$$B^{\pm}$$

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

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

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

B^{\pm} MASS

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

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT	
5279.0±0.5 OU	R FIT				
5279.1±0.5 OU	R AVERAGE				
$5279.1 \pm 0.4 \pm 0.4$	4 526	¹ CSORNA	00 CLE2	$e^+e^- ightarrow ~\Upsilon(4S)$	
$5279.1 \pm 1.7 \pm 1.4$	4 147	ABE	96b CDF	<i>р<mark>р</mark> at 1.8 TeV</i>	
\bullet \bullet \bullet We do not	use the followi	ng data for averages	s, fits, limits,	etc. • • •	
$5278.8 \pm 0.54 \pm 2.0$) 362	ALAM	94 CLE2	$e^+e^- \rightarrow \Upsilon(4S)$	
$5278.3 \pm 0.4 \pm 2.0$)	BORTOLETT	O92 CLEO	$e^+e^- ightarrow ~\Upsilon(4S)$	
$5280.5 \pm 1.0 \pm 2.0$)	² ALBRECHT	90J ARG	$e^+e^- \rightarrow \Upsilon(4S)$	
5275.8±1.3 ±3.0) 32	ALBRECHT	87c ARG	$e^+e^- \rightarrow \Upsilon(4S)$	
5278.2±1.8 ±3.0) 12	³ ALBRECHT	87d ARG	$e^+e^- \rightarrow \Upsilon(4S)$	
$5278.6 \pm 0.8 \pm 2.0$)	BEBEK	87 CLEO	$e^+e^- \rightarrow \Upsilon(4S)$	
¹ CSORNA 00 u without beam ² AI BRECHT	ses fully recons constraint.	structed 526 $B^+ \rightarrow$	$J/\psi^{(\prime)}K^+\epsilon$	events and invariant m	asses
ALBRECHT 8 ³ Found using fu	B7D. Illy reconstruct	ed decays with $J/\psi($	1 <i>S</i>). ALBRE	CHT 87D assume m_{γ}	C(4S)
$= 10577 { m MeV}$			-	1	(10)

B^{\pm} MEAN LIFE

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

"OUR EVALUATION" is an average of the data listed below performed by the LEP B Lifetimes Working Group as described in our review "Production and Decay of bflavored Hadrons" in the B^{\pm} Section of the Listings. The averaging procedure takes into account correlations between the measurements and asymmetric lifetime errors.

VALUE (10^{-12} s)	EVTS	DOCUMENT ID	TECN	COMMENT
1.653±0.028 OUR EV	ALUATION			
$1.643 \!\pm\! 0.037 \!\pm\! 0.025$	4	⁴ ABBIENDI	99J OPAL	$e^+e^- \rightarrow Z$
$1.68\ \pm 0.07\ \pm 0.02$	Į	⁵ ABE	98b CDF	<i>р</i> рат 1.8 ТеV
$1.637 \!\pm\! 0.058 \!+\! 0.045 \\ - 0.043$	(^б АВЕ	98Q CDF	<i>рр</i> at 1.8 TeV

1.66	± 0.06	± 0.03		⁴ ACCIARRI	985 L3	$e^+e^- \rightarrow Z$
1.66	± 0.06	± 0.05		⁴ ABE	97J SLD	$e^+e^- \rightarrow Z$
1.58	± 0.09	± 0.04		⁶ BUSKULIC	96J ALEP	$e^+e^- \rightarrow Z$
1.58	$^{\mathrm{+0.21}}_{\mathrm{-0.18}}$	$^{+0.04}_{-0.03}$	94	⁵ BUSKULIC	96j ALEP	$e^+e^- \rightarrow Z$
1.61	± 0.16	± 0.12	6	^{5,7} ABREU	95Q DLPH	$e^+e^- \rightarrow Z$
1.72	± 0.08	± 0.06		⁸ ADAM	95 DLPH	$e^+e^- \rightarrow Z$
1.52	± 0.14	± 0.09		⁶ AKERS	95⊤ OPAL	$e^+e^- \rightarrow Z$
• • •	• We do	o not use the	followin	g data for average	s, fits, limits,	etc. • • •
1.56	± 0.13	± 0.06		⁶ ABE	96c CDF	Repl. by ABE 98Q
1.58	± 0.09	± 0.03		⁹ BUSKULIC	96J ALEP	$e^+e^- \rightarrow Z$
1.70	± 0.09			¹⁰ ADAM	95 DLPH	$e^+e^- \rightarrow Z$
1.61	± 0.16	± 0.05	148	⁵ ABE	94d CDF	Repl. by ABE 98B
1.30	$^{+0.33}_{-0.29}$	± 0.16	92	⁶ ABREU	93D DLPH	Sup. by ABREU 95Q
1.56	± 0.19	± 0.13	134	⁸ ABREU	93G DLPH	Sup. by ADAM 95
1.51	$^{+0.30}_{-0.28}$	$^{+0.12}_{-0.14}$	59	⁶ ACTON	93c OPAL	Sup. by AKERS 95T
1.47	$^{\rm +0.22}_{\rm -0.19}$	$^{+0.15}_{-0.14}$	77	⁶ BUSKULIC	93D ALEP	Sup. by BUSKULIC 96J

⁴ Data analyzed using charge of secondary vertex.

⁵ Measured mean life using fully reconstructed decays.

⁶Data analyzed using $D/D^*\ell X$ event vertices.

⁷ABREU 95Q assumes $B(B^0 \rightarrow D^{**-} \ell^+ \nu_{\ell}) = 3.2 \pm 1.7\%$.

⁸Data analyzed using vertex-charge technique to tag B charge.

⁹Combined result of $D/D^* \ell X$ analysis and fully reconstructed B analysis.

¹⁰ Combined ABREU 95Q and ADAM 95 result.

B+ DECAY MODES

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

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

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

		Scale factor/
Mode	Fraction (Γ_i/Γ)	Confidence level

HTTP://PDG.LBL.GOV

Semileptonic and leptonic modes

Γ_1	$\ell^+ u_\ell$ anything	$[a]$ (10.2 ± 0.9) %	
Γ_2^-	$\overline{D}^0 \ell^+ \nu_\ell$	[a] (2.15±0.22) %	
Г ₃	$\overline{D}^*(2007)^0 \ell^+ u_\ell$	$[a]$ (5.3 ± 0.8) %	
Γ ₄	$\overline{D}_1(2420)^0 \ell^+ \nu_\ell$	($5.6~\pm1.6$) × 10 ⁻³	
Γ ₅	$\overline{D}_{2}^{*}(2460)^{0}\ell^{+} u_{\ell}$	< 8	imes 10 ⁻³	CL=90%
Г ₆	$\pi^{0}e^{+}\nu_{e}$	< 2.2	imes 10 ⁻³	CL=90%
Γ ₇	$\omega \ell^+ \nu_\ell$	[a] < 2.1	imes 10 ⁻⁴	CL=90%
Г ₈	$\omega \mu^+ u_{\mu}$			
Г9	$ ho^0 \ell^+ \nu_\ell$	[a] < 2.1	imes 10 ⁻⁴	CL=90%
Γ ₁₀	$e^+ \nu_e$	< 1.5	imes 10 ⁻⁵	CL=90%
Γ_{11}	$\mu^+ u_{\mu}$	< 2.1	imes 10 ⁻⁵	CL=90%
Γ_{12}	$\tau^+ \nu_{\tau}$	< 5.7	imes 10 ⁻⁴	CL=90%
Γ ₁₃	$e^+ \nu_e \gamma$	< 2.0	imes 10 ⁻⁴	CL=90%
Γ_{14}	$\mu^+ \nu_\mu \gamma$	< 5.2	imes 10 ⁻⁵	CL=90%

 D, D^* , or D_s modes

	· · · · · · · · · · · · · · · · · · ·		
Γ_{15}	$\overline{D}{}^{0}\pi^{+}$	(5.3 \pm 0.5) $ imes$ 10 $^{-3}$	
Γ_{16}	$\overline{D}{}^0 \rho^+$	$(1.34\pm0.18)\%$	
Γ_{17}	$\overline{D}{}^0$ K ⁺	(2.9 ± 0.8) $ imes 10^{-4}$	
Γ_{18}	$\overline{D}{}^0 \pi^+ \pi^+ \pi^-$	$(1.1 \pm 0.4)\%$	
Γ ₁₉	$\overline{D}{}^0 \pi^+ \pi^+ \pi^-$ nonresonant	$(5 \pm 4) \times 10^{-3}$	
Γ_{20}	$\overline{D}{}^{0}\pi^{+} ho^{0}$	$(4.2 \pm 3.0) \times 10^{-3}$	
Γ_{21}	$\overline{D}^{0} a_{1}(1260)^{+}$	$(5 \pm 4) \times 10^{-3}$	
Γ_{22}	$D^{*}(2010)^{-}\pi^{+}\pi^{+}$	$(2.1 \pm 0.6) \times 10^{-3}$	
Γ_{23}	$D^-\pi^+\pi^+$	$< 1.4 \times 10^{-3}$	CL=90%
Γ ₂₄	$\overline{D}^{*}(2007)^{0}\pi^{+}$	(4.6 \pm 0.4) $ imes$ 10 $^{-3}$	
Γ ₂₅	$D^{*}(2010)^{+}\pi^{0}$	$< 1.7 \times 10^{-4}$	CL=90%
Γ ₂₆	$\overline{D}^{*}(2007)^{0}\rho^{+}$	$(1.55\pm0.31)\%$	
Γ_{27}	$\overline{D}^{*}(2007)^{0}\pi^{+}\pi^{+}\pi^{-}$	(9.4 ± 2.6) $ imes 10^{-3}$	
Γ ₂₈	$\overline{D}^{*}(2007)^{0} a_{1}(1260)^{+}$	(1.9 ± 0.5)%	
Γ ₂₉	$D^*(2010)^- \pi^+ \pi^+ \pi^0$	(1.5 ± 0.7)%	
Γ ₃₀	$D^{*}(2010)^{-}\pi^{+}\pi^{+}\pi^{+}\pi^{-}$	< 1 %	CL=90%
Γ ₃₁	$\overline{D}_{1}^{*}(2420)^{0}\pi^{+}$	(1.5 \pm 0.6) $ imes$ 10 $^{-3}$	S=1.3
Г ₃₂	$\overline{D}_{1}^{*}(2420)^{0}\rho^{+}$	< 1.4 $\times 10^{-3}$	CL=90%
Г ₃₃	$\overline{D}_{2}^{*}(2460)^{0}\pi^{+}$	$<$ 1.3 $\times 10^{-3}$	CL=90%
Γ ₃₄	$\overline{D}_{2}^{*}(2460)^{0} ho^{+}$	< 4.7 $\times 10^{-3}$	CL=90%
Γ ₃₅	$\overline{D}^{\overline{0}}D_{s}^{+}$	(1.3 ± 0.4)%	
Г ₃₆	$\overline{D}^0 D_{\xi}^{*+}$	$(9 \pm 4) \times 10^{-3}$	
Γ ₃₇	$\overline{D}^*(2007)^0 D_{\epsilon}^+$	(1.2 ± 0.5)%	
Γ ₃₈	$\overline{D}^{*}(2007)^{0}D^{*+}$	(2.7 ±1.0)%	
50	× / 5		

Г ₃₉	$\overline{D}^{*}(2007)^{0} D^{*}(2010)^{+}$	< 1.1	%	CL=90%
Γ ₄₀	$\overline{D}{}^{0} D^{*}(2010)^{+} +$	< 1.3	%	CL=90%
	$\overline{D}^{*}(2007)^{0} D^{+}$			
Γ ₄₁	$\overline{D}^0 D^+$	< 6.7	imes 10 ⁻³	CL=90%
Γ ₄₂	$D_{s}^{+}\pi^{0}$	< 2.0	imes 10 ⁻⁴	CL=90%
Γ ₄₃	$D_s^{*+}\pi^0$	< 3.3	imes 10 ⁻⁴	CL=90%
Γ ₄₄	$D_s^+ \eta$	< 5	imes 10 ⁻⁴	CL=90%
Г ₄₅	$D_{s}^{*+}\eta$	< 8	imes 10 ⁻⁴	CL=90%
Г ₄₆	$D_s^+ ho^0$	< 4	imes 10 ⁻⁴	CL=90%
Г ₄₇	$D_s^{*+} ho^0$	< 5	imes 10 ⁻⁴	CL=90%
Γ ₄₈	$D_s^+ \omega$	< 5	imes 10 ⁻⁴	CL=90%
Г ₄₉	$D_s^{*+}\omega$	< 7	imes 10 ⁻⁴	CL=90%
Γ ₅₀	$D_s^+ a_1(1260)^0$	< 2.2	imes 10 ⁻³	CL=90%
Γ ₅₁	$D_s^{*+}a_1(1260)^0$	< 1.6	imes 10 ⁻³	CL=90%
Γ ₅₂	$D_s^+\phi$	< 3.2	imes 10 ⁻⁴	CL=90%
Г ₅₃	$D_{s}^{*+}\phi$	< 4	imes 10 ⁻⁴	CL=90%
Γ ₅₄	$D_s^+\overline{K}^0$	< 1.1	imes 10 ⁻³	CL=90%
Γ ₅₅	$D_s^{*+}\overline{K}^0$	< 1.1	imes 10 ⁻³	CL=90%
Г ₅₆	$D_{s}^{+}\overline{K}^{*}(892)^{0}$	< 5	imes 10 ⁻⁴	CL=90%
Γ ₅₇	$D_{s}^{*+}\overline{K}^{*}(892)^{0}$	< 4	imes 10 ⁻⁴	CL=90%
Г ₅₈	$D_s^- \pi^+ K^+$	< 8	imes 10 ⁻⁴	CL=90%
Г ₅₉	$D_s^{*-}\pi^+K^+$	< 1.2	imes 10 ⁻³	CL=90%
Г ₆₀	$D_{s}^{-}\pi^{+}K^{*}(892)^{+}$	< 6	imes 10 ⁻³	CL=90%
Г ₆₁	$D_{s}^{*-}\pi^{+}K^{*}(892)^{+}$	< 8	imes 10 ⁻³	CL=90%
	Char	monium modes		
Г ₆₂	$J/\psi(1S)K^+$	(10.0 ±1.0	$) \times 10^{-4}$	
Г ₆₃	$J/\psi(1S)K^+\pi^+\pi^-$	($1.4~\pm0.6$	$) imes 10^{-3}$	
Г ₆₄	$J/\psi(1S)$ $K^*(892)^+$	(1.48 ± 0.2)	7) $\times 10^{-3}$	
Г ₆₅	$J/\psi(1S)\pi^+$	(5.1 ± 1.5	$) imes 10^{-5}$	
Г ₆₆	$J/\psi(1S) ho^+$	< 7.7	imes 10 ⁻⁴	CL=90%
Г ₆₇	$J/\psi(1S)$ a $_1(1260)^+$	< 1.2	imes 10 ⁻³	CL=90%
Г ₆₈	$\psi(2S)K^+$	($5.8~\pm1.0$	$) \times 10^{-4}$	
Г ₆₉	$\psi(2S)$ K*(892)+	< 3.0	imes 10 ⁻³	CL=90%
Γ ₇₀	$\psi(2S)K^+\pi^+\pi^-$	($1.9~\pm1.2$	$) imes$ 10 $^{-3}$	
Γ ₇₁	$\chi_{c1}(1P)K^+$	($1.0~\pm0.4$	$) \times 10^{-3}$	
Γ ₇₂	$\chi_{c1}(1P) {\it K}^{*}(892)^{+}$	< 2.1	imes 10 ⁻³	CL=90%

	<i>K</i> or <i>K</i> * m	odes		
Γ ₇₃	$K^0 \pi^+$	(2.3 ± 1.1)	1) $ imes$ 10 $^{-5}$	
Γ ₇₄	$K^+\pi^0$	< 1.6	imes 10 ⁻⁵	CL=90%
Γ ₇₅	$\eta^\prime {\it K}^+$	(6.5 ± 1.7	7) $ imes$ 10 $^{-5}$	
Γ ₇₆	$\eta' K^{*}(892)^{+}$	< 1.3	imes 10 ⁻⁴	CL=90%
Γ ₇₇	ηK^+	< 1.4	imes 10 ⁻⁵	CL=90%
Г ₇₈	η K*(892) $^+$	< 3.0	imes 10 ⁻⁵	CL=90%
Γ ₇₉	ωK^+	(1.5 $\substack{+0.7\\-0.6}$	$_{6}^{7}$) $ imes$ 10 $^{-5}$	
Г ₈₀	ω K*(892) $^+$	< 8.7	imes 10 ⁻⁵	CL=90%
Γ ₈₁	$K^{*}(892)^{0}\pi^{+}$	< 4.1	imes 10 ⁻⁵	CL=90%
Γ ₈₂	$K^{*}(892)^{+}\pi^{0}$	< 9.9	imes 10 ⁻⁵	CL=90%
Γ ₈₃	$K^+\pi^-\pi^+$ nonresonant	< 2.8	imes 10 ⁻⁵	CL=90%
Γ ₈₄	$K^-\pi^+\pi^+$ nonresonant	< 5.6	imes 10 ⁻⁵	CL=90%
Γ ₈₅	$K_1(1400)^0 \pi^+$	< 2.6	imes 10 ⁻³	CL=90%
Г ₈₆	$K_2^*(1430)^0 \pi^+$	< 6.8	imes 10 ⁻⁴	CL=90%
Г ₈₇	$\mathcal{K}^{+}\rho^{0}$	< 1.9	imes 10 ⁻⁵	CL=90%
Γ ₈₈	$\kappa^{0}\rho^{+}$	< 4.8	imes 10 ⁻⁵	CL=90%
Г ₈₉	$K^{*}(892)^{+}\pi^{+}\pi^{-}$	< 1.1	imes 10 ⁻³	CL=90%
Γ ₉₀	$K^{*}(892)^{+}\rho^{0}$	< 9.0	imes 10 ⁻⁴	CL=90%
Γ ₉₁	$K_1(1400)^+ \rho^0$	< 7.8	imes 10 ⁻⁴	CL=90%
Γ ₉₂	$K_2^{*}(1430)^+ \rho^0$	< 1.5	imes 10 ⁻³	CL=90%
Γ ₉₃	$K^{+}\overline{K}^{0}$	< 2.1	imes 10 ⁻⁵	CL=90%
Γ ₉₄	$K^+K^-\pi^+$ nonresonant	< 7.5	imes 10 ⁻⁵	CL=90%
Γ ₉₅	$K^+K^+\pi^-$ nonresonant	< 8.79	imes 10 ⁻⁵	CL=90%
Г ₉₆	$K^+ K^* (892)^0$	< 1.29	imes 10 ⁻⁴	CL=90%
Г ₉₇	$K^+K^-K^+$	< 2.0	imes 10 ⁻⁴	CL=90%
Г ₉₈	$K^+\phi$	< 5	imes 10 ⁻⁶	CL=90%
Г ₉₉	$K^+K^-K^+$ nonresonant	< 3.8	imes 10 ⁻⁵	CL=90%
Γ_{100}	$K^{*}(892)^{+}K^{+}K^{-}$	< 1.6	imes 10 ⁻³	CL=90%
Γ ₁₀₁	$K^*(892)^+ \phi$	< 4.1	imes 10 ⁻⁵	CL=90%
Γ ₁₀₂	$K_1(1400)^+ \phi$	< 1.1	imes 10 ⁻³	CL=90%
Γ ₁₀₃	$K_2^*(1430)^+ \phi$	< 3.4	imes 10 ⁻³	CL=90%
Γ ₁₀₄	$K^{+} f_0(980)$	< 8	imes 10 ⁻⁵	CL=90%
Γ ₁₀₅	$K^*(892)^+\gamma$	(5.7 ± 3.3)	3) $ imes$ 10 $^{-5}$	
Γ ₁₀₆	$K_1(1270)^+ \gamma$	< 7.3	imes 10 ⁻³	CL=90%
Γ ₁₀₇	$K_1(1400)^+ \gamma$	< 2.2	imes 10 ⁻³	CL=90%
Γ ₁₀₈	$K_{2}^{*}(1430)^{+}\gamma$	< 1.4	imes 10 ⁻³	CL=90%
Γ ₁₀₉	$K^{\overline{*}}(1680)^+ \gamma$	< 1.9	imes 10 ⁻³	CL=90%
Γ ₁₁₀	$K_{3}^{*}(1780)^{+}\gamma$	< 5.5	imes 10 ⁻³	CL=90%
Γ_{111}	$K_4^*(2045)^+ \gamma$	< 9.9	imes 10 ⁻³	CL=90%

