BRECHT	92 92 92 92 91C 91H	PR D45 21 PR D45 752 PR D45 2212 ZPHY C55 33 PL B255 297 ZPHY C52 353	+Brown, Dominick, Mcllwain+ +Fulton, Jensen, Johnson+ +Kinoshita, Pipkin, Procario+ +Antreasyan, Bartels, Besset, Bieler+ (Cr +Ehrlichmann, Glaeser, Harder, Krueger+ +Ehrlichmann Hamacher Harder+	(CLEO Collab.) (CLEO Collab.) (CLEO Collab.) ystal Ball Collab.) (ARGUS Collab.) (ARGUS Collab.)				
BORTOLETTO CRAWFORD HENDERSON LESIAK ALBRECHT ALBRECHT FUI TON	92 92 92 92 91C 91H 91	PR D45 21 PR D45 752 PR D45 2212 ZPHY C55 33 PL B255 297 ZPHY C52 353 PR D43 651	+Brown, Dominick, Mcllwain+ +Fulton, Jensen, Johnson+ +Kinoshita, Pipkin, Procario+ +Antreasyan, Bartels, Besset, Bieler+ (Cr +Ehrlichmann, Glaeser, Harder, Krueger+ +Ehrlichmann, Hamacher, Harder+ + lensen Johnson Kagan Kass+	(CLEO Collab.) (CLEO Collab.) (CLEO Collab.) (Stal Ball Collab.) (ARGUS Collab.) (ARGUS Collab.) (CLEO Collab.)				
BORTOLETTO CRAWFORD HENDERSON LESIAK ALBRECHT ALBRECHT FULTON YANAGISAWA	92 92 92 92 91C 91H 91 91	PR D45 21 PR D45 752 PR D45 2212 ZPHY C55 33 PL B255 297 ZPHY C52 353 PR D43 651 PRL 66 2436	+Brown, Dominick, Mcllwain+ +Fulton, Jensen, Johnson+ +Kinoshita, Pipkin, Procario+ +Antreasyan, Bartels, Besset, Bieler+ (Cr +Ehrlichmann, Glaeser, Harder, Krueger+ +Ehrlichmann, Hamacher, Harder+ +Jensen, Johnson, Kagan, Kass+ +Heintz, Lee-Franzini, Lovelock, Narain+	(CLEO Collab.) (CLEO Collab.) (CLEO Collab.) (Stal Ball Collab.) (ARGUS Collab.) (ARGUS Collab.) (CLEO Collab.) (CUSB II Collab.)				
BORTOLETTO CRAWFORD HENDERSON LESIAK ALBRECHT ALBRECHT FULTON YANAGISAWA ALBRECHT	92 92 92 91C 91H 91 91 91 90	PR D45 21 PR D45 752 PR D45 2212 ZPHY C55 33 PL B255 297 ZPHY C52 353 PR D43 651 PRL 66 2436 PL B234 409	+Brown, Dominick, Mcllwain+ +Fulton, Jensen, Johnson+ +Kinoshita, Pipkin, Procario+ +Antreasyan, Bartels, Besset, Bieler+ (Cr +Ehrlichmann, Glaeser, Harder, Krueger+ +Ehrlichmann, Hamacher, Harder+ +Jensen, Johnson, Kagan, Kass+ +Heintz, Lee-Franzini, Lovelock, Narain+ +Glaeser Harder Krueger+	(CLEO Collab.) (CLEO Collab.) (CLEO Collab.) (Stal Ball Collab.) (ARGUS Collab.) (ARGUS Collab.) (CLEO Collab.) (CUSB II Collab.) (ARGUS Collab.)				