Light	unflavore	ed meson	modes
-------	-----------	----------	-------

Г	$\pi^{+}\pi^{0}$	< 20	v 10 ⁻⁵	CL 000/
112	π π	< 2.0	× 10 °	CL=90%
I ₁₁₃	$\pi^+\pi^+\pi^-$	< 1.3	$\times 10^{-4}$	CL=90%
Г ₁₁₄	$ ho^0 \pi^+$	< 4.3	imes 10 ⁻⁵	CL=90%
Γ ₁₁₅	$\pi^+ f_0(980)$	< 1.4	imes 10 ⁻⁴	CL=90%
Γ_{116}	$\pi^+ f_2(1270)$	< 2.4	imes 10 ⁻⁴	CL=90%
Γ ₁₁₇	$\pi^+\pi^-\pi^+$ nonresonant	< 4.1	imes 10 ⁻⁵	CL=90%
Γ ₁₁₈	$\pi^{+}\pi^{0}\pi^{0}$	< 8.9	imes 10 ⁻⁴	CL=90%
Γ ₁₁₉	$ ho^+\pi^0$	< 7.7	imes 10 ⁻⁵	CL=90%
Γ ₁₂₀	$\pi^+\pi^-\pi^+\pi^0$	< 4.0	imes 10 ⁻³	CL=90%
Γ_{121}	$ ho^+ ho^0$	< 1.0	imes 10 ⁻³	CL=90%
Γ_{122}	$a_1(1260)^+ \pi^0$	< 1.7	imes 10 ⁻³	CL=90%
Γ ₁₂₃	$a_1(1260)^0 \pi^+$	< 9.0	imes 10 ⁻⁴	CL=90%
Γ ₁₂₄	$\omega \pi^+$	< 2.3	imes 10 ⁻⁵	CL=90%
Γ_{125}	$\omega \rho^+$	< 6.1	imes 10 ⁻⁵	CL=90%
Γ ₁₂₆	$\eta \pi^+$	< 1.5	imes 10 ⁻⁵	CL=90%
Γ ₁₂₇	$\eta' \pi^+$	< 3.1	imes 10 ⁻⁵	CL=90%
Γ ₁₂₈	$\eta' \rho^+$	< 4.7	imes 10 ⁻⁵	CL=90%
Γ ₁₂₉	$\eta \rho^+$	< 3.2	$\times 10^{-5}$	CL=90%
Γ ₁₃₀	$\phi \pi^+$	< 5	imes 10 ⁻⁶	CL=90%
Γ ₁₃₁	$\phi \rho^+$	< 1.6	imes 10 ⁻⁵	
Γ_{132}	$\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}$	< 8.6	$ imes 10^{-4}$	CL=90%
Γ ₁₃₃	$ ho_{1}^{0}a_{1}(1260)^{+}$	< 6.2	imes 10 ⁻⁴	CL=90%
Γ ₁₃₄	$ ho^{0}$ a_2(1320) $^{+}$	< 7.2	imes 10 ⁻⁴	CL=90%
Γ ₁₃₅	$\pi^{+}\pi^{+}\pi^{+}\pi^{-}\pi^{-}\pi^{0}$	< 6.3	imes 10 ⁻³	CL=90%
Γ ₁₃₆	$a_1(1260)^+ a_1(1260)^0$	< 1.3	%	CL=90%

Charged particle (h^{\pm}) modes

	$h^{\pm}={\it K}^{\pm}$ or π^{\pm}		
Γ ₁₃₇	$h^+ \pi^0$	(1.6 $\substack{+0.7\\-0.6}$	$) imes 10^{-5}$
Г ₁₃₈	ωh^+	2.50	imes 10 ⁻⁵

Baryon modes

Γ ₁₃₉	$p\overline{p}\pi^+$	< 1.6	imes 10 ⁻⁴	CL=90%
Γ ₁₄₀	$p \overline{oldsymbol{p}} \pi^+$ nonresonant	< 5.3	imes 10 ⁻⁵	CL=90%
Γ_{141}	$p\overline{p}\pi^+\pi^+\pi^-$	< 5.2	imes 10 ⁻⁴	CL=90%
Γ ₁₄₂	$p \overline{p} K^+$ nonresonant	< 8.9	imes 10 ⁻⁵	CL=90%
Г ₁₄₃	pΛ	< 2.6	imes 10 ⁻⁶	CL=90%
Γ ₁₄₄	$p\overline{\Lambda}\pi^+\pi^-$	< 2.0	imes 10 ⁻⁴	CL=90%

Γ_{145}	$\overline{\Delta}^0 p$	<	3.8	imes 10 ⁻⁴	CL=90%
Γ ₁₄₆	$\Delta^{++}\overline{ ho}$	<	1.5	imes 10 ⁻⁴	CL=90%
Γ_{147}	$\overline{\Lambda}_{c}^{-} p \pi^{+}$	(6.2 ± 2.7)	imes 10 ⁻⁴	
Γ ₁₄₈	$\overline{\Lambda}_{c}^{-} p \pi^{+} \pi^{0}$	<	3.12	imes 10 ⁻³	CL=90%
Γ ₁₄₉	$\overline{\Lambda}_{c}^{-} p \pi^{+} \pi^{+} \pi^{-}$	<	1.46	imes 10 ⁻³	CL=90%
Γ_{150}	$\overline{\Lambda}_{c}^{-} p \pi^{+} \pi^{+} \pi^{-} \pi^{0}$	<	1.34	%	CL=90%

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

Γ ₁₅₁	$\pi^+ e^+ e^-$	B1	< 3.9	imes 10 ⁻³	CL=90%
Γ ₁₅₂	$\pi^+ \mu^+ \mu^-$	B1	< 9.1	imes 10 ⁻³	CL=90%
Γ ₁₅₃	$K^+ e^+ e^-$	B1	< 6	imes 10 ⁻⁵	CL=90%
Γ ₁₅₄	$K^+ \mu^+ \mu^-$	B1	< 5.2	imes 10 ⁻⁶	CL=90%
Γ ₁₅₅	$K^{*}(892)^{+}e^{+}e^{-}$	B1	< 6.9	imes 10 ⁻⁴	CL=90%
Γ ₁₅₆	$K^{*}(892)^{+}\mu^{+}\mu^{-}$	B1	< 1.2	imes 10 ⁻³	CL=90%
Γ ₁₅₇	$\pi^+ e^+ \mu^-$	LF	< 6.4	imes 10 ⁻³	CL=90%
Γ ₁₅₈	$\pi^+ e^- \mu^+$	LF	< 6.4	imes 10 ⁻³	CL=90%
Γ ₁₅₉	$K^+ e^+ \mu^-$	LF	< 6.4	imes 10 ⁻³	CL=90%
Γ ₁₆₀	$K^+ e^- \mu^+$	LF	< 6.4	imes 10 ⁻³	CL=90%
Г ₁₆₁	$\pi^- e^+ e^+$	L	< 3.9	imes 10 ⁻³	CL=90%
Γ ₁₆₂	$\pi^- \mu^+ \mu^+$	L	< 9.1	imes 10 ⁻³	CL=90%
Γ ₁₆₃	$\pi^- e^+ \mu^+$	LF	< 6.4	imes 10 ⁻³	CL=90%
Г ₁₆₄	$K^- e^+ e^+$	L	< 3.9	imes 10 ⁻³	CL=90%
Γ ₁₆₅	$\mathcal{K}^- \mu^+ \mu^+$	L	< 9.1	imes 10 ⁻³	CL=90%
Γ ₁₆₆	${\sf K}^- {\sf e}^+ \mu^+$	LF	< 6.4	imes 10 ⁻³	CL=90%

[a] An ℓ indicates an e or a μ mode, not a sum over these modes.

B+ BRANCHING RATIOS

$\Gamma(\ell^+ u_\ell ext{anything}) / \Gamma_{ ext{total}}$					Г1/Г
VALUE	DOCUMENT ID		TECN	COMMENT	
$0.1025 \pm 0.0057 \pm 0.0065$	¹¹ ARTUSO	97	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$	
\bullet \bullet \bullet We do not use the followi	ng data for average	es, fits	, limits,	etc. • • •	
$0.101 \ \pm 0.018 \ \pm 0.015$	ATHANAS	94	CLE2	Sup. by ARTUSO	97
¹¹ ARTUSO 97 uses partial re branching ratio from BARIS	econstruction of B H 96B (0.1049 \pm 0	→ .0017	$D^*\ell u_\ell \pm 0.004$	and inclusive semile 3).	eptonic
$\Gamma(\overline{D}^{0}\ell^{+}\nu_{\ell})/\Gamma_{\text{total}}$ $\ell = e \text{ or } \mu, \text{ not sum over}$	e and μ modes.				Γ_2/Γ
VALUE	DOCUMENT ID		TECN	COMMENT	
0.0215±0.0022 OUR AVERAGE					
$0.0221\!\pm\!0.0013\!\pm\!0.0019$	¹² BARTELT	99	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$	
$0.016\ \pm 0.006\ \pm 0.003$	¹³ FULTON	91	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$	
$\bullet~\bullet~$ We do not use the followi	ng data for average	es, fits	, limits,	etc. • • •	
$0.0194 \!\pm\! 0.0015 \!\pm\! 0.0034$	¹⁴ ATHANAS	97	CLE2	Repl. by BARTEL	Т 99
HTTP://PDG.LBL.GOV	Page 7		Creat	ed: 12/18/2000	15:06

Γ₄/Γ

 $^{12}\operatorname{Assumes}$ equal production of B^+ and B^0 at the $\varUpsilon(4S).$

¹³FULTON 91 assumes equal production of $B^0 \overline{B}{}^0$ and $B^+ B^-$ at the $\Upsilon(4S)$.

¹⁴ ATHANAS 97 uses missing energy and missing momentum to reconstruct neutrino.

$\Gamma(\overline{D}^*(2007)^0\ell^+\nu_\ell)/\Gamma_{\rm to}$	tal					Г ₃ /Г
$\ell = e$ or μ , not sum c	over e an	d μ modes.				
VALUE	EVTS	DOCUMENT ID		TECN	COMMENT	
0.053 ± 0.008 OUR AVER	AGE					
$0.0513 \!\pm\! 0.0054 \!\pm\! 0.0064$	302	¹⁵ BARISH	95	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$0.066\ \pm 0.016\ \pm 0.015$		¹⁶ ALBRECHT	9 2C	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
\bullet \bullet We do not use the following	llowing d	lata for averages, fit	ts, lin	nits, etc		
seen	398	¹⁷ SANGHERA	93	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$0.041 \ \pm 0.008 \ \begin{array}{c} + \ 0.008 \\ - \ 0.009 \end{array}$		¹⁸ FULTON	91	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$0.070\ \pm 0.018\ \pm 0.014$		¹⁹ ANTREASYAN	I 90 в	CBAL	$e^+e^- \rightarrow$	$\Upsilon(4S)$
¹⁵ BARISH 95 use $B(D^0 - (63.6 \pm 2.3 \pm 3.3)\%)$.	$\rightarrow K^{-}\pi$	$(+) = (3.91 \pm 0.08)$	3 ± 0	0.17)% a	and B(D^{*0} -	$\rightarrow D^0 \pi^0$)

¹⁶ ALBRECHT 92C reports $0.058 \pm 0.014 \pm 0.013$. We rescale using the method described in STONE 94 but with the updated PDG 94 B($D^0 \rightarrow K^- \pi^+$). Assumes equal production of $B^0 \overline{B}{}^0$ and $B^+ B^-$ at the $\Upsilon(4S)$.

¹⁷ Combining $\overline{D}^{*0}\ell^+\nu_{\ell}$ and $\overline{D}^{*-}\ell^+\nu_{\ell}$ SANGHERA 93 test V-A structure and fit the decay angular distributions to obtain $A_{FB} = 3/4*(\Gamma^- - \Gamma^+)/\Gamma = 0.14 \pm 0.06 \pm 0.03$. Assuming a value of V_{cb} , they measure V, A_1 , and A_2 , the three form factors for the $D^*\ell\nu_{\ell}$ decay, where results are slightly dependent on model assumptions.

- ¹⁸ Assumes equal production of $B^0 \overline{B}{}^0$ and $B^+ B^-$ at the $\Upsilon(4S)$. Uncorrected for D and D^* branching ratio assumptions.
- ¹⁹ANTREASYAN 90B is average over B and $\overline{D}^*(2010)$ charge states.

$\Gamma(\overline{D}_1(2420)^0\ell^+\nu_\ell)/\Gamma_{\text{total}}$

 $\begin{array}{c} \underline{VALUE} & \underline{DOCUMENT \ ID} & \underline{TECN} & \underline{COMMENT} \\ \hline 0.0056 \pm 0.0013 \pm 0.0009 & 2^0 \\ \hline 0 \\ ANASTASSOV \ 98 \\ result \\ is \\ derived from the measurement of \\ B(\overline{D}_1^0 + \nu_\ell) \times B(\overline{D}_1^0 \rightarrow D^{*+}\pi^-) = (0.373 \pm 0.085 \pm 0.052 \pm 0.024)\% \\ B(\overline{D}_1^0 \rightarrow D^{*+}\pi^-) = 67\%, \\ where the third error includes theoretical uncertainties. \\ \hline \Gamma(\overline{D}_2^*(2460)^0 \ell^+ \nu_\ell) / \Gamma_{total} \\ \hline \Gamma_5 / \Gamma \end{array}$

VALUE	<u>CL%</u>	DOCUMENT ID	TECN	COMMENT
<8 × 10 ⁻³	90	²¹ ANASTASSOV 98	CLE2	$e^+e^- ightarrow ~\Upsilon(4S)$
$ \begin{array}{c} ^{21} \text{ANASTASSOV} 98 \\ \overline{D}_2^{*0} \ell^+ \nu_\ell) \times B(\overline{D}_2^{*0} + \ell^+) \\ = 20\%. \end{array} $	result $\rightarrow D^{*+}$	is derived from the π^-) $<$ 0.16% at 90% CL	e meau - by assu	usrement of $B(B^+ \rightarrow m)$ uming $B(\overline{D}_2^{*0} \rightarrow D^{*+} \pi^-)$

$\Gamma(\pi^0 e^+ \nu_e) / \Gamma_{\text{total}}$						Γ_6/Γ
VALUE	<u>CL%</u>	DOCUMENT ID	TECN	COMMENT		
<0.0022	90	ANTREASYAN 90B	CBAL	$e^+e^- \rightarrow$	$\Upsilon(4S)$	