BORTOLETTO CRAWFORD HENDERSON LESIAK ALBRECHT ALBRECHT FULTON YANAGISAWA ALBRECHT AI BRECHT	92 92 92 91C 91H 91 91 90 90H	PR D45 21 PR D45 752 PR D45 2212 ZPHY C55 33 PL B255 297 ZPHY C52 353 PR D43 651 PRL 66 2436 PL B234 409 PL B249 359	+Brown, Dominick, Mcllwain+ +Fulton, Jensen, Johnson+ +Kinoshita, Pipkin, Procario+ +Antreasyan, Bartels, Besset, Bieler+ (Cr +Ehrlichmann, Glaeser, Harder, Krueger+ +Jensen, Johnson, Kagan, Kass+ +Heintz, Lee-Franzini, Lovelock, Narain+ +Glaeser, Harder, Krueger+ +Ehrlichmann, Glaeser, Harder, Krueger+	(CLEO Collab.) (CLEO Collab.) (CLEO Collab.) ystal Ball Collab.) (ARGUS Collab.) (CLEO Collab.) (CLEO Collab.) (CUSB II Collab.) (ARGUS Collab.) (ARGUS Collab.)				
BORTOLETTO CRAWFORD HENDERSON LESIAK ALBRECHT ALBRECHT FULTON YANAGISAWA ALBRECHT BORTOLETTO	92 92 92 91C 91H 91 90 90H 90	PR D45 21 PR D45 752 PR D45 2212 ZPHY C55 33 PL B255 297 ZPHY C52 353 PR D43 651 PRL 66 2436 PL B234 409 PL B234 959 PRI 64 2117	+Brown, Dominick, Mcllwain+ +Fulton, Jensen, Johnson+ +Kinoshita, Pipkin, Procario+ +Antreasyan, Bartels, Besset, Bieler+ (Cr +Ehrlichmann, Glaeser, Harder, Krueger+ +Ehrlichmann, Hamacher, Harder+ +Jensen, Johnson, Kagan, Kass+ +Heintz, Lee-Franzini, Lovelock, Narain+ +Glaeser, Harder, Krueger+ +Ehrlichmann, Glaeser, Harder, Krueger+ +Goldberg Horwitz Jain Mestaver+	(CLEO Collab.) (CLEO Collab.) (CLEO Collab.) ystal Ball Collab.) (ARGUS Collab.) (ARGUS Collab.) (CLEO Collab.) (CUSB II Collab.) (ARGUS Collab.) (Argus Collab.) (CIEO Collab.)				
BORTOLETTO CRAWFORD HENDERSON LESIAK ALBRECHT ALBRECHT FULTON YANAGISAWA ALBRECHT ALBRECHT BORTOLETTO Also	92 92 92 91C 91H 91 90 90H 90 90 90	PR D45 21 PR D45 752 PR D45 2212 ZPHY C55 33 PL B255 297 ZPHY C52 353 PR D43 651 PRL 66 2436 PL B234 409 PL B249 359 PRL 64 2117 PR D45 21	+Brown, Dominick, Mcllwain+ +Fulton, Jensen, Johnson+ +Kinoshita, Pipkin, Procario+ +Antreasyan, Bartels, Besset, Bieler+ (Cr. +Ehrlichmann, Glaeser, Harder, Krueger+ +Ehrlichmann, Hamacher, Harder+ +Jensen, Johnson, Kagan, Kass+ +Heintz, Lee-Franzini, Lovelock, Narain+ +Glaeser, Harder, Krueger+ +Ehrlichmann, Glaeser, Harder, Krueger+ +Goldberg, Horwitz, Jain, Mestayer+ Bortoletto, Brown, Dominick, Mcllwain+	(CLEO Collab.) (CLEO Collab.) (CLEO Collab.) ystal Ball Collab.) (ARGUS Collab.) (ARGUS Collab.) (CLEO Collab.) (CUSB II Collab.) (ARGUS Collab.) (Argus Collab.) (CLEO Collab.) (CLEO Collab.)				