$v_{alue} = c \ or \ \mu, \ not$	CL%	DOCUMENT ID		TECN	COMMENT	
<2.1 × 10 ⁻⁴	90	²² BEAN	93 B	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
²² BEAN 93B limit s $\Gamma(\rho^0 \ell^+ \nu_\ell)$ and Γ 90% CL for B^+ – An upper limit on	et using IS $(\rho^- \ell^+ \nu_\ell)$ $\rightarrow \omega \ell^+ \nu_\ell$. $ V_{ub}/V_{cb}$	${\rm GW}$ Model. Using) with this result, th The range correspond ${\rm G} < 0.8{-}0.13$ at 90	isospir ney ob onds to % CL	n and th tain a li o the IS is deriv	ne quark mod imit <(1.6–2 GW, WSB, a red as well.	del to combin 2.7) $ imes$ 10 ⁻⁴ a nd KS models
$\Gamma(\omega\mu^+\nu_\mu)/\Gamma_{\text{total}}$		DOCUMENT ID		TECN		Г ₈ /
• • • We do not use	the followi	ing data for average	s fits	limits	etc • • •	
	the followi		01 <i>c</i>			
²³ In ALBRECHT 91	LC, one eve	ent is fully reconstru	ucted	providin	ng evidence f	or the $b \rightarrow$
transition.	·	5		•	0	
$\Gamma(ho^{0}\ell^{+} u_{\ell})/\Gamma_{ ext{total}}$ $\ell = e ext{ or } \mu, ext{ not}$	sum over	e and μ modes.				Г 9/
VALUE	<u> </u>	DOCUMENT ID		<u>TECN</u>	<u>COMMENT</u>	22(1.2)
	90	²⁴ BEAN	93 B	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
<2.1 × 10⁺ ²⁴ BEAN 93B limit s $\Gamma(\omega^0 \ell^+ \nu_\ell)$ and l at 90% CL for B ⁻	et using IS $\Gamma(\rho^- \ell^+ \nu_\ell + \rho_0 \rho_\ell)$	GGW Model. Using p(z) with this result, $p(z^+ u_{ ho}$. The range co	isospir they c orrespo	n and th obtain a onds to	ne quark model in a limit $<(1.6)$ the ISGW,	del to combin 5 –2.7) $ imes$ 10^- WSB, and K
<2.1 × 10 ⁻⁷ ²⁴ BEAN 93B limit s $\Gamma(\omega^0 \ell^+ \nu_\ell)$ and l at 90% CL for B ⁻¹ models. An upper $\Gamma(e^+ \nu_e)/\Gamma_{total}$ VALUE	et using IS $\Gamma(\rho^{-}\ell^{+}\nu_{\ell}$ $+ \rightarrow \rho^{0}\ell$ $r \text{ limit on }$ $CL\%$	GW Model. Using ν_{ℓ}) with this result, $\nu_{\ell} + \nu_{\ell}$. The range co $V_{ub}/V_{cb} < 0.8-0.$ DOCUMENT ID	isospir they c orresp 13 at	n and th obtain a onds to 90% Cl <i>TECN</i>	ne quark mod a limit <(1.6 the ISGW, L is derived a COMMENT	del to combin 5–2.7) \times 10 [–] WSB, and K as well. $\Gamma_{10}/$
<2.1 × 10 ⁻⁷ ²⁴ BEAN 93B limit s $\Gamma(\omega^0 \ell^+ \nu_\ell)$ and l at 90% CL for B [*] models. An upper $\Gamma(e^+ \nu_e)/\Gamma_{total}$ <u>VALUE</u> <1.5 × 10 ⁻⁵	et using IS $\Gamma(\rho^{-}\ell^{+}\nu_{\ell}^{+} \rightarrow \rho^{0}\ell^{-} \ell^{-} \mu_{\ell}^{-} $	GW Model. Using (2) with this result, $ \dot{\nu}^+ \nu_\ell$. The range co $ V_{ub}/V_{cb} < 0.8-0.$ <u>DOCUMENT ID</u> ARTUSO	isospir they c orrespo 13 at 95	n and th obtain a onds to 90% Cl <u>TECN</u> CLE2	the quark mode is a limit $<(1.6)$ the ISGW, L is derived a $\frac{COMMENT}{e^+e^-} \rightarrow c^+e^-$	del to combin 5–2.7) $ imes$ 10 [–] WSB, and K as well. Γ_{10}/Γ $\Upsilon(4S)$
<2.1 × 10 ⁻⁷ ²⁴ BEAN 93B limit s $\Gamma(\omega^0 \ell^+ \nu_\ell)$ and l at 90% CL for B ⁻¹ models. An upper $\Gamma(e^+ \nu_e)/\Gamma_{total}$ <u>VALUE</u> <1.5 × 10 ⁻⁵ $\Gamma(\mu^+ \nu_\mu)/\Gamma_{total}$ VALUE	et using IS $\Gamma(\rho^{-}\ell^{+}\nu_{\ell}^{+} \rightarrow \rho^{0}\ell^{-}$ r limit on $\underline{CL\%}$ 90	GW Model. Using $ \nu = \nu_{\ell} $. The range co $ \nu = \nu_{\ell} $. The range co $ \nu_{ub}/ V_{cb} < 0.8-0.$ <u>DOCUMENT ID</u> ARTUSO	isospir they c orresp 13 at 95	n and th obtain a onds to 90% Cl <u>TECN</u> TECN	the quark model of the quark model of the quark model of the	del to combin 5–2.7) \times 10 [–] WSB, and K as well. Γ_{10}/r $\Upsilon(4S)$ Γ_{11}/r
<2.1 × 10 ⁻⁷ ²⁴ BEAN 93B limit s $\Gamma(\omega^0 \ell^+ \nu_\ell)$ and l at 90% CL for B ⁻¹ models. An upper $\Gamma(e^+ \nu_e)/\Gamma_{\text{total}}$ <u>VALUE</u> <1.5 × 10 ⁻⁵ $\Gamma(\mu^+ \nu_\mu)/\Gamma_{\text{total}}$ <u>VALUE</u> <2.1 × 10 ⁻⁵	et using IS $\Gamma(\rho^{-}\ell^{+}\nu_{\ell}^{+}+ \rightarrow \rho^{0}\ell^{-})$ r limit on $ $ $\frac{CL\%}{90}$	GW Model. Using (2) with this result, $ V_{\ell} $. The range constraints $ V_{ub}/V_{cb} < 0.8-0.$ <u>DOCUMENT ID</u> ARTUSO <u>DOCUMENT ID</u> ARTUSO	isospir they c orrespo 13 at 95 95	n and the obtain a onds to 90% Cl <u>TECN</u> CLE2 <u>TECN</u> CLE2	the quark model init <(1.6 the ISGW, L is derived a $\frac{COMMENT}{e^+e^-} \rightarrow \frac{COMMENT}{e^+e^-}$	del to combin 5-2.7) \times 10 ⁻ WSB, and K as well. Γ_{10}/Γ $\Upsilon(4S)$ Γ_{11}/Γ
<2.1 × 10 ⁻⁷ ²⁴ BEAN 93B limit s $\Gamma(\omega^0 \ell^+ \nu_\ell)$ and 1 at 90% CL for B ⁻¹ models. An upper $\Gamma(e^+ \nu_e)/\Gamma_{total}$ <u>VALUE</u> <1.5 × 10 ⁻⁵ $\Gamma(\mu^+ \nu_\mu)/\Gamma_{total}$ <u>VALUE</u> <2.1 × 10 ⁻⁵ $\Gamma(\tau^+ \nu_\tau)/\Gamma_{total}$	et using IS $\Gamma(\rho^{-}\ell^{+}\nu_{\ell}^{+} \rightarrow \rho^{0}\ell^{-} \ell^{+}\nu_{\ell}^{-}$ r limit on $\frac{CL\%}{90}$	GW Model. Using (2) with this result, $ V^+ \nu_\ell$. The range co $ V_{ub}/V_{cb} < 0.8-0.$ <u>DOCUMENT ID</u> ARTUSO <u>DOCUMENT ID</u> ARTUSO	isospir they o orrespo 13 at 95 95	n and th obtain a onds to 90% Cl <u>TECN</u> CLE2 <u>TECN</u> CLE2	the quark model of the limit $<(1.6)$ the ISGW, L is derived as $\frac{COMMENT}{e^+e^-} \rightarrow \frac{COMMENT}{e^+e^-} \rightarrow \frac{COMMENT}{e^+e^-}$	del to combin 5–2.7) × 10 [–] WSB, and K as well. Γ_{10}/Γ $\Upsilon(4S)$ Γ_{11}/Γ $\Upsilon(4S)$ Γ_{12}/Γ
<2.1 × 10 ⁻⁷ ²⁴ BEAN 93B limit s $\Gamma(\omega^0 \ell^+ \nu_\ell)$ and l at 90% CL for B ⁻¹ models. An upper $\Gamma(e^+ \nu_e)/\Gamma_{total}$ <u>VALUE</u> <1.5 × 10 ⁻⁵ $\Gamma(\mu^+ \nu_\mu)/\Gamma_{total}$ <u>VALUE</u> <2.1 × 10 ⁻⁵ $\Gamma(\tau^+ \nu_\tau)/\Gamma_{total}$ <u>VALUE</u> VALUE	et using IS $\Gamma(\rho^{-}\ell^{+}\nu_{\ell}^{+}+ \rightarrow \rho^{0}\ell^{-}$ r limit on $\frac{CL\%}{90}$ $\frac{CL\%}{90}$	GW Model. Using (2) with this result, $ V_{\ell} $. The range co $ V_{ub}/V_{cb} < 0.8-0.$ <u>DOCUMENT ID</u> ARTUSO <u>DOCUMENT ID</u> ARTUSO	isospir they c orresp 13 at 95 95	n and the obtain a conds to 90% Cl 7ECN CLE2 <u>TECN</u> CLE2 <u>TECN</u>	the quark mode in the quark mode in the isolation of the	del to combin 5–2.7) × 10 WSB, and K as well. Γ_{10}/Γ $\Upsilon(4S)$ Γ_{11}/Γ $\Upsilon(4S)$ Γ_{12}/Γ
<2.1 × 10 ⁻⁷ ²⁴ BEAN 93B limit s $\Gamma(\omega^0 \ell^+ \nu_\ell)$ and 1 at 90% CL for B ⁻¹ models. An upper $\Gamma(e^+ \nu_e)/\Gamma_{total}$ <u>VALUE</u> <1.5 × 10 ⁻⁵ $\Gamma(\mu^+ \nu_\mu)/\Gamma_{total}$ <u>VALUE</u> <2.1 × 10 ⁻⁵ $\Gamma(\tau^+ \nu_\tau)/\Gamma_{total}$ <u>VALUE</u> <5.7 × 10 ⁻⁴	et using IS $\Gamma(\rho^{-}\ell^{+}\nu_{\ell}^{+} \rightarrow \rho^{0}\ell^{-}_{\ell}^{+} \mu_{\ell}^{-}_{\ell}^{-} \mu_{\ell}^{-} \mu_$	GW Model. Using (2) with this result, $ V_{\ell} $. The range co $ V_{ub}/V_{cb} < 0.8-0.$ <u>DOCUMENT ID</u> ARTUSO <u>DOCUMENT ID</u> ARTUSO <u>25</u> ACCIARRI	isospir they o orrespo 13 at 95 95 95	n and the obtain a onds to 90% Cl <u>TECN</u> CLE2 <u>TECN</u> CLE2 <u>TECN</u> L3	the quark model init <(1.6 the ISGW, L is derived a $\frac{COMMENT}{e^+e^-} \rightarrow \frac{COMMENT}{e^+e^-} \rightarrow \frac{COMMENT}{e^+e^-} \rightarrow \frac{COMMENT}{e^+e^-} \rightarrow \frac{COMMENT}{e^+e^-} \rightarrow \frac{COMMENT}{e^+e^-} \rightarrow 0$	del to combin $5-2.7) \times 10^{-1}$ WSB, and K as well. Γ_{10}/Γ $\Upsilon(4S)$ Γ_{11}/Γ $\Upsilon(4S)$ Γ_{12}/Γ Z
<2.1 × 10 ⁻⁷ ²⁴ BEAN 93B limit s $\Gamma(\omega^0 \ell^+ \nu_\ell)$ and l at 90% CL for B ⁻¹ models. An upper $\Gamma(e^+ \nu_e)/\Gamma_{total}$ <u>VALUE</u> <1.5 × 10 ⁻⁵ $\Gamma(\mu^+ \nu_\mu)/\Gamma_{total}$ <u>VALUE</u> <2.1 × 10 ⁻⁵ $\Gamma(\tau^+ \nu_\tau)/\Gamma_{total}$ <u>VALUE</u> <5.7 × 10 ⁻⁴ • • We do not use	et using IS $\Gamma(\rho^{-}\ell^{+}\nu_{\ell}^{+}+ \rightarrow \rho^{0}\ell^{-})$ r limit on $ $ $\frac{CL\%}{90}$ $\frac{CL\%}{90}$ the followid	GW Model. Using (2) with this result, $ V_{\ell} $. The range constraints $ V_{ub}/V_{cb} < 0.8-0.$ $\frac{DOCUMENT ID}{ARTUSO}$ $\frac{DOCUMENT ID}{ARTUSO}$ $\frac{DOCUMENT ID}{25}$ ACCIARRI ing data for average	isospir they o orrespo 13 at 95 95 95 95 97F es, fits	n and the obtain a onds to 90% Cl <u>TECN</u> CLE2 <u>TECN</u> CLE2 <u>TECN</u> L3 , limits,	the quark mode a limit <(1.6 the ISGW, L is derived a $\frac{COMMENT}{e^+e^-} \rightarrow \frac{COMMENT}{e^+e^-} \rightarrow \frac{COMMENT}{e^+e^-} \rightarrow e^+e^- \rightarrow e^+e^- \rightarrow e^+e^- \rightarrow e^+e^-$	del to combin $5-2.7) \times 10^{-1}$ WSB, and K as well. Γ_{10}/Γ $\Upsilon(4S)$ Γ_{11}/Γ $\Upsilon(4S)$ Γ_{12}/Γ Z
<2.1 × 10 ⁻⁷ ²⁴ BEAN 93B limits $\Gamma(\omega^0 \ell^+ \nu_\ell)$ and last 90% CL for B ⁻¹ models. An upper $\Gamma(e^+ \nu_e) / \Gamma_{total}$ <a block"="" center-style="text-align:</td><td>et using IS
<math display=" href="https://www.climater-style=" text-align:="">\Gamma(\rho^{-}\ell^{+}\nu_{\ell}^{+} \rightarrow \rho^{0}\ell^{-}_{\ell}^{+} \mu_{\ell}^{-}_{\ell}^{+} \mu_{\ell}^{-}_{\ell}^{+} \mu_{\ell}^{-}_{\ell}^{-}_{\ell}^{-} \mu_{\ell}^{-}_{\ell}^	GW Model. Using (2) with this result, $ +\nu_{\ell}$. The range co $ \nu_{ub}/\nu_{cb} < 0.8-0.$ <u>DOCUMENT ID</u> ARTUSO <u>DOCUMENT ID</u> ARTUSO <u>DOCUMENT ID</u> 25 ACCIARRI ing data for average 26 ALBRECHT	isospir they correspondent 13 at 95 95 95 97F es, fits 95D	n and the obtain a conds to 90% Cl 70% CL 70\% CL 70	the quark mode a limit <(1.6 the ISGW, L is derived a $\frac{COMMENT}{e^+e^-} \rightarrow$ $\frac{COMMENT}{e^+e^-} \rightarrow$ $\frac{COMMENT}{e^+e^-} \rightarrow$ etc. ••• $e^+e^- \rightarrow$	del to combin $5-2.7) \times 10^{-1}$ WSB, and K as well. Γ_{10}/Γ $\Upsilon(4S)$ Γ_{11}/Γ $\Upsilon(4S)$ Γ_{12}/Γ Z $\Upsilon(4S)$	
</td <td>et using IS $\Gamma(\rho^{-}\ell^{+}\nu_{\ell}^{+} \rightarrow \rho^{0}\ell^{+}_{\ell}^{+} \rightarrow \rho^{0}\ell^{-}_{\ell}^{+}_{\ell}^{-}$</td> <td>iGW Model. Using (2) with this result, $+ \nu_{\ell}$. The range co $V_{ub}/V_{cb} < 0.8-0.$ <u>DOCUMENT ID</u> ARTUSO <u>DOCUMENT ID</u> ARTUSO <u>DOCUMENT ID</u> 25 ACCIARRI ing data for average ²⁶ ALBRECHT ARTUSO</td> <td>isospir they o orrespo 13 at 95 95 95 97F es, fits 95D 95</td> <td>n and the potain a onds to 90% Cl <u>TECN</u> CLE2 <u>TECN</u> L3 , limits, ARG CLE2</td> <td>the quark model init <(1.6) the ISGW, L is derived a $\frac{COMMENT}{e^+e^-} \rightarrow \frac{COMMENT}{e^+e^-} \rightarrow \frac{COMMENT}{e^+e^-} \rightarrow etc. \bullet \bullet \bullet e^+e^- \rightarrow$</td> <td>del to combin $5-2.7) \times 10^{-1}$ WSB, and K as well. Γ_{10}/Γ $\Upsilon(4S)$ Γ_{11}/Γ $\Upsilon(4S)$ Γ_{12}/Γ Z $\Upsilon(4S)$ $\Upsilon(4S)$ $\Upsilon(4S)$</td>	et using IS $\Gamma(\rho^{-}\ell^{+}\nu_{\ell}^{+} \rightarrow \rho^{0}\ell^{+}_{\ell}^{+} \rightarrow \rho^{0}\ell^{-}_{\ell}^{+}_{\ell}^{-}$	iGW Model. Using (2) with this result, $ + \nu_{\ell}$. The range co $ V_{ub}/V_{cb} < 0.8-0.$ <u>DOCUMENT ID</u> ARTUSO <u>DOCUMENT ID</u> ARTUSO <u>DOCUMENT ID</u> 25 ACCIARRI ing data for average ²⁶ ALBRECHT ARTUSO	isospir they o orrespo 13 at 95 95 95 97F es, fits 95D 95	n and the potain a onds to 90% Cl <u>TECN</u> CLE2 <u>TECN</u> L3 , limits, ARG CLE2	the quark model init <(1.6) the ISGW, L is derived a $\frac{COMMENT}{e^+e^-} \rightarrow \frac{COMMENT}{e^+e^-} \rightarrow \frac{COMMENT}{e^+e^-} \rightarrow etc. \bullet \bullet \bullet e^+e^- \rightarrow $	del to combin $5-2.7) \times 10^{-1}$ WSB, and K as well. Γ_{10}/Γ $\Upsilon(4S)$ Γ_{11}/Γ $\Upsilon(4S)$ Γ_{12}/Γ Z $\Upsilon(4S)$ $\Upsilon(4S)$ $\Upsilon(4S)$
	et using IS $\Gamma(\rho - \ell + \nu_{\ell} + \rightarrow \rho 0 \ell + \rho 0 + \rho 0 \ell + \rho 0 - \rho 0 -$	GW Model. Using (2) with this result, $ +\nu_{\ell}$. The range co $ \nu_{ub}/\nu_{cb} < 0.8-0.$ $\frac{DOCUMENT ID}{ARTUSO}$ $\frac{DOCUMENT ID}{ARTUSO}$ $\frac{DOCUMENT ID}{25}$ ACCIARRI ing data for average 2^{6} ALBRECHT ARTUSO 2^{7} BUSKULIC	isospir they o orrespo 13 at 95 95 95 95 95 95 95 95	n and the potain a onds to 90% Cl <u>TECN</u> CLE2 <u>TECN</u> CLE2 <u>TECN</u> L3 , limits, ARG CLE2 ALEP	the quark mode a limit <(1.6 the ISGW, L is derived a $\frac{COMMENT}{e^+e^-} \rightarrow$ $\frac{COMMENT}{e^+e^-} \rightarrow$ etc. •• $e^+e^- \rightarrow$ $e^+e^- \rightarrow$ $e^+e^- \rightarrow$ $e^+e^- \rightarrow$	del to combin 5–2.7) × 10 WSB, and K as well. Γ_{10}/Γ $\Upsilon(4S)$ Γ_{11}/Γ $\Upsilon(4S)$ Γ_{12}/Γ Z $\Upsilon(4S)$ $\Upsilon(4S)$ $\Upsilon(4S)$ Z

 $\mathsf{HTTP:}//\mathsf{PDG.LBL.GOV}$

$\Gammaig(e^+ u_e \gammaig) / \Gamma_{ ext{total}}$						Γ ₁₃ /	Г
VALUE	CL%	DOCUMENT ID		TECN	COMMENT		
<2.0 × 10 ⁻⁴	90	28 BROWDER	97	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$	

 28 BROWDER 97 uses the hermiticity of the CLEO II detector to reconstruct the neutrino energy and momentum.

$\Gamma(\mu^+ u_{\mu}\gamma)/\Gamma_{ ext{total}}$						Г ₁₄ /Г
VALUE	CL%	DOCUMENT ID		TECN	<u>COMMENT</u>	
<5.2 × 10 ⁻⁵	90	²⁹ BROWDER	97	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$

 29 BROWDER 97 uses the hermiticity of the CLEO II detector to reconstruct the neutrino energy and momentum.

$\Gamma(\overline{D}{}^{0}\pi^{+})/\Gamma_{\text{total}}$		Г	L5/Γ
VALUE	EVTS	DOCUMENT ID TECN COMMENT	
0.0053 ± 0.0005 OUR AVERA	GE		
$0.0055 \!\pm\! 0.0004 \!\pm\! 0.0005$	304	30 ALAM 94 CLE2 $e^+e^- \rightarrow \Upsilon(4S)$	5)
$0.0050 \!\pm\! 0.0007 \!\pm\! 0.0006$	54	31 BORTOLETTO92 CLEO $e^+e^- ightarrow ~ \Upsilon$ (45	5)
$0.0054 \substack{+0.0018 + 0.0012 \\ -0.0015 - 0.0009}$	14	³² BEBEK 87 CLEO $e^+e^- \rightarrow \Upsilon(4S)$	5)
• • • We do not use the follow	owing	data for averages, fits, limits, etc. \bullet \bullet	
$0.0020 \!\pm\! 0.0008 \!\pm\! 0.0006$	12	³¹ ALBRECHT 90J ARG $e^+e^- ightarrow \Upsilon(45)$	5)
$0.0019\!\pm\!0.0010\!\pm\!0.0006$	7	33 ALBRECHT 88K ARG $e^+e^- ightarrow \Upsilon(45)$	5)
absolute B($D^0 \rightarrow K^- \pi^+$ and B($D^0 \rightarrow K^- \pi^+ \pi^+$ ³¹ Assumes equal production fractions for the <i>D</i> . ³² BEBEK 87 value has been noted for BORTOLETTO ³³ ALBRECHT 88K assumes	product (+) and $(+\pi^{-})/(\pi^{-})$	the PDG 1992 B($D^0 \rightarrow K^- \pi^+ \pi^0$)/B($D^0 \rightarrow K^-$ /B($D^0 \rightarrow K^- \pi^+$). + and B^0 at the $\Upsilon(4S)$ and uses the Mark III brand dated in BERKELMAN 91 to use same assumptio $0:B^+B^-$ ratio is 45:55. Superseded by ALBRECHT	π^+) ching ns as '90J.
$\Gamma(\overline{D}{}^0 ho^+)/\Gamma_{ m total}$		Γ:	ι ₆ /Γ
$\frac{VALUE}{0.0134\pm0.0018}$ OUR AVERA	<u>EVIS</u>	DOCUMENTID TECN COMMENT	
$\begin{array}{l} 0.0135 \pm 0.0016 \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$	212 19 owing		5) 5)
$0.021 \ \pm 0.008 \ \pm 0.009$	10	36 ALBRECHT 88K ARG $e^+e^- ightarrow argamma(45)$	5)
³⁴ ALAM 94 assume equal absolute $B(D^0 \rightarrow K^- \pi^+)$ and $B(D^0 \rightarrow K^- \pi^+ \pi^+)$ ³⁵ Assumes equal production	produc ⁺) and ⁺ π [−])/	ction of B^+ and B^0 at the $\Upsilon(4S)$ and use the CL the PDG 1992 B($D^0 \rightarrow K^- \pi^+ \pi^0$)/B($D^0 \rightarrow K^-$ /B($D^0 \rightarrow K^- \pi^+$). + and B^0 at the $\Upsilon(4S)$ and uses the Mark III brane	EO II π^+)

fractions for the *D*. ³⁶ ALBRECHT 88K assumes $B^0 \overline{B}{}^0:B^+B^-$ ratio is 45:55.

$\Gamma(\overline{D}^0 K^+) / \Gamma_{\text{total}}$					Г ₁₇ /Г
VALUE (units 10^{-4})	DOC	UMENT ID	TECN	COMMEI	NT
2.92±0.80±0.28	37 ATH	IANAS 9	8 CLE2	e ⁺ e ⁻	$ ightarrow ~ \Upsilon(4S)$
³⁷ ATHANAS 98 reports [B(<i>B</i> ⁻ We multiply by our best val is their experiment's error a best value.	$^+ \rightarrow \overline{D}{}^0 \mu$ ue B(B^+ and our se	$(A^+)]/[B(B^+)] \rightarrow \overline{D}^0 \pi^+) =$ scond error is	$ ightarrow \overline{D}^0 \pi^-$ = (5.3 \pm 0 the system	$^+)] = 0.055$ $0.5) \times 10^{-1}$ ematic erre	$5\pm0.014\pm0.005$. ⁻³ . Our first error or from using our
$\Gamma(\overline{D}^0\pi^+\pi^+\pi^-)/\Gamma_{total}$	DOC	UMENT ID	TECN	COMMEI	Г ₁₈ /Г
0.0115±0.0029±0.0021	³⁸ BOF	RTOLETTO9	2 CLEO	e ⁺ e ⁻	$\rightarrow \Upsilon(4S)$
³⁸ BORTOLETTO 92 assume Mark III branching fractions	s equal pr for the D	oduction of	B^+ and b	B ⁰ at the	γ γ $(4S)$ and uses
$\Gamma(\overline{D}^0\pi^+\pi^+\pi^-$ nonresonar	it)/Γ _{total} DOC	UMENT ID	TECN	COMMEI	Γ ₁₉ /Γ
0.0051±0.0034±0.0023	³⁹ BOF	RTOLETTO9	2 CLEO	e ⁺ e ⁻	$ ightarrow ~ \Upsilon(4S)$
³⁹ BORTOLETTO 92 assume Mark III branching fractions	s equal pr for the D	oduction of	B^+ and b	B ⁰ at the	$\gamma(4S)$ and uses
$\Gamma(\overline{D}^0 \pi^+ \rho^0) / \Gamma_{\text{total}}$	DOC	UMENT ID	TECN	COMME	Г ₂₀ /Г
$0.0042 \pm 0.0023 \pm 0.0020$	40 BOE	RTOLETTO9	2 CLEO	<u>commen</u> e ⁺ e ⁻	$\rightarrow \gamma(4.5)$
⁴⁰ BORTOLETTO 92 assume Mark III branching fractions	s equal pr for the D	oduction of	B^+ and B^+	B ⁰ at the	r(4S) and uses
Γ $(\overline{D}^0 a_1(1260)^+)/\Gamma_{total}$	DOC	UMENT ID	TECN	COMMEI	Γ ₂₁ /Γ
0.0045±0.0019±0.0031	⁴¹ BOF	RTOLETTO	2 CLEO	e ⁺ e ⁻	$\rightarrow \gamma(4S)$
⁴¹ BORTOLETTO 92 assume Mark III branching fractions	s equal pr for the D	oduction of	B^+ and b	B ⁰ at the	$\gamma(4S)$ and uses
$\Gamma(D^*(2010)^-\pi^+\pi^+)/\Gamma_{tot}$	al <u>6 EVTS</u>	<u>DOCUME</u>	NT ID	<u>TECN</u>	Г ₂₂ /Г
0.0021±0.0006 OOR AVERA 0.0019±0.0007±0.0003	IGE 14	⁴² ALAM	9.	4 CLE2	$e^+e^- \rightarrow \gamma(45)$
$0.0026\!\pm\!0.0014\!\pm\!0.0007$	11	⁴³ ALBRE	CHT 9	ОЈ ARG	$e^+e^- \rightarrow \Upsilon(4S)$
$0.0024 \substack{+0.0017 + 0.0010 \\ -0.0016 - 0.0006}$	3	⁴⁴ BEBEK	8	7 CLEO	$e^+e^{ ightarrow $
• • • We do not use the follow	ing data f	or averages, f	its, limits	, etc. • •	•
<0.004 90		⁴⁵ BORTO	LETTO9	2 CLEO	$e^+e^- ightarrow$ $\Upsilon(4S)$
0.005 ±0.002 ±0.003	7	⁴⁶ ALBRE	CHT 8	7c ARG	$e^+e^- ightarrow \gamma(4S)$

 $\begin{array}{l} \mathsf{B}(D^*(2010)^+ \to D^0\pi^+) \text{ and absolute } \mathsf{B}(D^0 \to K^-\pi^+) \text{ and the PDG 1992 } \mathsf{B}(D^0 \to K^-\pi^+\pi^0)/\mathsf{B}(D^0 \to K^-\pi^+) \text{ and } \mathsf{B}(D^0 \to K^-\pi^+\pi^+\pi^-)/\mathsf{B}(D^0 \to K^-\pi^+). \end{array}$

- 43 Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$ and uses the Mark III branching fractions for the D.
- 44 BEBEK 87 value has been updated in BERKELMAN 91 to use same assumptions as noted for BORTOLETTO 92.
- 45 BORTOLETTO 92 assumes equal production of B^+ and B^0 at the $\varUpsilon(4S)$ and uses Mark III branching fractions for the D and $D^*(2010)$. The authors also find the product branching fraction into $D^{**}\pi$ followed by $D^{**} \rightarrow D^{*}(2010)\pi$ to be $0.0014 \substack{+0.0008 \\ -0.0006} \pm$

0.0003 where D^{**} represents all orbitally excited D mesons.

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

$\Gamma(D^-\pi^+\pi^+)/\Gamma_{total}$					Г ₂₃ /Г
VALUE	<u>CL% EVT</u>	<u>S</u> <u>DOCUMENT II</u>	7	TECN	<u>COMMENT</u>
<0.0014	90	⁴⁷ ALAM	94	CLE2	$e^+e^- ightarrow \Upsilon(4S)$
$\bullet \bullet \bullet$ We do not use the follo	wing data fo	or averages, fits, limit	s, etc.	• • •	
<0.007	90	⁴⁸ BORTOLET	ТО92	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
$0.0025 {+0.0041+0.0024 \\ -0.0023-0.0008}$	1	l ⁴⁹ BEBEK	87	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

⁴⁷ALAM 94 assume equal production of B^+ and B^0 at the $\Upsilon(4S)$ and use the Mark III $\mathsf{B}(D^+ \to K^- \pi^+ \pi^+).$

 48 BORTOLETTO 92 assumes equal production of B^+ and B^0 at the $\varUpsilon(4S)$ and uses Mark III branching fractions for the D. The product branching fraction into $D_0^*(2340)\pi$ followed by $D^*_0(2340) \rightarrow D\pi$ is < 0.005 at 90%CL and into $D^*_2(2460)$ followed by $D_2^*(2460) \rightarrow D\pi$ is < 0.004 at 90%CL.

 49 BEBEK 87 assume the $\Upsilon(4S)$ decays 43% to $B^0\overline{B}^0$. B($D^- o K^+\pi^-\pi^-) = (9.1\pm$ $1.3 \pm 0.4)\%$ is assumed.

- $\Gamma(\overline{D}^*(2007)^0\pi^+)/\Gamma_{\text{total}}$ VALUE DOCUMENT ID EVTS TECN COMMENT 0.0046 ±0.0004 OUR AVERAGE ⁵⁰ BRANDENB... 98 CLE2 $e^+e^- \rightarrow \Upsilon(4S)$ $0.00434 \pm 0.00047 \pm 0.00018$ ⁵¹ ALAM 94 CLE2 $e^+e^- \rightarrow \Upsilon(4S)$ $0.0052 \pm 0.0007 \pm 0.0007$ 71 ⁵² BORTOLETTO92 CLEO $e^+e^- \rightarrow \Upsilon(4S)$ $0.0072 \ \pm 0.0018 \ \pm 0.0016$ ⁵² ALBRECHT $0.0040\ \pm 0.0014\ \pm 0.0012$ 9 90J ARG $e^+e^ \Upsilon(4S)$ • • We do not use the following data for averages, fits, limits, etc. • • ⁵³ BFBFK 87 CLEO $e^+e^- \rightarrow \Upsilon(4S)$ 0.0027 ± 0.0044
- 50 BRANDENBURG 98 assume equal production of B^+ and B^0 at $\Upsilon(4S)$ and use the D^* reconstruction technique. The first error is their experiment's error and the second error is the systematic error from the PDG 96 value of $B(D^* \rightarrow D\pi)$.
- 51 ALAM 94 assume equal production of B^+ and B^0 at the $\varUpsilon(4S)$ and use the CLEO II $B(D^*(2007)^0 \rightarrow D^0 \pi^0)$ and absolute $B(D^0 \rightarrow K^- \pi^+)$ and the PDG 1992 $B(D^0 \rightarrow K^- \pi^+)$ $\tilde{K} = \pi^+ \pi^0)/B(D^0 \to \tilde{K} = \pi^+)$ and $B(D^0 \to K = \pi^+ \pi^+ \pi^-)/B(D^0 \to K = \pi^+).$
- 52 Assumes equal production of B^+ and B^0 at the $\varUpsilon(4S)$ and uses Mark III branching fractions for the D and $D^*(2010)$.
- ⁵³ This is a derived branching ratio, using the inclusive pion spectrum and other two-body B decays. BEBEK 87 assume the $\Upsilon(4S)$ decays 43% to $B^0 \overline{B}^0$.

HTTP://PDG.LBL.GOV

Created: 12/18/2000 15:06

 Γ_{24}/Γ

$\Gamma(D^*(2010)^+\pi^0)/\Gamma_{total}$						
VALUE	CL%	DOCUMENT ID	TECN	COMMENT		
<0.00017	90	⁵⁴ BRANDENB 98	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$	

⁵⁴BRANDENBURG 98 assume equal production of B^+ and B^0 at $\Upsilon(4S)$ and use the D^* partial reconstruction technique. The first error is their experiment's error and the second error is the systematic error from the PDG 96 value of $B(D^* \rightarrow D\pi)$.

$\Gamma(\overline{D}^*(2007)^0 \rho^+)/\Gamma_{\text{total}}$					Г ₂₆ /Г
VALUE	EVTS	DOCUMENT ID	TECN	COMMENT	
$0.0155 \pm 0.0031 \text{ OUR AVER}$	AGE				
$0.0168 \!\pm\! 0.0021 \!\pm\! 0.0028$	86	⁵⁵ ALAM	94 CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$0.010\ \pm 0.006\ \pm 0.004$	7	⁵⁶ ALBRECHT	90J ARG	$e^+e^- ightarrow$	$\Upsilon(4S)$

⁵⁵ ALAM 94 assume equal production of B^+ and B^0 at the $\Upsilon(4S)$ and use the CLEO II B($D^*(2007)^0 \rightarrow D^0 \pi^0$) and absolute B($D^0 \rightarrow K^- \pi^+$) and the PDG 1992 B($D^0 \rightarrow K^- \pi^+ \pi^0$)/B($D^0 \rightarrow K^- \pi^+$) and B($D^0 \rightarrow K^- \pi^+ \pi^+ \pi^-$)/B($D^0 \rightarrow K^- \pi^+$). The nonresonant $\pi^+ \pi^0$ contribution under the ρ^+ is negligible.

⁵⁶ Assumes equal production of B^+ and B^0 at the $\tilde{\Upsilon}(4S)$ and uses Mark III branching fractions for the D and $D^*(2010)$.

$\Gamma(\overline{D}^*(2007)^0\pi^+\pi^+\pi^-$)/Γ _{total}					Г ₂₇ /Г
VALUE	<u>EVTS</u>	DOCUMENT ID		TECN	<u>COMMENT</u>	
0.0094±0.0020±0.0017	48 57	^{,58} ALAM	94	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
F7						

⁵⁷ ALAM 94 assume equal production of B^+ and B^0 at the $\Upsilon(4S)$ and use the CLEO II B $(D^*(2007)^0 \rightarrow D^0 \pi^0)$ and absolute B $(D^0 \rightarrow K^- \pi^+)$ and the PDG 1992 B $(D^0 \rightarrow K^- \pi^+ \pi^0)/B(D^0 \rightarrow K^- \pi^+)$ and B $(D^0 \rightarrow K^- \pi^+ \pi^+ \pi^-)/B(D^0 \rightarrow K^- \pi^+)$.

⁵⁸ The three pion mass is required to be between 1.0 and 1.6 GeV consistent with an a_1 meson. (If this channel is dominated by a_1^+ , the branching ratio for $\overline{D}^{*0}a_1^+$ is twice that for $\overline{D}^{*0}\pi^+\pi^+\pi^-$.)

$\Gamma(\overline{D}^{*}(2007)^{0}a_{1}(1260)^{+})/\Gamma_{total}$

VALUE	DOCUMENT ID		TECN	COMMENT	
$0.0188 \pm 0.0040 \pm 0.0034$	59,60 ALAM	94	CLE2	$e^+e^- ightarrow ~\Upsilon(4S)$	

⁵⁹ ALAM 94 value is twice their $\Gamma(\overline{D}^*(2007)^0 \pi^+ \pi^+ \pi^-)/\Gamma_{\text{total}}$ value based on their observation that the three pions are dominantly in the $a_1(1260)$ mass range 1.0 to 1.6 co GeV.

⁶⁰ ALAM 94 assume equal production of B^+ and B^0 at the $\Upsilon(4S)$ and use the CLEO II B($D^*(2007)^0 \rightarrow D^0 \pi^0$) and absolute B($D^0 \rightarrow K^- \pi^+$) and the PDG 1992 B($D^0 \rightarrow K^- \pi^+ \pi^0$)/B($D^0 \rightarrow K^- \pi^+$) and B($D^0 \rightarrow K^- \pi^+ \pi^+ \pi^-$)/B($D^0 \rightarrow K^- \pi^+$).

$\Gamma(D^*(2010)^-\pi^+\pi^+\pi^0)$	')/Γ _{total}				Г ₂₉ /Г
VALUE	EVTS	DOCUMENT ID	TECN	COMMENT	
$0.0152 \pm 0.0071 \pm 0.0001$	26	⁶¹ ALBRECHT	90J ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\bullet \bullet \bullet$ We do not use the fo	ollowing d	lata for averages, fi	ts, limits, etc	C. • • •	
$0.043 \ \pm 0.013 \ \pm 0.026$	24	⁶² ALBRECHT	87c ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
⁶¹ ALBRECHT 90J reports 0.06. We rescale to our Our first error is their	s 0.018 \pm r best val experime	0.007 ± 0.005 for E ue B $(D^*(2010)^+-$ nt's error and our s	$B(D^*(2010)^-)$ $\rightarrow D^0\pi^+) =$ second error	$^+ \rightarrow D^0 \pi^+$ = (67.7 ± 0.1 is the syste	$)=0.57\pm$ 5 $) imes10^{-2}.$ matic error

HTTP://PDG.LBL.GOV

 Γ_{28}/Γ

from using our best value. Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$ and uses Mark III branching fractions for the D.

⁶²ALBRECHT 87C use PDG 86 branching ratios for D and $D^*(2010)$ and assume $B(\Upsilon(4S) \rightarrow B^+B^-) = 55\%$ and $B(\Upsilon(4S) \rightarrow B^0\overline{B}^0) = 45\%$. Superseded by AL-BRECHT 90J.

$\Gamma(D^*(2010)^-\pi^+\pi^+\pi^+\pi^-)/\Gamma_{total}$						Г ₃₀ /Г
VALUE	<u>CL%</u>	DOCUMENT ID		TECN	<u>COMMENT</u>	
<0.01	90	⁶³ ALBRECHT	90J	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$

⁶³Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$ and uses Mark III branching fractions for the D and $D^*(2010)$.

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

 Γ_{31}/Γ

					U ±/
VALUE	EVTS	DOCUMENT ID	TECN	COMMENT	
0.0015 ± 0.0006 OUR AVER	AGE	Error includes scale fac	ctor of 1.3.		
$0.0011 \!\pm\! 0.0005 \!\pm\! 0.0002$	8	⁶⁴ ALAM	94 CLE2	$e^+e^- \rightarrow -$	$\Upsilon(4S)$
$0.0025\!\pm\!0.0007\!\pm\!0.0006$		⁶⁵ ALBRECHT	94d ARG	$e^+e^- \rightarrow e^-$	$\Upsilon(4S)$

⁶⁴ ALAM 94 assume equal production of B^+ and B^0 at the $\Upsilon(4S)$ and use the CLEO II $B(D^*(2010)^+ \rightarrow D^0 \pi^+)$ and absolute $B(D^0 \rightarrow K^- \pi^+)$ and the PDG 1992 $B(D^0 \rightarrow K^- \pi^+ \pi^0)/B(D^0 \rightarrow K^- \pi^+)$ and assuming $B(D_1(2420)^0 \rightarrow D^*(2010)^+ \pi^-) = 67\%$. ⁶⁵ ALBRECHT 94D assume equal production of B^+ and B^0 at the $\Upsilon(4S)$ and use the CLEO II $B(D^*(2010)^+ \rightarrow D^0 \pi^+)$ assuming $B(D_1(2420)^0 \rightarrow D^*(2010)^+ \pi^-) = 67\%$.