BORTOLETTO CRAWFORD HENDERSON LESIAK ALBRECHT ALBRECHT FULTON YANAGISAWA ALBRECHT ALBRECHT BORTOLETTO Also FULTON	92 92 92 91C 91H 91 90 90H 90 90 90 90 90 90	PR D45 21 PR D45 752 PR D45 2212 ZPHY C55 33 PL B255 297 ZPHY C52 353 PR D43 651 PRL 66 2436 PL B234 409 PL B249 359 PRL 64 2117 PR D45 21 PRL 64 16	+Brown, Dominick, Mcllwain+ +Fulton, Jensen, Johnson+ +Kinoshita, Pipkin, Procario+ +Antreasyan, Bartels, Besset, Bieler+ (Cr +Ehrlichmann, Glaeser, Harder, Krueger+ +Ehrlichmann, Hamacher, Harder+ +Jensen, Johnson, Kagan, Kass+ +Heintz, Lee-Franzini, Lovelock, Narain+ +Glaeser, Harder, Krueger+ +Ehrlichmann, Glaeser, Harder, Krueger+ +Goldberg, Horwitz, Jain, Mestayer+ Bortoletto, Brown, Dominick, Mcllwain+ +Hempstead, Jensen, Johnson+	(CLEO Collab.) (CLEO Collab.) (CLEO Collab.) (Stal Ball Collab.) (ARGUS Collab.) (ARGUS Collab.) (CLEO Collab.) (CUSB II Collab.) (ARGUS Collab.) (Argus Collab.) (CLEO Collab.) (CLEO Collab.)				
BORTOLETTO CRAWFORD HENDERSON LESIAK ALBRECHT ALBRECHT FULTON YANAGISAWA ALBRECHT ALBRECHT BORTOLETTO Also FULTON MASCHMANN	92 92 92 91C 91H 91 90 90H 90 90 90 90 90 90 90	PR D45 21 PR D45 752 PR D45 2212 ZPHY C55 33 PL B255 297 ZPHY C52 353 PR D43 651 PRL 66 2436 PL B234 409 PL B234 409 PL B249 359 PRL 64 2117 PR D45 21 PRL 64 16 ZPHY C46 555	+Brown, Dominick, Mcllwain+ +Fulton, Jensen, Johnson+ +Kinoshita, Pipkin, Procario+ +Antreasyan, Bartels, Besset, Bieler+ (Cr +Ehrlichmann, Glaeser, Harder, Krueger+ +Ehrlichmann, Hamacher, Harder+ +Jensen, Johnson, Kagan, Kass+ +Heintz, Lee-Franzini, Lovelock, Narain+ +Glaeser, Harder, Krueger+ +Ehrlichmann, Glaeser, Harder, Krueger+ +Goldberg, Horwitz, Jain, Mestayer+ Bortoletto, Brown, Dominick, Mcllwain+ +Hempstead, Jensen, Johnson+	(CLEO Collab.) (CLEO Collab.) (CLEO Collab.) (Stal Ball Collab.) (ARGUS Collab.) (ARGUS Collab.) (CLEO Collab.) (CUSB II Collab.) (ARGUS Collab.) (Argus Collab.) (CLEO Collab.) (CLEO Collab.) (CLEO Collab.) (CLEO Collab.)				
BORTOLETTO CRAWFORD HENDERSON LESIAK ALBRECHT ALBRECHT FULTON YANAGISAWA ALBRECHT ALBRECHT BORTOLETTO Also FULTON MASCHMANN PDG	92 92 92 91C 91H 91 90 90H 90 90 90 90 90 90 90	PR D45 21 PR D45 752 PR D45 2212 ZPHY C55 33 PL B255 297 ZPHY C52 353 PR D43 651 PRL 66 2436 PL B234 409 PL B234 409 PL B249 359 PRL 64 2117 PR D45 21 PRL 64 16 ZPHY C46 555 PI B239	+Brown, Dominick, Mcllwain+ +Fulton, Jensen, Johnson+ +Kinoshita, Pipkin, Procario+ +Antreasyan, Bartels, Besset, Bieler+ (Cr, +Ehrlichmann, Glaeser, Harder, Krueger+ +Ehrlichmann, Hamacher, Harder+ +Jensen, Johnson, Kagan, Kass+ +Heintz, Lee-Franzini, Lovelock, Narain+ +Glaeser, Harder, Krueger+ +Ehrlichmann, Glaeser, Harder, Krueger+ +Goldberg, Horwitz, Jain, Mestayer+ Bortoletto, Brown, Dominick, Mcllwain+ +Hempstead, Jensen, Johnson+ +Antreasyan, Bartels, Besset+ (Cr, Hernandez, Stone, Porter+ (IE)	(CLEO Collab.) (CLEO Collab.) (CLEO Collab.) (Stal Ball Collab.) (ARGUS Collab.) (ARGUS Collab.) (CLEO Collab.) (CUSB II Collab.) (ARGUS Collab.) (Argus Collab.) (CLEO Collab.) (CLEO Collab.) (CLEO Collab.) (CLEO Collab.) (STAL Ball Collab.) (CLEO Collab.)				