Г(D_{1}^{*}	(2420)) ⁰)/Γ _{total}
----	-------------	--------	----------------	----------------------

 Γ_{32}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT	
<0.0014	90	66 ALAM	94	CLE2	$e^+e^- ightarrow ~\Upsilon(4S)$	

⁶⁶ ALAM 94 assume equal production of B^+ and B^0 at the $\Upsilon(4S)$ and use the CLEO II $B(D^*(2010)^+ \rightarrow D^0 \pi^+)$ assuming $B(D_1(2420)^0 \rightarrow D^*(2010)^+ \pi^-) = 67\%$.

$\Gamma(\overline{D}_2^*)$	(2460) ⁰	⁾ π ⁺)	$/\Gamma_{total}$
----------------------------	---------------------	-------------------------------	-------------------

 Γ_{33}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT	
<0.0013	90	⁶⁷ ALAM	94 CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\bullet~\bullet~\bullet$ We do not use the	following	g data for averages,	fits, limits,	etc. • • •	
<0.0028	90	⁶⁸ ALAM	94 CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
<0.0023	90	⁶⁹ ALBRECHT	94d ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
67			0		

⁶⁷ ALAM 94 assume equal production of B^+ and B^0 at the $\Upsilon(4S)$ and use the Mark III $B(D^+ \rightarrow K^- \pi^+ \pi^+)$ and $B(D_2^*(2460)^0 \rightarrow D^+ \pi^-) = 30\%$.

⁶⁸ ALAM 94 assume equal production of B^+ and B^0 at the $\Upsilon(4S)$ and use the Mark III $B(D^+ \rightarrow K^- \pi^+ \pi^+)$, the CLEO II $B(D^*(2010)^+ \rightarrow D^0 \pi^+)$ and $B(D_2^*(2460)^0 \rightarrow D^*(2010)^+ \pi^-) = 20\%$.

⁶⁹ ALBRECHT 94D assume equal production of B^+ and B^0 at the $\Upsilon(4S)$ and use the CLEO II B($D^*(2010)^+ \rightarrow D^0 \pi^+$) and B($D^*_2(2460)^0 \rightarrow D^*(2010)^+ \pi^-$) = 30%.

$\Gamma(\overline{D}_2^*(2460)^0\rho^+)/I$	total					Г ₃₄ /Г
VALUE	<u>CL%</u>	DOCUMENT ID	1	TECN	COMMENT	
<0.0047	90 00	70 ALAM 71 ALAM	94 04	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
<0.003 70 at and od	90		94 1 D		$e \cdot e \rightarrow$	7 (43)
$R(D^+ \rightarrow K^- \pi^+)$	equal pro- π^+) and	B($D^*(2460)^0 \rightarrow$	а В° D+ т	at the ·) - 3	1 (45) and u 0%	ise the Mark III
71 ALAM 94 assume		duction of B^+ and	4 R ⁰) — 5 at the 1	$\Upsilon(4S)$ and μ	ise the Mark III
$B(D^+ \rightarrow K^- \pi^+)$	π^+), the	CLEO II B(D^* (20	10) ⁺	$\rightarrow D^{C}$	π^+) and B	$(D_2^*(2460)^0 \rightarrow$
$D^{*}(2010)^{+}\pi^{-}) =$	= 20%.		,		,	× 2× /
$\Gamma(\overline{D}^0 D^+) / \Gamma_{\text{total}}$						[25/[
VALUE	EVTS	DOCUMENT ID		TECN	COMMENT	- 357 -
0.013 ±0.004 OUR	AVERAGE					
$0.0122 \pm 0.0032 + 0.002$	29 30	⁷² GIBAUT	96	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$0.018 \pm 0.009 \pm 0.004$	4	⁷³ ALBRECHT	9 2G	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$0.016\ \pm 0.007\ \pm 0.004$	45	⁷⁴ BORTOLETT	O90	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
⁷² GIBAUT 96 reports	s 0.0126 \pm	\pm 0.0022 \pm 0.0025 f	or B($D_{s}^{+} \rightarrow$	$\phi \pi^+$) = 0.0	35. We rescale
to our best value experiment's error a ⁷³ ALBRECHT 92G r	B(D ⁺ _s – and our se reports 0.0	$\phi \pi^+$ (3.6 = $\phi \pi^+$) = $(3.6 = 0.000)$ econd error is the synaptical synaptical density (3.6) $\phi \pi^+$ (3.6) ϕ	± 0.9) /stem)04 fc) \times 10 ⁻ atic erro or B(D^+	e^2 . Our first or from using $e^- \rightarrow \phi \pi^+$	t error is their our best value. = 0.027. We
rescale to our best experiment's error Assumes PDG 199 ⁷⁴ BORTOLETTO 90	value B(<i>L</i> and our se 0 <i>D</i> ⁰ brar) reports 0	$D_s^+ \rightarrow \phi \pi^+) = (3)$ econd error is the synching ratios, e.g., 0.029 ± 0.013 for B($3.6 \pm$ /stem B(D^0 $(D_s^+ -$	$\begin{array}{c} 0.9) \times 1 \\ \text{atic error} \\ \rightarrow & K^{-} \\ \rightarrow & \phi \pi^{+} \end{array}$	0^{-2} . Our find from using $(-\pi^+) = 3.7$ $(-\pi^+) = 0.02$. W	rst error is their our best value. $1\pm 0.25\%$. re rescale to our
best value B(D_s^+ - error and our secor	$ ightarrow \phi \pi^+)$ nd error is	= (3.6 \pm 0.9) $ imes$ 1 the systematic err	0 ⁻² . or fro	Our firs m using	t error is the our best va	eir experiment's lue.
$\Gamma(\overline{D}^0 D_s^{*+})/\Gamma_{\text{total}}$		DOCUMENT ID	1	<u>TECN</u>	<u>COMMENT</u>	Г ₃₆ /Г
0.009 ± 0.004 OUR	AVERAGE					
$0.0084 \pm 0.0031 {+0.002} {-0.002}$	20 21	⁷⁵ GIBAUT	96	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$0.012 \ \pm 0.009 \ \pm 0.003$	3	⁷⁶ ALBRECHT	920	G ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
⁷⁵ GIBAUT 96 reports	s 0.0087 ±	\pm 0.0027 \pm 0.0017 f	or B($D_{s}^{+} \rightarrow$	$\phi \pi^+$) = 0.0	35. We rescale
to our best value	$B(D_s^+ -$	$\phi \pi^+$) = (3.6 =	± 0.9)) \times 10 ⁻	^{.2} . Our firs	t error is their

to our best value $B(D_s^+ \rightarrow \phi \pi^+) = (3.6 \pm 0.9) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. ⁷⁶ ALBRECHT 92G reports $0.016 \pm 0.012 \pm 0.003$ for $B(D_s^+ \rightarrow \phi \pi^+) = 0.027$. We rescale to our best value $B(D_s^+ \rightarrow \phi \pi^+) = (3.6 \pm 0.9) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes PDG 1990 D^0 branching ratios, e.g., $B(D^0 \rightarrow K^- \pi^+) = 3.71 \pm 0.25\%$.

$\Gamma(\overline{D}^*(2007)^0 D_s^+) / \Gamma_{\text{total}}$				Г ₃₇ /I
VALUE	DOCUMENT ID	TECN	COMMENT	
0.012 ± 0.005 OUR AVERAGE				
$0.014\!\pm\!0.005\!\pm\!0.003$	⁷⁷ GIBAUT	96 CLE2	$e^+e^- ightarrow$	$\Upsilon(4S)$
$0.010 \pm 0.007 \pm 0.002$	⁷⁸ ALBRECHT	92g ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$

⁷⁷ GIBAUT 96 reports $0.0140 \pm 0.0043 \pm 0.0035$ for $B(D_s^+ \rightarrow \phi \pi^+) = 0.035$. We rescale to our best value $B(D_s^+ \rightarrow \phi \pi^+) = (3.6 \pm 0.9) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. ⁷⁸ ALBRECHT 92G reports $0.013 \pm 0.009 \pm 0.002$ for $B(D_s^+ \rightarrow \phi \pi^+) = 0.027$. We rescale to our best value $B(D_s^+ \rightarrow \phi \pi^+) = (3.6 \pm 0.9) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes PDG 1990 D^0 and $D^*(2007)^0$ branching ratios, e.g., $B(D^0 \rightarrow K^- \pi^+) =$ $3.71 \pm 0.25\%$ and $B(D^*(2007)^0 \rightarrow D^0 \pi^0) = 55 \pm 6\%$.

$\Gamma(\overline{D}^*(2007)^0 D_s^{*+})/\Gamma_{\text{total}}$					Г ₃₈ /	Γ
VALUE	DOCUMENT ID		TECN	COMMENT		
0.027 ± 0.010 OUR AVERAGE						
$0.030\!\pm\!0.011\!\pm\!0.007$	⁷⁹ GIBAUT	96	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$	
$0.023\!\pm\!0.013\!\pm\!0.006$	⁸⁰ ALBRECHT	9 2G	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$	
70				1		

⁷⁹ GIBAUT 96 reports $0.0310 \pm 0.0088 \pm 0.0065$ for $B(D_s^+ \rightarrow \phi \pi^+) = 0.035$. We rescale to our best value $B(D_s^+ \rightarrow \phi \pi^+) = (3.6 \pm 0.9) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. ⁸⁰ ALBRECHT 92G reports $0.031 \pm 0.016 \pm 0.005$ for $B(D_s^+ \rightarrow \phi \pi^+) = 0.027$. We rescale to our best value $B(D_s^+ \rightarrow \phi \pi^+) = (3.6 \pm 0.9) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes PDG 1990 D^0 and $D^*(2007)^0$ branching ratios, e.g., $B(D^0 \rightarrow K^-\pi^+) =$ $3.71 \pm 0.25\%$ and $B(D^*(2007)^0 \rightarrow D^0\pi^0) = 55 \pm 6\%$.

$\Gamma(\overline{D}^{*}(2007)^{0}D^{*}(2010)^{+})/\Gamma_{\text{total}}$							
VALUE	<u>CL%</u>	DOCUMENT ID	TECN	COMMENT			
<0.011	90	BARATE	98Q ALEP	$e^+e^- \rightarrow Z$			
$\left[\Gamma(\overline{D}^{0}D^{*}(2010)^{+}) + \Gamma(\overline{D}^{*}(2007)^{0}D^{+}) \right] / \Gamma_{\text{total}}$							
VALUE	<u>CL%</u>	DOCUMENT ID	TECN	COMMENT			
<0.013	90	BARATE	98Q ALEP	$e^+e^- \rightarrow Z$			
$\Gamma(\overline{D}{}^0D^+)/\Gamma_{\text{total}}$					Г ₄₁ /Г		
VALUE	<u>CL%</u>	DOCUMENT ID	TECN	<u>COMMENT</u>			
<0.0067	90	BARATE	98Q ALEP	$e^+e^- \rightarrow Z$			
$\Gamma(D_s^+\pi^0)/\Gamma_{total}$					Г ₄₂ /Г		
VALUE	<u>CL%</u>	DOCUMENT ID	TECN	COMMENT			
<0.00020	90	⁸¹ ALEXANDER	93B CLE2	$e^+e^- \rightarrow \gamma$	(4S)		
⁸¹ ALEXANDER 93B	reports <	$12.0 imes 10^{-4}$ for B(l	$D_s^+ \rightarrow \phi \pi^-$	$^{+}) = 0.037. ~{ m W}$	e rescale to		
our best value $B(D)$	$\frac{+}{s} \rightarrow \phi \tau$	$(\tau^+) = 0.036.$					

$\left[\Gamma \left(D_s^+ \pi^0 \right) + \Gamma \left(D_s^{*+} \right) \right]$	[π ⁰)]/Γ	total	TECH	([Γ ₄₂ +Γ ₄₃)/Γ
<u>VALUE</u>	<u>00</u>	82 ALBRECHT 035	$\frac{TECN}{2}$	$\frac{COMMENT}{a^+a^-} \rightarrow$	$\Upsilon(\Lambda S)$
82 AL PRECUT 025 rom	$\frac{30}{2}$	0×10^{-3} for $P(D^+)$	- ANG		
hest value $B(D^+ \rightarrow$	$d\pi^+$	-0.036	$\varphi \pi + j$	= 0.027. VV	e rescale to our
best value $D(D_s)$	φπ)	- 0.030.			
$\Gamma(D_s^{*+}\pi^{0})/\Gamma_{\text{total}}$					Г ₄₃ /Г
VALUE	<u>CL%</u>	DOCUMENT ID	TECN	COMMENT	
<0.00033	90	⁸³ ALEXANDER 93	3 CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
⁸³ ALEXANDER 93B re	eports $<$	$3.2 imes 10^{-4}$ for B(D_s^+	$\rightarrow \phi \pi^{-}$	+) = 0.037.	We rescale to
our best value B(D_s^+	$\rightarrow \phi \pi$	+) = 0.036.			
$\Gamma(D_s^+\eta)/\Gamma_{total}$					Г ₄₄ /Г
VALUE	<u>CL%</u>	DOCUMENT ID	TECN	<u>COMMENT</u>	-
<0.0005	90	⁸⁴ ALEXANDER 93	B CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
⁸⁴ ALEXANDER 93B re	eports <	$4.6 imes 10^{-4}$ for B(D_s^+)	$\rightarrow \phi \pi^{-}$	+) = 0.037.	We rescale to
our best value B(D_s^+	$ \rightarrow \phi \pi$	(+) = 0.036.			
$\Gamma(D_s^{*+}\eta)/\Gamma_{\text{total}}$					Γ45/Γ
VALUE	<u>CL%</u>	DOCUMENT ID	TECN	COMMENT	107
<0.0008	90	⁸⁵ ALEXANDER 93	B CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
⁸⁵ ALEXANDER 93B re	eports <	$7.5 imes 10^{-4}$ for B(D_s^+)	$\rightarrow \phi \pi^{-}$	+) = 0.037.	We rescale to
our best value B(D_s^+	$ \rightarrow \phi \pi$	(+) = 0.036.			
$\Gamma(D_{\star}^{+}\rho^{0})/\Gamma_{\text{total}}$					Γ46/Γ
VALUE	<u>CL%</u>	DOCUMENT ID	TECN	<u>COMMENT</u>	,
<0.0004	90	⁸⁶ ALEXANDER 93	B CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
⁸⁶ ALEXANDER 93B re	eports $<$	$3.7 imes 10^{-4}$ for B(D $_{f s}^+$	$\rightarrow \phi \pi^{-}$	+) = 0.037.	We rescale to
our best value B(D_{s}^{+}	$ \rightarrow \phi \pi$	(+) = 0.036.			
$\left[\Gamma(D_{s}^{+}\rho^{0})+\Gamma(D_{s}^{+}\overline{\rho}^{0})\right]$	K *(892)) ⁰)]/Γ _{total}		([Γ ₄₆ +Γ ₅₆)/Γ
VALUE	<u>CL%</u>	DOCUMENT ID	TECN	<u>COMMENT</u>	
<0.0025	90	⁸⁷ ALBRECHT 93	e arg	$e^+e^- \rightarrow$	$\Upsilon(4S)$
⁸⁷ ALBRECHT 93E rep	orts < 3 .	4×10^{-3} for B($D_s^+ \rightarrow$	$\phi \pi^+$):	= 0.027. We	e rescale to ou
best value B($D^+_{m{s}} ightarrow$	$\phi \pi^+$)	= 0.036.			
$\Gamma(D_s^{*+} ho^{0})/\Gamma_{total}$					Г ₄₇ /Г
VALUE	<u>CL%</u>	DOCUMENT ID	TECN	<u>COMMENT</u>	
<0.0005	90	⁸⁸ ALEXANDER 93	3 CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
⁸⁸ ALEXANDER 93B re	eports $<$	$4.8 imes 10^{-4}$ for B(D_s^+	$\rightarrow \phi \pi^{-}$	+) = 0.037.	We rescale to
our best value $B(D_s^+)$	$\rightarrow \phi \pi$.+) = 0.036.			

$\left[\Gamma(D_{s}^{*+}\rho^{0})+\Gamma(D_{s}^{*+}\right]$	<i>¯K</i> *(89	2) ⁰)]/Γ _{total}		(Г ₄₇ +Г ₅₇)/Г
VALUE	<u>CL%</u>	DOCUMENT ID	TECN	<u>COMMENT</u>	
<0.0015	90	⁸⁹ ALBRECHT	3e ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
⁸⁹ ALBRECHT 93E repo	orts < 2.0	0×10^{-3} for B(D_c^+ -	$\rightarrow \phi \pi^+$) =	= 0.027. We	e rescale to our
best value B($D^+_{m{s}} ightarrow$	$\phi\pi^+$) =	= 0.036.			
$\Gamma(D_s^+\omega)/\Gamma_{ ext{total}}$					Г ₄₈ /Г
VALUE	<u>CL%</u>	DOCUMENT ID	TECN	COMMENT	
<0.0005	90	⁹⁰ ALEXANDER 9	3B CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
• • • We do not use the	e followin	g data for averages,	tits, limits,	etc. ● ● ●	
<0.0025	90	⁹¹ ALBRECHT	3E ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
⁹⁰ ALEXANDER 93B re	eports <	$4.8 imes 10^{-4}$ for B(D)	$s^+ \rightarrow \phi \pi^+$) = 0.037.	We rescale to
our best value $B(D_s^+)$	$\rightarrow \phi \pi^{-}$	⁺) = 0.036.			
⁹¹ ALBRECHT 93E repo	orts < 3.4	$4 imes 10^{-3}$ for B(D_s^+ -	$\rightarrow \phi \pi^+$) =	= 0.027. We	e rescale to our
best value $B(D^+_{m{s}} o$	$\phi\pi^+$) =	= 0.036.			
$\Gamma(D_s^{*+}\omega)/\Gamma_{ ext{total}}$					Г ₄₉ /Г
VALUE	<u>CL%</u>	DOCUMENT ID	TECN	<u>COMMENT</u>	
<0.0007	90	⁹² ALEXANDER	3B CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
• • • We do not use the	e followin	g data for averages,	fits, limits,	etc. ● ● ●	
<0.0014	90	⁹³ ALBRECHT	3e ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
⁹² ALEXANDER 93B re	eports <	$6.8 imes 10^{-4}$ for B(D)	$s^+ \rightarrow \phi \pi^+$) = 0.037.	We rescale to
our best value B(D_s^+	$\rightarrow \phi \pi^{-}$	+) = 0.036.			
93 ALBRECHT 93E repo	orts < 1.9	$9 imes 10^{-3}$ for B(D_s^+ -	$\rightarrow \phi \pi^+$) =	= 0.027. We	e rescale to our
best value B($D^+_{m{s}} ightarrow$	$\phi\pi^+$) =	= 0.036.			
$\Gamma(D_s^+a_1(1260)^0)/\Gamma_{tc}$	otal				Г ₅₀ /Г
VALUE	<u>CL%</u>	DOCUMENT ID	TECN	COMMENT	<u> </u>
<0.0022	90	⁹⁴ ALBRECHT	3e ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
94 ALBRECHT 93E repo	orts < 3.0	$0 imes 10^{-3}$ for B(D_s^+ -	$\rightarrow \phi \pi^+$) =	= 0.027. We	e rescale to our
best value B($D^+_{m{s}} ightarrow$	$\phi\pi^+$) =	= 0.036.			
$\Gamma(D_s^{*+}a_1(1260)^0)/\Gamma$	total				Г ₅₁ /Г
VALUE	<u>CL%</u>	DOCUMENT ID	TECN	<u>COMMENT</u>	
<0.0016	90	⁹⁵ ALBRECHT	3e ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$

⁹⁵ ALBRECHT 93E reports $< 2.2 \times 10^{-3}$ for B($D_s^+ \rightarrow \phi \pi^+$) = 0.027. We rescale to our best value B($D_s^+ \rightarrow \phi \pi^+$) = 0.036.

$\Gamma(D_{\epsilon}^{+}\phi)/\Gamma_{\text{total}}$					Г ₅₂ /Г
VALUE	<u>CL%</u>	DOCUMENT ID	TECN	COMMENT	
<0.00032	90	⁹⁶ ALEXANDER	93B CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
• • • We do not use the	followin	ng data for averages	, fits, limits,	etc. • • •	
<0.0013	90	⁹⁷ ALBRECHT	93e ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
⁹⁶ ALEXANDER 93B re	ports $<$	$3.1 imes 10^{-4}$ for B(L	$D_{s}^{+} \rightarrow \phi \pi^{+}$) = 0.037.	We rescale to
our best value B(D_s^+	$\rightarrow \phi \pi$	⁺) = 0.036.			
⁹⁷ ALBRECHT 93E repo	orts < 1 .	$7 imes 10^{-3}$ for B(D_s^+	$\rightarrow \phi \pi^+$) =	= 0.027. We	rescale to our
best value B($D^+_{m{s}} ightarrow$	$\phi\pi^+$) =	= 0.036.			
$\Gamma(D_{*}^{*+}\phi)/\Gamma_{\text{total}}$					Γ53/Γ
VALUE	CL%	DOCUMENT ID	TECN	COMMENT	- 33/ -
<0.0004	90	98 ALEXANDER	93B CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\bullet \bullet \bullet$ We do not use the	followin	ng data for averages	, fits, limits,	etc. • • •	
<0.0016	90	⁹⁹ ALBRECHT	93e ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
⁹⁸ ALEXANDER 93B re	ports $<$	4.2×10^{-4} for B(1	$D_{s}^{+} \rightarrow \phi \pi^{+}$) = 0.037.	We rescale to
our best value $B(D_c^+)$	$\rightarrow \phi \pi$	⁺) = 0.036.	5		
⁹⁹ ALBRECHT 93E repo	orts < 2 .	1×10^{-3} for B(D ⁺	$\rightarrow \phi \pi^+$) =	= 0.027. We	e rescale to our
best value $B(D_{c}^{+} \rightarrow$	$\phi\pi^+$):	= 0.036.			
5					
$\Gamma(D^+\overline{K}^0)/\Gamma_{\rm trank}$					
$\Gamma(D_s^+\overline{K}^0)/\Gamma_{\text{total}}$	CL%	DOCUMENT ID	TECN	COMMENT	Г ₅₄ /Г
$\frac{\Gamma(D_s^+ \overline{K}^0) / \Gamma_{\text{total}}}{\frac{VALUE}{< 0.0011}}$	<u>CL%</u> 90	DOCUMENT ID 100 ALEXANDER	<u>7ECN</u> 93B CLE2	$\frac{COMMENT}{e^+e^-} \rightarrow$	Γ₅₄/Γ <i>Υ</i> (4 <i>S</i>)
$\frac{\Gamma(D_s^+ \overline{K}^0) / \Gamma_{\text{total}}}{\frac{VALUE}{< 0.0011}}$	<u>CL%</u> 90 followin	<u>DOCUMENT ID</u> 100 ALEXANDER ng data for averages	<u>TECN</u> 93B CLE2 , fits, limits,	$\frac{COMMENT}{e^+e^-} \rightarrow$ etc. • • •	Γ₅₄/Γ <i>Υ</i> (4 <i>S</i>)
$\frac{\Gamma(D_s^+ \overline{K}^0) / \Gamma_{\text{total}}}{< 0.0011}$ ••• We do not use the <0.0019	<u>CL%</u> 90 followin 90	DOCUMENT ID 100 ALEXANDER 101 ALBRECHT	93B CLE2 , fits, limits, 93E ARG	$\frac{COMMENT}{e^+e^-} \rightarrow$ etc. • • • $e^+e^- \rightarrow$	Γ₅₄/Γ <i>Υ</i> (4 <i>S</i>) <i>Υ</i> (4 <i>S</i>)
$\frac{\Gamma(D_s^+ \overline{K}^0) / \Gamma_{\text{total}}}{< 0.0011}$ ••• We do not use the <0.0019 100 ALEXANDER 93B re	<u>CL%</u> 90 followin 90 ports <	$\frac{DOCUMENT \ ID}{100}$ ALEXANDER og data for averages 101 ALBRECHT 10.3×10^{-4} for B($\frac{\text{TECN}}{\text{93B CLE2}}$, fits, limits, 93E ARG $D_s^+ \rightarrow \phi \pi^-$	$\frac{COMMENT}{e^+e^-} \rightarrow$ etc. • • • $e^+e^- \rightarrow$ +) = 0.037.	Γ_{54}/Γ $\Upsilon(4S)$ $\Upsilon(4S)$ We rescale to
$\frac{\Gamma(D_s^+ \overline{K}^0)}{\Gamma_{\text{total}}}$ <u>VALUE</u> 0.0011 ••• We do not use the <0.0019 100 ALEXANDER 93B re our best value B(D_s^+)	$\frac{CL\%}{90}$ followin 90 ports < $\rightarrow \phi \pi$	$\frac{DOCUMENT \ ID}{ALEXANDER}$ og data for averages $\frac{101}{ALBRECHT}$ $10.3 \times 10^{-4} \text{ for B(}$ $^+) = 0.036.$	$\frac{TECN}{93B} \text{ CLE2}$, fits, limits, 93E ARG $D_s^+ \rightarrow \phi \pi^-$	$\frac{COMMENT}{e^+e^- \rightarrow}$ etc. • • • $e^+e^- \rightarrow$ +) = 0.037.	Γ_{54}/Γ $\Upsilon(4S)$ $\Upsilon(4S)$ We rescale to
$\frac{\Gamma(D_s^+ \overline{K}^0)}{\Gamma_{\text{total}}}$ $\frac{VALUE}{< 0.0011}$ ••• We do not use the < 0.0019 100 ALEXANDER 93B re our best value B(D_s^+ 101 ALBRECHT 93E report	$\frac{CL\%}{90}$ followin 90 ports $< \rightarrow \phi \pi$ orts < 2 .	$\frac{DOCUMENT \ ID}{100 \ ALEXANDER}$ ng data for averages 101 ALBRECHT 10.3 × 10 ⁻⁴ for B(+) = 0.036. 5 × 10 ⁻³ for B(D_c^+)	$\frac{\text{TECN}}{\text{93B CLE2}}$, fits, limits, 93E ARG $D_s^+ \rightarrow \phi \pi^-$	$\frac{COMMENT}{e^+e^-} \rightarrow$ etc. • • • $e^+e^- \rightarrow$ +) = 0.037.	Γ_{54}/Γ $\Upsilon(4S)$ $\Upsilon(4S)$ We rescale to e rescale to our
$\frac{\Gamma(D_s^+ \overline{K}^0)}{\Gamma_{\text{total}}}$ $\frac{VALUE}{<0.0011}$ ••• We do not use the <0.0019 100 ALEXANDER 93B re our best value B(D_s^+ 101 ALBRECHT 93E report best value B($D_s^+ \rightarrow$	$\frac{CL\%}{90}$ followin 90 ports < $\rightarrow \phi \pi$ ports < 2. $\phi \pi^+$)	$\frac{DOCUMENT \ ID}{ALEXANDER}$ $100 \ ALEXANDER$ $101 \ ALBRECHT$ $10.3 \times 10^{-4} \ for \ B($ $^{+}) = 0.036.$ $5 \times 10^{-3} \ for \ B(D_{s}^{+})$ $= 0.036.$	$\frac{TECN}{93B \text{ CLE2}}$, fits, limits, 93E ARG $D_s^+ \rightarrow \phi \pi^-$	$\frac{COMMENT}{e^+e^- \rightarrow}$ etc. • • • $e^+e^- \rightarrow$ +) = 0.037.	Γ_{54}/Γ $\Upsilon(4S)$ $\Upsilon(4S)$ We rescale to e rescale to our
$\Gamma(D_{s}^{+}\overline{K}^{0})/\Gamma_{\text{total}}$ <u>VALUE</u> <0.0011 ••• We do not use the <0.0019 100 ALEXANDER 93B re our best value B(D_{s}^{+} 101 ALBRECHT 93E report best value B($D_{s}^{+} \rightarrow$ $\Gamma(D^{*+}\overline{K}^{0})/\Gamma_{s} \rightarrow$	$\frac{CL\%}{90}$ followin 90 ports < $\rightarrow \phi \pi$ orts < 2. $\phi \pi^+$)	$\frac{DOCUMENT \ ID}{ALEXANDER}$ $100 \ ALEXANDER$ $101 \ ALBRECHT$ $10.3 \times 10^{-4} \ for \ B($ $^+) = 0.036.$ $5 \times 10^{-3} \ for \ B(D_s^+)$ $= 0.036.$	$\frac{TECN}{93B \text{ CLE2}}$, fits, limits, 93E ARG $D_s^+ \rightarrow \phi \pi^-$	$\frac{COMMENT}{e^+e^- \rightarrow}$ etc. • • • $e^+e^- \rightarrow$ +) = 0.037.	Γ_{54}/Γ $\Upsilon(4S)$ $\Upsilon(4S)$ We rescale to our rescale to our
$\frac{\Gamma(D_s^+ \overline{K}^0) / \Gamma_{\text{total}}}{\langle 0.0011}$ ••• We do not use the <0.0019 ¹⁰⁰ ALEXANDER 93B re our best value B(D_s^+ ¹⁰¹ ALBRECHT 93E repor- best value B($D_s^+ \rightarrow$ $\Gamma(D_s^{*+} \overline{K}^0) / \Gamma_{\text{total}}$	$\frac{CL\%}{90}$ followin 90 ports < $\rightarrow \phi \pi$ ports < 2. $\phi \pi^+$)	<u>DOCUMENT ID</u> 100 ALEXANDER ng data for averages 101 ALBRECHT 10.3 × 10 ⁻⁴ for B(+) = 0.036. 5 × 10 ⁻³ for B(D_s^+ = 0.036.	$\frac{TECN}{93B} CLE2$, fits, limits, 93E ARG $D_s^+ \rightarrow \phi \pi^-$ $T \rightarrow \phi \pi^+$) =	$\frac{COMMENT}{e^+e^-} \rightarrow etc. \bullet \bullet \bullet \\ e^+e^- \rightarrow +) = 0.037. \\ = 0.027. We$	Γ_{54}/Γ $\Upsilon(4S)$ $\Upsilon(4S)$ We rescale to rescale to our Γ_{55}/Γ
$\frac{\Gamma(D_s^+ \overline{K}^0) / \Gamma_{\text{total}}}{<0.0011}$ ••• We do not use the <0.0019 100 ALEXANDER 93B re our best value B(D_s^+ 101 ALBRECHT 93E repor- best value B($D_s^+ \rightarrow$ $\Gamma(D_s^{*+} \overline{K}^0) / \Gamma_{\text{total}}$ <u>VALUE</u> <0.0011	$\frac{CL\%}{90}$ followin 90 ports < $\rightarrow \phi \pi$ orts < 2. $\phi \pi^+$) = $\frac{CL\%}{90}$	$\frac{DOCUMENT \ ID}{ALEXANDER}$ $100 \ ALEXANDER$ $101 \ ALBRECHT$ $10.3 \times 10^{-4} \ for \ B(0)$ $+) = 0.036.$ $5 \times 10^{-3} \ for \ B(D_s^+)$ $= 0.036.$ $\frac{DOCUMENT \ ID}{102} \ ALEXANDER$	93B CLE2 , fits, limits, 93E ARG $D_s^+ \rightarrow \phi \pi^-$ $T \rightarrow \phi \pi^+) =$ 93B CLE2	$\frac{COMMENT}{e^+e^- \rightarrow}$ etc. • • • $e^+e^- \rightarrow$ +) = 0.037. = 0.027. We $\frac{COMMENT}{e^+e^- \rightarrow}$	Γ_{54}/Γ $\Upsilon(4S)$ $\Upsilon(4S)$ We rescale to our rescale to our Γ_{55}/Γ $\Upsilon(4S)$
$\frac{\Gamma(D_s^+ \overline{K}^0) / \Gamma_{\text{total}}}{\langle 0.0011}$ ••• We do not use the <0.0019 100 ALEXANDER 93B re our best value B(D_s^+ 101 ALBRECHT 93E repor- best value B($D_s^+ \rightarrow$ $\Gamma(D_s^{*+} \overline{K}^0) / \Gamma_{\text{total}}$ <u>VALUE</u> <0.0011 ••• We do not use the	$\frac{CL\%}{90}$ followin 90 ports < $\rightarrow \phi \pi$ orts < 2. $\phi \pi^+$) = $\frac{CL\%}{90}$ followin	<u>DOCUMENT ID</u> 100 ALEXANDER ng data for averages 101 ALBRECHT 10.3 \times 10 ⁻⁴ for B(+) = 0.036. 5 \times 10 ⁻³ for B(D_s^+ = 0.036. <u>DOCUMENT ID</u> 102 ALEXANDER ng data for averages	$\frac{TECN}{93B} \text{ CLE2}$, fits, limits, 93E ARG $D_s^+ \rightarrow \phi \pi^-$ $T \rightarrow \phi \pi^+$) = $\frac{TECN}{93B} \text{ CLE2}$, fits, limits,	$\frac{COMMENT}{e^+e^- \rightarrow}$ etc. • • • $e^+e^- \rightarrow$ +) = 0.037. = 0.027. We $\frac{COMMENT}{e^+e^- \rightarrow}$ etc. • • •	Γ_{54}/Γ $\Upsilon(4S)$ $\Upsilon(4S)$ We rescale to our Γ_{55}/Γ $\Upsilon(4S)$
$\frac{\Gamma(D_s^+ \overline{K}^0) / \Gamma_{\text{total}}}{\sqrt{ALUE}}$ <0.0011 ••• We do not use the <0.0019 100 ALEXANDER 93B re our best value B(D_s^+) 101 ALBRECHT 93E report best value B(D_s^+) \rightarrow $\Gamma(D_s^{*+} \overline{K}^0) / \Gamma_{\text{total}}$ <0.0011 ••• We do not use the <0.0023	$\frac{CL\%}{90}$ followin 90 ports < $\rightarrow \phi \pi$ orts < 2. $\phi \pi^+$) $\frac{CL\%}{90}$ followin 90	$\frac{DOCUMENT \ ID}{ALEXANDER}$ $100 \ ALEXANDER$ $101 \ ALBRECHT$ $10.3 \times 10^{-4} \ for \ B(t^{+}) = 0.036.$ $5 \times 10^{-3} \ for \ B(D_{s}^{+}) = 0.036.$ $\frac{DOCUMENT \ ID}{102} \ ALEXANDER$ $102 \ ALEXANDER$ $103 \ ALBRECHT$	$\frac{TECN}{93B \text{ CLE2}}$, fits, limits, 93E ARG $D_s^+ \rightarrow \phi \pi^-$ $T \rightarrow \phi \pi^+$) = $\frac{TECN}{93B \text{ CLE2}}$, fits, limits, 93E ARG	$\frac{COMMENT}{e^+e^- \rightarrow}$ etc. • • • $e^+e^- \rightarrow$ +) = 0.037. = 0.027. We $\frac{COMMENT}{e^+e^- \rightarrow}$ etc. • • • $e^+e^- \rightarrow$	Γ_{54}/Γ $\Upsilon(4S)$ $\Upsilon(4S)$ We rescale to our rescale to our Γ_{55}/Γ $\Upsilon(4S)$ $\Upsilon(4S)$
$\frac{\Gamma(D_s^+ \overline{K}^0) / \Gamma_{\text{total}}}{<0.0011}$ ••• We do not use the <0.0019 100 ALEXANDER 93B re our best value B(D_s^+ 101 ALBRECHT 93E repor- best value B($D_s^+ \rightarrow$ $\Gamma(D_s^{++} \overline{K}^0) / \Gamma_{\text{total}}$ <u>VALUE</u> <0.0011 ••• We do not use the <0.0023 102 ALEXANDER 93B re	$\frac{CL\%}{90}$ followin 90 ports < $\rightarrow \phi \pi$ orts < 2. $\phi \pi^+$) = $\frac{CL\%}{90}$ followin 90 ports <	<u>DOCUMENT ID</u> 100 ALEXANDER og data for averages 101 ALBRECHT 10.3 × 10 ⁻⁴ for B(+) = 0.036. 5 × 10 ⁻³ for B(D_s^+ = 0.036. <u>DOCUMENT ID</u> 102 ALEXANDER og data for averages 103 ALBRECHT 10.9 × 10 ⁻⁴ for B($\frac{TECN}{93B \text{ CLE2}}$, fits, limits, 93E ARG $D_s^+ \rightarrow \phi \pi^-$ $T \rightarrow \phi \pi^+$) = $\frac{TECN}{93B \text{ CLE2}}$, fits, limits, 93E ARG $D_s^+ \rightarrow \phi \pi^-$	$\frac{COMMENT}{e^+e^- \rightarrow}$ etc. • • • $e^+e^- \rightarrow$ +) = 0.037. = 0.027. We $\frac{COMMENT}{e^+e^- \rightarrow}$ etc. • • • $e^+e^- \rightarrow$ +) = 0.037.	$ \Gamma_{54}/\Gamma $ $ \Upsilon(4S) $ $ \Upsilon(4S) $ We rescale to our $ \Gamma_{55}/\Gamma $ $ \Upsilon(4S) $ We rescale to $ \Upsilon(4S) $
$\Gamma(D_{s}^{+}\overline{K}^{0})/\Gamma_{\text{total}}$ \xrightarrow{VALUE} <0.0011 ••• We do not use the <0.0019 100 ALEXANDER 93B resources our best value B(D_{s}^{+} 101 ALBRECHT 93E reported best value B($D_{s}^{+} \rightarrow$ $\Gamma(D_{s}^{*+}\overline{K}^{0})/\Gamma_{\text{total}}$	$\frac{CL\%}{90}$ followin 90 ports < $\rightarrow \phi \pi$ ports < 2. $\phi \pi^+$) = $\frac{CL\%}{90}$ followin 90 ports < $\rightarrow \phi \pi$	<u>DOCUMENT ID</u> 100 ALEXANDER ng data for averages 101 ALBRECHT 10.3 \times 10 ⁻⁴ for B(+) = 0.036. 5 \times 10 ⁻³ for B(D_s^+ = 0.036. <u>DOCUMENT ID</u> 102 ALEXANDER ng data for averages 103 ALBRECHT 10.9 \times 10 ⁻⁴ for B(+) = 0.036.	$\frac{TECN}{93B} \text{ CLE2}$, fits, limits, 93E ARG $D_s^+ \rightarrow \phi \pi^-$ $T \rightarrow \phi \pi^+$) = $\frac{TECN}{93B} \text{ CLE2}$, fits, limits, 93E ARG $D_s^+ \rightarrow \phi \pi^-$	$\frac{COMMENT}{e^+e^- \rightarrow}$ etc. • • • $e^+e^- \rightarrow$ +) = 0.037. = 0.027. We $\frac{COMMENT}{e^+e^- \rightarrow}$ etc. • • • $e^+e^- \rightarrow$ +) = 0.037.	Γ_{54}/Γ $\Upsilon(4S)$ $\Upsilon(4S)$ We rescale to our Γ_{55}/Γ $\Upsilon(4S)$ $\Upsilon(4S)$ We rescale to
$\Gamma(D_{s}^{+}\overline{K}^{0})/\Gamma_{\text{total}}$ \xrightarrow{VALUE} <0.0011 ••• We do not use the <0.0019 100 ALEXANDER 93B resource our best value B(D_{s}^{+}) 101 ALBRECHT 93E reported best value B(D_{s}^{+}) $\Gamma(D_{s}^{*+}\overline{K}^{0})/\Gamma_{\text{total}}$	$\frac{CL\%}{90}$ followin 90 ports < $\rightarrow \phi \pi$ orts < 2. $\phi \pi^+$) $\frac{CL\%}{90}$ followin 90 ports < $\rightarrow \phi \pi$ orts < 3.	<u>DOCUMENT ID</u> 100 ALEXANDER 101 ALBRECHT 10.3 × 10 ⁻⁴ for B(+) = 0.036. 5 × 10 ⁻³ for B(D_s^+ = 0.036. <u>DOCUMENT ID</u> 102 ALEXANDER 103 ALBRECHT 10.9 × 10 ⁻⁴ for B(+) = 0.036. 1 × 10 ⁻³ for B(D_s^+	$\frac{TECN}{93B \text{ CLE2}},$ fits, limits, 93E ARG $D_s^+ \rightarrow \phi \pi^-$ $T \rightarrow \phi \pi^+) =$ $\frac{TECN}{93B \text{ CLE2}},$ fits, limits, 93E ARG $D_s^+ \rightarrow \phi \pi^-$ $T \rightarrow \phi \pi^+) =$	$\frac{COMMENT}{e^+e^- \rightarrow}$ etc. • • • $e^+e^- \rightarrow$ +) = 0.037. = 0.027. We $\frac{COMMENT}{e^+e^- \rightarrow}$ etc. • • • $e^+e^- \rightarrow$ +) = 0.037. = 0.027. We	$ \Gamma_{54}/\Gamma $ $ \Upsilon(4S) $ $ \Upsilon(4S) $ We rescale to our $ \Gamma_{55}/\Gamma $ $ \Upsilon(4S) $ $ \Upsilon(4S) $ We rescale to our $ \Upsilon(4S) $ $ \Upsilon(4S) $ $ \Upsilon(4S) $ $ \Upsilon(4S) $
$\Gamma(D_{s}^{+}\overline{K}^{0})/\Gamma_{total}$ <u>VALUE</u> <0.0011 ••• We do not use the <0.0019 100 ALEXANDER 93B re our best value B(D_{s}^{+} 101 ALBRECHT 93E report best value B($D_{s}^{+} \rightarrow$ $\Gamma(D_{s}^{*+}\overline{K}^{0})/\Gamma_{total}$ <u>VALUE</u> <0.0011 ••• We do not use the <0.0023 102 ALEXANDER 93B re our best value B(D_{s}^{+} 103 ALBRECHT 93E report best value B($D_{s}^{+} \rightarrow$	$\frac{CL\%}{90}$ followin 90 ports < $\rightarrow \phi \pi$ orts < 2. $\phi \pi^+$) : $\frac{CL\%}{90}$ followin 90 ports < $\rightarrow \phi \pi$ orts < 3. $\phi \pi^+$) :	<u>DOCUMENT ID</u> 100 ALEXANDER og data for averages 101 ALBRECHT 10.3 × 10 ⁻⁴ for B(+) = 0.036. 5 × 10 ⁻³ for B(D_s^+ = 0.036. <u>DOCUMENT ID</u> 102 ALEXANDER og data for averages 103 ALBRECHT 10.9 × 10 ⁻⁴ for B(+) = 0.036. 1 × 10 ⁻³ for B(D_s^+ = 0.036.	$\frac{TECN}{93B \text{ CLE2}},$ fits, limits, 93E ARG $D_s^+ \rightarrow \phi \pi^-$ $T \rightarrow \phi \pi^+) =$ $\frac{TECN}{93B \text{ CLE2}},$ fits, limits, 93E ARG $D_s^+ \rightarrow \phi \pi^-$ $T \rightarrow \phi \pi^+) =$	$\frac{COMMENT}{e^+e^- \rightarrow}$ etc. • • • $e^+e^- \rightarrow$ +) = 0.037. = 0.027. We $\frac{COMMENT}{e^+e^- \rightarrow}$ etc. • • • $e^+e^- \rightarrow$ +) = 0.037. = 0.027. We	$ \Gamma_{54}/\Gamma $ $ \Upsilon(4S) $ $ \Upsilon(4S) $ We rescale to our $ \Gamma_{55}/\Gamma $ $ \Upsilon(4S) $ $ \Upsilon(4S) $ We rescale to our $ \Upsilon(4S) $ $ \Upsilon(4S) $ $ \Upsilon(4S) $