BORTOLETTO CRAWFORD HENDERSON LESIAK ALBRECHT ALBRECHT FULTON YANAGISAWA ALBRECHT BORTOLETTO Also FULTON MASCHMANN PDG ALBRECHT	92 92 92 91C 91H 91 90 90 90 90 90 90 89K	PR D45 21 PR D45 752 PR D45 2212 ZPHY C55 33 PL B255 297 ZPHY C52 353 PR D43 651 PRL 66 2436 PL B234 409 PL B249 359 PRL 64 2117 PR D45 21 PRL 64 16 ZPHY C46 555 PL B239 ZPHY C42 519	+Brown, Dominick, Mcllwain+ +Fulton, Jensen, Johnson+ +Kinoshita, Pipkin, Procario+ +Antreasyan, Bartels, Besset, Bieler+ (Cr, +Ehrlichmann, Glaeser, Harder, Krueger+ +Jensen, Johnson, Kagan, Kass+ +Heintz, Lee-Franzini, Lovelock, Narain+ +Glaeser, Harder, Krueger+ +Ehrlichmann, Glaeser, Harder, Krueger+ +Goldberg, Horwitz, Jain, Mestayer+ Bortoletto, Brown, Dominick, Mcllwain+ +Hempstead, Jensen, Johnson+ +Antreasyan, Bartels, Besset+ (Cr Hernandez, Stone, Porter+ (IFI	(CLEO Collab.) (CLEO Collab.) (CLEO Collab.) (Stal Ball Collab.) (ARGUS Collab.) (ARGUS Collab.) (CLEO Collab.) (CUSB II Collab.) (Argus Collab.) (CLEO Collab.) (CLEO Collab.) (CLEO Collab.) (CLEO Collab.) (CLEO Collab.) (CLEO Collab.) (Stal Ball Collab.) (CLEO Collab.) (CLEO Collab.) (CLEO Collab.)				
BORTOLETTO CRAWFORD HENDERSON LESIAK ALBRECHT ALBRECHT FULTON YANAGISAWA ALBRECHT BORTOLETTO Also FULTON MASCHMANN PDG ALBRECHT ISGUR	92 92 92 91C 91H 91 90 90 90 90 90 90 90 89K 89B	PR D45 21 PR D45 752 PR D45 752 PR D45 2212 ZPHY C55 33 PL B255 297 ZPHY C52 353 PR D43 651 PRL 66 2436 PL B234 409 PL B234 409 PL B249 359 PRL 64 2117 PR D45 21 PRL 64 16 ZPHY C46 555 PL B239 ZPHY C42 519 PR D30 700	+Brown, Dominick, Mcllwain+ +Fulton, Jensen, Johnson+ +Kinoshita, Pipkin, Procario+ +Antreasyan, Bartels, Besset, Bieler+ (Cr, +Ehrlichmann, Glaeser, Harder, Krueger+ +Ehrlichmann, Hamacher, Harder+ +Jensen, Johnson, Kagan, Kass+ +Heintz, Lee-Franzini, Lovelock, Narain+ +Glaeser, Harder, Krueger+ +Ehrlichmann, Glaeser, Harder, Krueger+ +Goldberg, Horwitz, Jain, Mestayer+ Bortoletto, Brown, Dominick, Mcllwain+ +Hempstead, Jensen, Johnson+ +Antreasyan, Bartels, Besset+ (Cr Hernandez, Stone, Porter+ (IFi +Boeckmann, Glaeser, Harder+ +Scora, Grinstein, Wise	(CLEO Collab.) (CLEO Collab.) (CLEO Collab.) (ARGUS Collab.) (ARGUS Collab.) (CLEO Collab.) (CLEO Collab.) (CUSB II Collab.) (ARGUS Collab.) (CLEO Collab.) (CLEO Collab.) (CLEO Collab.) (CLEO Collab.) (CLEO Collab.) (CLEO Collab.) (Stal Ball Collab.) (ARGUS Collab.) (ARGUS Collab.)				