$\Gamma(D_{\epsilon}^{+}\overline{K}^{*}(892)^{0})/$	Г _{total}	Г ₅₆ /
VALUE	<u>CL%</u>	DOCUMENT ID TECN COMMENT
<0.0005	90	104 ALEXANDER 93B CLE2 $e^+e^- ightarrow argama(4S)$
¹⁰⁴ ALEXANDER 93	3 reports	$<$ 4.4 $ imes$ 10 $^{-4}$ for B($D_c^+ ightarrow \phi \pi^+$) = 0.037. We rescale t
our best value B($D_{s}^{+} \rightarrow \phi$	$(\pi^+) = 0.036.$
$\Gamma(D_{s}^{*+}\overline{K}^{*}(892)^{0}))$	/Γ _{total}	Г57/
VALUE	CL%	DOCUMENT ID TECN COMMENT
<0.0004	90	105 ALEXANDER 93B CLE2 $e^+e^- o ~ arphi(4S)$
¹⁰⁵ ALEXANDER 93	3 reports	$<$ 4.3 $ imes$ 10 ⁻⁴ for B($D^+ \rightarrow \phi \pi^+$) = 0.037. We rescale t
our best value B($D_{s}^{+} \rightarrow \phi$	$(\pi^+) = 0.036.$
$\Gamma(D_{a}^{-}\pi^{+}K^{+})/\Gamma_{ta}$	tal	Г ₅₈ /
VALUE	<u>CL%</u>	DOCUMENT ID TECN COMMENT
<0.0008	90	106 ALBRECHT $$ 93e ARG $$ $e^+e^- ightarrowarphi(4S)$
106 ALBRECHT 93E	reports <	1.1×10^{-3} for B($D_{\perp}^+ \rightarrow \phi \pi^+$) = 0.027. We rescale to or
best value $B(D_s^+)$	$\rightarrow \phi \pi^+$) = 0.036.
$\Gamma(D_{-}^{*-}\pi^{+}K^{+})/\Gamma_{-}$	rotal	Г59/
VALUE	<u>CL%</u>	DOCUMENT ID TECN COMMENT
<0.0012	90	$107 \overline{\text{ALBRECHT}} 93E \overline{\text{ARG}} e^+e^- \rightarrow \Upsilon(4S)$
¹⁰⁷ ALBRECHT 93E	reports <	1.6×10^{-3} for B($D^+ \rightarrow \phi \pi^+$) = 0.027. We rescale to or
best value $B(D_s^+)$	$\rightarrow \phi \pi^+$) = 0.036.
$\Gamma(D_{-}^{-}\pi^{+}K^{*}(892))$	+)/Γ _{tota}	ы Гео/
VALUE	<u> </u>	DOCUMENT ID TECN COMMENT
<0.006	90	108 ALBRECHT 93E ARG $e^+e^- \rightarrow \Upsilon(4S)$
¹⁰⁸ ALBRECHT 93E	reports <	8.6×10^{-3} for B($D^+ \rightarrow \phi \pi^+$) = 0.027. We rescale to or
best value $B(D_s^+)$	$\rightarrow \phi \pi^+$) = 0.036.
$\Gamma(D_{s}^{*-}\pi^{+}K^{*}(892$)+)/Γ _{to1}	τal Γ ₆₁ /
VALUE	<u>CL%</u>	DOCUMENT ID TECN COMMENT
<0.008	90	109 ALBRECHT $$ 93E ARG $$ $e^+e^- ightarrow arphi(4S)$
¹⁰⁹ ALBRECHT 93E	reports <	1.1×10^{-2} for B($D^+ \rightarrow \phi \pi^+$) = 0.027. We rescale to or
best value $B(D_s^+)$	$\rightarrow \phi \pi^+$) = 0.036.
$\Gamma(J/\psi(1S)K^+)/\Gamma$	total	Γ ₆₂ /
VALUE (units 10^{-4})	VTS	DOCUMENT ID TECN COMMENT
10.0± 1.0 OUR AVE	RAGE	
$10.2 \pm \ 0.8 \pm 0.7$	11	⁰ JESSOP 97 CLE2 $e^+e^- \rightarrow \Upsilon(4S)$
$9.3\pm~3.1\pm0.2$	11	¹ BORTOLETTO92 CLEO $e^+e^- \rightarrow \Upsilon(4S)$
$8.1 \pm \ 3.5 \pm 0.1$	6 11	$^{\prime}$ ALBRECHT 90J ARG $e^+e^- ightarrow \Upsilon(4S)$

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

$11.0 \pm \ 1.5 \pm 0.9$	59	¹¹³ ALAM	94 CLE2	Repl. by JESSOP 97
22 ± 10 ± 2		BUSKULIC	92g ALEP	$e^+e^- \rightarrow Z$
7 ± 4	3	¹¹⁴ ALBRECHT	87d ARG	$e^+e^- ightarrow ~\Upsilon(4S)$
$10~\pm~7~\pm2$	3	¹¹⁵ BEBEK	87 CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
$9~\pm~5$	3	¹¹⁶ ALAM	86 CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

¹¹⁰ Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

- ¹¹¹BORTOLETTO 92 reports $8 \pm 2 \pm 2$ for $B(J/\psi(1S) \rightarrow e^+e^-) = 0.069 \pm 0.009$. We rescale to our best value $B(J/\psi(1S) \rightarrow e^+e^-) = (5.93 \pm 0.10) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.
- ¹¹² ALBRECHT 90J reports $7 \pm 3 \pm 1$ for $B(J/\psi(1S) \rightarrow e^+e^-) = 0.069 \pm 0.009$. We rescale to our best value $B(J/\psi(1S) \rightarrow e^+e^-) = (5.93 \pm 0.10) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.
- ¹¹³Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

¹¹⁴ ALBRECHT 87D assume $B^+ B^- / B^0 \overline{B}^0$ ratio is 55/45. Superseded by ALBRECHT 90J. ¹¹⁵ BEBEK 87 value has been updated in BERKELMAN 91 to use same assumptions as noted for BORTOLETTO 92.

¹¹⁶ ALAM 86 assumes B^{\pm}/B^0 ratio is 60/40.

 $\Gamma(J/\psi(1S)K^+\pi^+\pi^-)/\Gamma_{\text{total}}$ Γ_{63}/Γ VALUE CL% EVTS DOCUMENT ID TECN COMMENT 0.0014 ±0.0006 OUR AVERAGE $0.00140 \pm 0.00082 \pm 0.00002$ ¹¹⁷ BORTOLETTO92 CLEO $e^+e^- \rightarrow$ $\Upsilon(4S)$ ¹¹⁸ ALBRECHT $e^+e^- \rightarrow$ 6 87D ARG $0.00140 \pm 0.00091 \pm 0.00002$ • • • We do not use the following data for averages, fits, limits, etc. • • • ¹¹⁹ ALBRECHT 90J ARG $e^+e^- \rightarrow$ < 0.0019 90

¹¹⁷ BORTOLETTO 92 reports $0.0012 \pm 0.0006 \pm 0.0004$ for $B(J/\psi(1S) \rightarrow e^+e^-) = 0.069 \pm 0.009$. We rescale to our best value $B(J/\psi(1S) \rightarrow e^+e^-) = (5.93 \pm 0.10) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

- ¹¹⁸ ALBRECHT 87D reports 0.0012 ± 0.0008 for $B(J/\psi(1S) \rightarrow e^+e^-) = 0.069 \pm 0.009$. We rescale to our best value $B(J/\psi(1S) \rightarrow e^+e^-) = (5.93 \pm 0.10) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. They actually report 0.0011 ± 0.0007 assuming $B^+B^-/B^0\overline{B}^0$ ratio is 55/45. We rescale to 50/50. Analysis explicitly removes $B^+ \rightarrow \psi(2S)K^+$.
- ¹¹⁹ ALBRECHT 90J reports < 0.0016 for $B(J/\psi(1S) \rightarrow e^+e^-) = 0.069$. We rescale to our best value $B(J/\psi(1S) \rightarrow e^+e^-) = 0.0593$. Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

HTTP://PDG.LBL.GOV

 $\Upsilon(4S)$

$\Gamma(J/\psi(1S)K^*(892)^+)/\Gamma_{total}$

Г₆₄/Г

For polarization information see the Listings at the end of the " B^0 Branching Ratios" section.

VALUE	EVTS	DOCUMENT	ID	TECN	COMMENT
0.00148 ± 0.00027	OUR AVERAGE		_	_	
0.00141 ± 0.00023	± 0.00024	¹²⁰ JESSOP	97	CLE2	$e^+e^- ightarrow ~\Upsilon(4S)$
0.00158 ± 0.00047	± 0.00027	¹²¹ ABE	96H	CDF	<i>р р</i> at 1.8 ТеV
0.00151 ± 0.00109	± 0.00002	¹²² BORTOLE	TTO92	CLEO	$e^+e^- ightarrow ~\Upsilon(4S)$
$0.00186 \pm 0.00130 \pm$	±0.00003 2	¹²³ ALBRECH	T 90J	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
$\bullet \bullet \bullet$ We do not u	ise the following	data for averages	s, fits, lin	nits, etc.	. • • •
0.00178 ± 0.00051	±0.00023 13	¹²⁴ ALAM	94	CLE2	Sup. by JESSOP 97
¹²⁰ Assumes equal	production of B^-	$^+$ and B^0 at the	$\Upsilon(4S).$		
¹²¹ ABE 96H assur	nes that B(B^+ –	$\rightarrow J/\psi K^+) = ($	1.02 ± 0	.14) × 1	.0 ⁻³ .
122 BORTOLETTO) 92 reports 0.00	$013 \pm 0.0009 \pm$	0.0003 f	For $B(J/$	$\psi(1S) \rightarrow e^+e^-) =$
0.069 ± 0.009 .	We rescale to ou	ur best value B(J	$1/\psi(1S)$ -	$\rightarrow e^{+}e^{+}e^{+}e^{+}e^{-}e^{+}e^{-}e^{-}e^{-}e^{-}e^{-}e^{-}e^{-}e^{-$	$(-)^{(-)} = (5.93 + 0.10) \times$
10^{-2} . Our firs	st error is their e	periment's error	and our	second	error is the systematic
error from using	g our best value.	Assumes equal p	roductior	n of B^+	and B^0 at the $\Upsilon(4S)$.
¹²³ ALBRECHT 90	J reports 0.0016 :	$\pm 0.0011 \pm 0.000$	3 for B(J	$\psi(1S)$	$\rightarrow e^+e^-) = 0.069 \pm$
0.009. We reso	ale to our best v	value $B(J/\psi(1S))$	$\rightarrow e^+e^+$	e ⁻) = ($(5.93 \pm 0.10) \times 10^{-2}$
Our first error	is their experime	ent's error and o	ur secon	d error	is the systematic error
from using our	best value. Assu	mes equal produ	ction of I	B^+ and	B^0 at the $arphi(4S)$.
¹²⁴ Assumes equal	production of B^-	$^+$ and B^0 at the	$\Upsilon(4S).$		
					- /-
$I(J/\psi(15)K^{*}(8))$	392) ⁺)/Ι (<i>J/ψ</i>	$(15)K^{+})$			64/ 62
		DOCUMENT ID	<u></u>	<u>CN CO</u>	MMENT
1.52 ± 0.24 UUR A	VERAGE 12		07 (1	F0 .+	$\sim \gamma(4C)$
$1.45 \pm 0.20 \pm 0.17$	12	JESSUP	97 CL	E2 e'	$e \rightarrow I(4S)$
$1.92 \pm 0.00 \pm 0.17$		ADE	90Q CD	r pp)
¹²⁵ JESSOP 97 as	sumes equal prod	uction of B^+ and B^+ and B^+	id B ^U at	the $\Upsilon(4)$	(S). The measurement
			argeu and	i neutra	T States.
$\Gamma(J/\psi(1S)\pi^+)$	/Γ(<i>J/ψ</i> (1 <i>S</i>) <i>K</i> *	*)			Г ₆₅ /Г ₆₂
VALUE	EVTS	DOCUMENT	ID	TECN	COMMENT
0.051 ± 0.014 OUR	AVERAGE				
$0.05 \ \begin{array}{c} +0.019 \\ -0.017 \end{array} \pm 0.00$	01	ABE	96 R	CDF	<i>р<mark>р</mark></i> 1.8 ТеV
0.052 ± 0.024		BISHAI	96	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
$\bullet \bullet \bullet$ We do not u	ise the following	data for averages	s, fits, lin	nits, etc.	
0.043 ± 0.023	5	¹²⁶ ALEXAND	ER 95	CLE2	Sup. by BISHAI 96
126 Assumes equal	production of B^{-}	$^+B^-$ and $B^0\overline{B}^0$) on $\Upsilon(4$	<i>S</i>).	
$\Gamma(J/\psi(1S)\rho^+)$	/Ftotal				Гее/Г
VALUE	CL%	DOCUMENT ID	TEG	CN CO	MMENT
<7.7 × 10 ⁻⁴	90	BISHAI	96 CL	E2 e ⁺	$e^- ightarrow ~ \Upsilon(4S)$
$\Gamma(1/a)(1 \leq 1) \sim (1)$	260)+)/F				Г /Г
- (J/Ψ(13)a1(1	200J J/I total				167/I

HTTP://PDG.LBL.GOV

VALUE

 $< 1.2 \times 10^{-3}$

Page 22

DOCUMENT ID

BISHAI

<u>CL%</u>

90

TECN COMMENT

96 CLE2 $e^+e^- \rightarrow \Upsilon(4S)$

$\Gamma(\psi(2S)K^+)/\Gamma_{total}$				Г ₆₈ /Г		
VALUE (units 10^{-4})	<u>CL% EVTS</u>	DOCUMENT ID	TECN	COMMENT		
5.8 \pm 1.0 OUR AVER	AGE					
$5.5 \pm 1.0 \pm 0.6$		¹²⁷ ABE	980 CDF	<i>р р</i> 1.8 ТеV		
$6.1\pm~2.3\pm0.9$	7	¹²⁸ ALAM	94 CLE2	$e^+e^- \rightarrow \gamma(4S)$		
$18 \pm 8 \pm 4$	5	¹²⁸ ALBRECHT	90J ARG	$e^+e^- \rightarrow \gamma(4S)$		
\bullet \bullet \bullet We do not use the	following data t	for averages, fits, lin	nits, etc. • •	•		
< 5	90	¹²⁸ BORTOLETT	O92 CLEO	$e^+e^- \rightarrow \gamma(4S)$		
22 ±17	3	¹²⁹ ALBRECHT	87d ARG	$e^+e^- \rightarrow \gamma(4S)$		
¹²⁷ ABE 980 reports [B(E	$3^+ \rightarrow \psi(2S) K$	$(T^+)]/[B(B^+ \rightarrow J/a)]$	$\psi(1S)K^{+})] =$	=0.558 \pm 0.082 \pm		
0.056. We multiply by our best value $B(B^+ \rightarrow J/\psi(1S)K^+)=(9.9 \pm 1.0) \times 10^{-4}$. Our first error is their experiment's error and our second error is the systematic error from using our best value						
¹²⁸ Assumes equal produc	ction of B^+ and	B^0 at the $\Upsilon(4S)$.				
¹²⁹ ALBRECHT 87D assu	me $B^+ B^- / B^0$	\overline{B}^0 ratio is 55/45. S	Superseded by	ALBRECHT 90J.		