BORTOLETTO CRAWFORD HENDERSON LESIAK ALBRECHT ALBRECHT FULTON YANAGISAWA ALBRECHT BORTOLETTO Also FULTON MASCHMANN PDG ALBRECHT ISGUR WACHS	92 92 92 91C 91H 91 90 90 90 90 90 90 90 89K 89B 89	PR D45 21 PR D45 752 PR D45 752 PR D45 2212 ZPHY C55 33 PL B255 297 ZPHY C52 353 PR D43 651 PRL 66 2436 PL B234 409 PL B249 359 PRL 64 2117 PR D45 21 PRL 64 16 ZPHY C46 555 PL B239 ZPHY C42 519 PR D39 799 ZPHY C42 33	+Brown, Dominick, Mcllwain+ +Fulton, Jensen, Johnson+ +Kinoshita, Pipkin, Procario+ +Antreasyan, Bartels, Besset, Bieler+ (Cr, +Ehrlichmann, Glaeser, Harder, Krueger+ +Ehrlichmann, Hamacher, Harder+ +Jensen, Johnson, Kagan, Kass+ +Heintz, Lee-Franzini, Lovelock, Narain+ +Glaeser, Harder, Krueger+ +Ehrlichmann, Glaeser, Harder, Krueger+ Bortoletto, Brown, Dominick, Mcllwain+ +Hempstead, Jensen, Johnson+ +Antreasyan, Bartels, Besset+ (Cr, Hernandez, Stone, Porter+ (IFI +Boeckmann, Glaeser, Harder+ +Scora, Grinstein, Wise +Antreasyan Bartels, Bieler+ (Cr,	(CLEO Collab.) (CLEO Collab.) (CLEO Collab.) ystal Ball Collab.) (ARGUS Collab.) (ARGUS Collab.) (CLEO Collab.) (CNTO, CIT)				
BORTOLETTO CRAWFORD HENDERSON LESIAK ALBRECHT ALBRECHT FULTON YANAGISAWA ALBRECHT BORTOLETTO Also FULTON MASCHMANN PDG ALBRECHT ISGUR WACHS AL BRECHT	92 92 92 91C 91H 91 90 90H 90 90 90 90 90 89K 89B 88F	PR D45 21 PR D45 752 PR D45 752 PR D45 2212 ZPHY C55 33 PL B255 297 ZPHY C52 353 PR D43 651 PRL 66 2436 PL B234 409 PL B249 359 PRL 64 2117 PR D45 21 PRL 64 16 ZPHY C46 555 PL B239 ZPHY C42 519 PR D39 799 ZPHY C42 33 PL B210 263	<ul> <li>+Brown, Dominick, Mcllwain+</li> <li>+Fulton, Jensen, Johnson+</li> <li>+Kinoshita, Pipkin, Procario+</li> <li>+Antreasyan, Bartels, Besset, Bieler+ (Cr,</li> <li>+Ehrlichmann, Glaeser, Harder, Krueger+</li> <li>+Jensen, Johnson, Kagan, Kass+</li> <li>+Heintz, Lee-Franzini, Lovelock, Narain+</li> <li>+Glaeser, Harder, Krueger+</li> <li>+Ehrlichmann, Glaeser, Harder, Krueger+</li> <li>+Goldberg, Horwitz, Jain, Mestayer+</li> <li>Bortoletto, Brown, Dominick, Mcllwain+</li> <li>+Hempstead, Jensen, Johnson+</li> <li>+Antreasyan, Bartels, Besset+ (Cr,</li> <li>Hernandez, Stone, Porter+ (IFI)</li> <li>+Boeckmann, Glaeser, Harder+</li> <li>+Scora, Grinstein, Wise</li> <li>+Antreasyan, Bartels, Bieler+ (Cr,</li> <li>+Boeckmann, Glaeser+</li> </ul>	(CLEO Collab.) (CLEO Collab.) (CLEO Collab.) (Stal Ball Collab.) (ARGUS Collab.) (CLEO Collab.) (CLEO Collab.) (CUSB II Collab.) (ARGUS Collab.) (ARGUS Collab.) (CLEO Collab.) (CNTO, CIT+) (ARGUS Collab.) (ARGUS Collab.)				
BORTOLETTO CRAWFORD HENDERSON LESIAK ALBRECHT ALBRECHT FULTON YANAGISAWA ALBRECHT BORTOLETTO Also FULTON MASCHMANN PDG ALBRECHT ISGUR WACHS ALBRECHT ALBRECHT	92 92 92 91 91 91 90 90 90 90 90 90 90 90 89K 89B 89 88E 88E	PR D45 21 PR D45 752 PR D45 752 PR D45 2212 ZPHY C55 33 PL B255 297 ZPHY C52 353 PR D43 651 PRL 66 2436 PL B234 409 PL B249 359 PRL 64 2117 PR D45 21 PRL 64 16 ZPHY C46 555 PL B239 ZPHY C42 519 PR D39 799 ZPHY C42 33 PL B210 263 PL B210 258	<ul> <li>+Brown, Dominick, Mcllwain+</li> <li>+Fulton, Jensen, Johnson+</li> <li>+Kinoshita, Pipkin, Procario+</li> <li>+Antreasyan, Bartels, Besset, Bieler+ (Cr</li> <li>+Ehrlichmann, Glaeser, Harder, Krueger+</li> <li>+Heintz, Lee-Franzini, Lovelock, Narain+</li> <li>+Glaeser, Harder, Krueger+</li> <li>+Ehrlichmann, Glaeser, Harder, Krueger+</li> <li>+Goldberg, Horwitz, Jain, Mestayer+</li> <li>Bortoletto, Brown, Dominick, Mcllwain+</li> <li>+Hempstead, Jensen, Johnson+</li> <li>+Antreasyan, Bartels, Besset+ (Cr</li> <li>Hernandez, Stone, Porter+ (IF</li> <li>+Boeckmann, Glaeser, Harder+</li> <li>+Scora, Grinstein, Wise</li> <li>+Antreasyan, Bartels, Bieler+ (Cr</li> <li>+Boeckmann, Glaeser+</li> </ul>	(CLEO Collab.) (CLEO Collab.) (CLEO Collab.) (ARGUS Collab.) (ARGUS Collab.) (CLEO Collab.) (CLEO Collab.) (CUSB II Collab.) (ARGUS Collab.) (ARGUS Collab.) (CLEO Collab.) (TNTO, CIT+) (ARGUS Collab.) (ARGUS Collab.) (ARGUS Collab.)				
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ALBRECHT       85H       PL 162B 395         CSORNA       85       PRL 54 1894         HAAS       85       PRL 55 1248         AVERY       84       PRL 53 1309         CHEN       84       PRL 52 1084         LEVMAN       84       PL 141B 271         ALAM       83B       PRL 51 1143         GREEN       83       PRL 51 347         KLOPFEN       83B       PL 130B 444         ALTARELLI       82       NP B208 365         BRODY       82       PRL 48 1070         GIANNINI       82       NP B206 1         BEBEK       81       PRL 46 84         CHADWICK       81       PRL 46 88         ABRAMS       80       PRL 44 10	+Binder, Harder+ +Garren, Mestayer, Panvini+ +Hempstead, Jensen, Kagan+ +Bebek, Berkelman, Cassel+ +Goldberg, Horwitz, Jawahery+ +Sreedhar, Han, Imlay+ +Csorna, Garren, Mestayer+ +Hicks, Sannes, Skubic+ Klopfenstein, Horstkotte+ +Cabibbo, Corbo, Maini, Martinelli +Chen, Goldberg, Horwitz+ +Finocchiaro, Franzini+ +Haggerty, izen, Longuemare+ +Ganci, Kagar, Kass+ +Alam, Blocker, Boyarski+	(ARGUS Collab.) (CLEO Collab.) (CLEO Collab.) (CLEO Collab.) (CLEO Collab.) (CUSB Collab.) (CLEO Collab.) (CUSB Collab.) (CUSB Collab.) (ROMA, INFN, FRAS) (CLEO Collab.) (CUSB Collab.) (CLEO Collab.) (CLEO Collab.) (CLEO Collab.) (CLEO Collab.)
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