$\Gamma(\psi(2S)K^*(892)^+)/\Gamma_{total}$

<u>TECN</u> <u>COMME</u>NT VALUE <u>CL%</u> DOCUMENT ID ¹³⁰ ALAM 94 CLE2 90 <0.0030 $e^+e^- \rightarrow \Upsilon(4S)$ \bullet \bullet \bullet We do not use the following data for averages, fits, limits, etc. ¹³⁰ BORTOLETTO92 CLEO $e^+e^- \rightarrow ~\Upsilon(4S)$ < 0.0035 90 ¹³⁰ ALBRECHT 90J ARG $e^+e^- \rightarrow \Upsilon(4S)$ < 0.0049 90

¹³⁰Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

$\Gamma(\psi(2S)K^+\pi^+\pi^-)/\Gamma$	total				Г ₇₀ /Г
VALUE	EVTS	DOCUMENT ID	TECN	COMMENT	
$0.0019 \pm 0.0011 \pm 0.0004$	3	¹³¹ ALBRECHT	90J ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
101					

¹³¹ Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

$\Gamma(\chi_{c1}(1P)K^+)/\Gamma_{total}$					Г ₇₁ /Г
VALUE	/ <u>TS</u>	DOCUMENT ID	TECN	COMMENT	
0.0010 \pm 0.0004 OUR AVER/	AGE				
$0.00097 \!\pm\! 0.00040 \!\pm\! 0.00009$	6	¹³² ALAM	94 CLE2	$e^+e^- \rightarrow i$	$\Upsilon(4S)$
$0.0019 \ \pm 0.0013 \ \pm 0.0006$		¹³³ ALBRECHT	92e ARG	$e^+e^- \rightarrow i$	$\Upsilon(4S)$
100					

 132 Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. ¹³³ALBRECHT 92E assumes no $\chi_{c2}(1P)$ production and B($\Upsilon(4S) \rightarrow B^+B^-) = 50\%$.

$\Gamma(\chi_{c1}(1P)K^*(892)^+)/\Gamma_{total}$

(
VALUE	CL%	DOCUMENT ID		TECN	COMMENT		
<0.0021	90	¹³⁴ ALAM	94	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$	
134 Accumac aqual	production of	p + and p 0 at the	r(C)			

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

 Γ_{69}/Γ

 Γ_{72}/Γ

$\Gamma(\kappa^0\pi^+)/\Gamma_{total}$						Г ₇₃ /Г
VALUE (units 10^{-5})	<u>CL%</u>	DOCUMENT ID		TECN	COMMENT	
$2.3^{+1.1}_{-1.0}{\pm}0.36$		GODANG	98	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\bullet \bullet \bullet$ We do not use the	following d	lata for averages	, fits	, limits,	etc. • • •	
< 4.8	90	ASNER	96	CLE2	Repl. by G	ODANG 98
<19	90	ALBRECHT	91 B	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
<10	90 135	AVERY	89 B	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
<68	90	AVERY	87	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$^{135}_{\ \ to \ 50\%.}$ AVERY 89B reports $<$ to 50%.	9×10 ⁻⁵	assuming the γ	(45)	decays 4	43% to B ⁰ E	³⁰ . We rescale
$\Gamma(\kappa^+\pi^0)/\Gamma_{ m total}$						Г ₇₄ /Г
VALUE	<u>CL%</u>	DOCUMENT ID		TECN	COMMENT	
<1.6 × 10 ⁻⁵	90	GODANG	98	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
• • • We do not use the	following d	lata for averages	, fits	, limits,	etc. • • •	
$< 1.4 \times 10^{-5}$	90	ASNER	96	CLE2	Repl. by G	ODANG 98
Γ(η' K ⁺)/Γ _{total}		DOCUMENT ID		TECN	COMMENT	Г ₇₅ /Г
(c = +1.5 + o o) - to=5			00		+ -	22(4.6)
$(0.5 - 1.4 \pm 0.9) \times 10^{-9}$		BEHRENS	98	CLE2	$e \cdot e \rightarrow$	7 (45)
Г/ <i>"/ К</i> *(000)+)/Г	_					Г /Г
1 (1/ A (092))/1 tota				TECN	COMMENT	1 76/1
VALUE	<u>CL%</u>	DOCUMENT ID			COMMENT	
<1.3 × 10 ⁻⁴	90	BEHRENS	98	CLE2	$e^+e^- \rightarrow$	T (4S)
$\Gamma(\eta K^+)/\Gamma_{total}$						Г ₇₇ /Г
VALUE	<u>CL%</u>	DOCUMENT ID		TECN	COMMENT	
<1.4 × 10 ⁻⁵	90	BEHRENS	98	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\Gamma(\eta K^*(892)^+)/\Gamma_{\text{total}}$						Г ₇₈ /Г
VALUE	<u>CL%</u>	DOCUMENT ID		TECN	<u>COMMENT</u>	
$<3.0 \times 10^{-5}$	90	BEHRENS	98	CLE2	$e^+ e^- \rightarrow$	$\Upsilon(4S)$
$\Gamma(\omega K^+)/\Gamma_{total}$						Г79/Г
VALUE		DOCUMENT ID		TECN		,
$(1.5^{+0.7}_{-0.6}\pm 0.2) \times 10^{-5}$	136	BERGFELD	98	CLE2		
¹³⁶ Assumes equal produc	tion of B^+	and B ⁰ at the	$\Upsilon(4$	5).		
Г(., К *(802)+) /г			()	,		
	CL 0/	DOCUMENT ID		TECN		1 /08 I
VALUE	<u>LL%</u> 00 137		00			
<8./ × 10 5	90 137	BERGFELD	98	CLE2		
¹³⁷ Assumes equal produc	tion of B^+	and B^0 at the	Υ(4	<i>S</i>).		

I

$\Gamma(K^*(892)^0\pi^+)/1$	F _{total}		DOCUMENT ID		TECN	COMMENT	Г ₈₁ /Г
<u>~4 1 v 10=5</u>	00			06			$\Upsilon(\Lambda S)$
	90 the followi	ng c	ASINEN lata for average	90 s fits	LLL2	$e \cdot e \rightarrow$	7 (43)
		129		5, 1115	, iiiiics,		_
$<3.9 \times 10^{-4}$	90	130		96D	DLPH	$e^+e^- \rightarrow$	Ζ
$<4.8 \times 10^{-4}$	90	10.	ABREU	95N	DLPH	Sup. by A	DAM 96D
$<1.7 \times 10^{-4}$	90	140		91B	ARG	$e^+e^- \rightarrow + -$	T(4S)
$<1.5 \times 10^{-4}$	90	140	AVERY	89B	CLEO	$e e \rightarrow + -$	1(45)
<2.6 × 10 ⁺	90		AVERY	87	CLEO	$e e \rightarrow$	T (4S)
¹³⁸ ADAM 96D assur	nes $f_{B^0} =$	f _B -	$= 0.39$ and f_B	s = 0).12.		
¹³⁹ Assumes a B^0 , B ¹⁴⁰ AVERY 89B reported rescale to 50%. Г(K*(892)+π^0)/	rts < 1.3	ion f × 10	Fraction of 0.39) ^{—4} assuming t	and a he $ \Upsilon $	n <i>B_s pro</i> (4 <i>S</i>) do	oduction frac ecays 43% t	tion of 0.12. ο <i>Β⁰ Β̄⁰.</i> We Γες/Γ
			DOCUMENT ID		TECN	COMMENT	• 02/•
<u>~0 0 ~ 10-5</u>	00			06			$\Upsilon(\Lambda S)$
\3.3 \ 10	90		ASNER	90	CLLZ	e e →	7 (43)
$\Gamma(\kappa^+\pi^-\pi^+ \operatorname{nonre})$	esonant)/	Γ _{tot}	tal				Г ₈₃ /Г
VALUE	<u>CL%</u>		DOCUMENT ID		<u>TECN</u>	<u>COMMENT</u>	
<2.8 × 10 ⁻⁵	90		BERGFELD	96B	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
• • • We do not use	the followi	ng c	lata for average	s, fits	, limits,	etc. ● ● ●	
$< 3.3 \times 10^{-4}$	90	141	ADAM	96 D	DLPH	$e^+e^- \rightarrow$	Ζ
$< 4.0 \times 10^{-4}$	90	142	² ABREU	95N	DLPH	Sup. by A	DAM 96D
$< 3.3 \times 10^{-4}$	90		ALBRECHT	91E	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$< 1.9 \times 10^{-4}$	90	143	³ AVERY	89 B	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
141 ADAM 96D assum	nes $f_{P0} =$	f_{D-}	$= 0.39$ and f_B	= 0).12.		
 142 Assumes a B⁰, B 143 AVERY 89B report rescale to 50%. 	B° production R° production R° (1.7)	ы ion f × 10	Fraction of 0.39) ⁻⁴ assuming t	and a he γ	n B _s pro (4S) de	oduction frac ecays 43% t	rtion of 0.12. o <i>B⁰ B</i> ⁰ . We
$\Gamma(K^-\pi^+\pi^+ \operatorname{nonre})$	esonant)/	Γ _{tot}	tal				Г ₈₄ /Г
VALUE	<u> </u>		DOCUMENT ID		<u>TECN</u>	COMMENT	
$< 5.6 \times 10^{-5}$	90		BERGFELD	96 B	CLE2	$e^+e^- \rightarrow$	T(4S)
$\Gamma(K_1(1400)^0\pi^+))$	/Γ _{total}						Г ₈₅ /Г
VALUE	<u>CL%</u>		DOCUMENT ID		TECN	<u>COMMENT</u>	
$< 2.6 \times 10^{-3}$	90		ALBRECHT	91 B	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\Gamma(K_2^*(1430)^0\pi^+))$	/Γ _{total}						Г ₈₆ /Г
VALUE	<u>CL%</u>		DOCUMENT ID		TECN	COMMENT	
<6.8 × 10 ⁻⁴	90		ALBRECHT	91 B	ARG	$e^+e^- ightarrow$	$\Upsilon(4S)$

$\Gamma(K^+ \rho^0) / \Gamma_{\text{total}}$						Г ₈₇ /Г
VALUE	<u>CL%</u>		DOCUMENT ID		TECN	COMMENT
<1.9 × 10 ⁻⁵	90		ASNER	96	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the	followin	ng d	ata for averages	, fits	, limits,	etc. • • •
$< 1.2 \times 10^{-4}$	90	144	ADAM	96 D	DLPH	$e^+e^- \rightarrow Z$
$< 1.9 \times 10^{-4}$	90	145	ABREU	95N	DLPH	Sup. by ADAM 96D
$< 1.8 \times 10^{-4}$	90		ALBRECHT	91 B	ARG	$e^+e^- ightarrow ~\Upsilon(4S)$
$< 8 \times 10^{-5}$	90	146	AVERY	89 B	CLEO	$e^+e^- ightarrow ~\Upsilon(4S)$
$< 2.6 \times 10^{-4}$	90		AVERY	87	CLEO	$e^+e^- ightarrow ~\Upsilon(4S)$

 $^{144}\,\mathrm{ADAM}$ 96D assumes $\mathit{f}_{B^0}=\mathit{f}_{B^-}=$ 0.39 and $\mathit{f}_{B_s}=$ 0.12.

¹⁴⁵ Assumes a B^0 , B^- production fraction of 0.39 and a B_s production fraction of 0.12. ¹⁴⁶ AVERY 89B reports $< 7 \times 10^{-5}$ assuming the $\Upsilon(4S)$ decays 43% to $B^0 \overline{B}^0$. We rescale to 50%.

 $\Gamma(K^0 \rho^+) / \Gamma_{\text{total}}$ Γ₈₈/Γ VALUE CL% DOCUMENT ID TECN COMMENT $<4.8 \times 10^{-5}$ 90 $e^+e^- \rightarrow \Upsilon(4S)$ ASNER 96 CLE2 $\Gamma(K^*(892)^+\pi^+\pi^ \Gamma_{89}/\Gamma$)/F_{total} <u>VALUE</u> CL% DOCUMENT ID TECN COMMENT $< 1.1 \times 10^{-3}$ $e^+e^- \rightarrow \Upsilon(4S)$ 90 91E ARG ALBRECHT $\Gamma(K^*(892)^+ \rho^0) / \Gamma_{\text{total}}$ Γ₉₀/Γ VALUE CL% DOCUMENT ID TECN COMMENT <9.0 × 10⁻⁴ 90 $e^+e^- \rightarrow \Upsilon(4S)$ ALBRECHT 91B ARG $\Gamma(K_1(1400)^+ \rho^0) / \Gamma_{\text{total}}$ Γ₉₁/Γ VALUE TECN COMMENT CL% DOCUMENT ID <7.8 × 10⁻⁴ $e^+e^- \rightarrow \Upsilon(4S)$ 90 ALBRECHT 91B ARG $\Gamma(K_2^*(1430)^+ \rho^0) / \Gamma_{\text{total}}$ Γ_{92}/Γ VALUE CL% DOCUMENT ID TECN COMMENT <1.5 × 10⁻³ $e^+e^- \rightarrow \Upsilon(4S)$ 90 ALBRECHT 91B ARG $\Gamma(K^+\overline{K}^0)/\Gamma_{\text{total}}$ Г93/Г VALUE CL% DOCUMENT ID TECN COMMENT <2.1 × 10⁻⁵ 90 GODANG 98 CLE2 $e^+e^- \rightarrow \Upsilon(4S)$ $\Gamma(K^+K^-\pi^+ \text{ nonresonant})/\Gamma_{\text{total}}$ Г94/Г VALUE CL% DOCUMENT ID TECN COMMENT $< 7.5 \times 10^{-5}$ $e^+e^- \rightarrow \Upsilon(4S)$ 90 96B CLE2 BERGFELD $\Gamma(K^+K^+\pi^-\text{ nonresonant})/\Gamma_{\text{total}}$ Γ95/Γ VALUE CL% DOCUMENT ID TECN 00B OPAL $e^+e^- \rightarrow Z$ <8.79 × 10⁻⁵ 90 ABBIENDI



$\Gamma(K_1(1400)^+\phi)/\Gamma_t$	otal				Г ₁₀₂ /Г
VALUE	CL%	DOCUMENT ID	TECN	COMMENT	
<1.1 × 10 ⁻³	90	ALBRECHT	91b ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\Gamma(K_2^*(1430)^+\phi)/\Gamma_t$	otal				Г ₁₀₃ /Г
VALUE	CL%	DOCUMENT ID	TECN	COMMENT	
<3.4 × 10 ⁻³	90	ALBRECHT	91b ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\Gamma(K^+ f_0(980))/\Gamma_{tot}$	al				Г ₁₀₄ /Г
VALUE	CL%	DOCUMENT ID	TECN	<u>COMMENT</u>	
<8 × 10 ⁻⁵	90	¹⁵⁴ AVERY	89B CLEO	$e^+ e^- \rightarrow$	$\Upsilon(4S)$
¹⁵⁴ AVERY 89B reports to 50%.	$< 7 \times 1$	0^{-5} assuming the $arepsilon$	C(4S) decays	43% to B ⁰ E	3 ⁰ . We rescale

Γ(<i>K</i> *(892) ⁺	$(\gamma)/\Gamma_{total}$			Г ₁₀₅ /Г
VALUE	<u>CL%</u> E	EVTS DOCUME	NT ID TECN	COMMENT
(5.7±3.1±)	1.1) × 10 ^{—5}	5 ¹⁵⁵ AMMAR	R 93 CLE2	$e^+ e^- ightarrow \gamma(4S)$
• • • We do r	not use the following	data for averages,	fits, limits, etc. •	• •
< 5.5	$ imes$ 10 $^{-4}$ 90	¹⁵⁶ ALBRE	CHT 89G ARG	$e^+e^- \rightarrow \gamma(4S)$
< 5.5	$ imes$ 10 $^{-4}$ 90	¹⁵⁷ AVERY	89B CLEO	$e^+e^- \rightarrow \gamma(4S)$
< 1.8	$ imes 10^{-3}$ 90	AVERY	87 CLEO	$e^+e^- \rightarrow \gamma(4S)$
1				

 $^{155}\,\text{AMMAR}$ 93 observed 4.1 \pm 2.3 events above background.

 156 Assumes the $\,\Upsilon(4S)$ decays 45% to $B^0\overline{B}{}^0$

¹⁵⁷ Assumes the $\Upsilon(4S)$ decays 43% to $B^0 \overline{B}^0$.

$\Gamma(K_1(1270)^+\gamma)/\Gamma_{\text{total}}$

Γ_{106}/Γ VALUE <u>CL%</u> DOCUMENT ID TECN COMMENT ¹⁵⁸ ALBRECHT 90 89G ARG $e^+e^- \rightarrow \Upsilon(4S)$ < 0.0073

¹⁵⁸ ALBRECHT 89G reports < 0.0066 assuming the $\Upsilon(4S)$ decays 45% to $B^0 \overline{B}^0$. We rescale to 50%.

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

< 0.0022	90	159 ALBRECHT	896 ARG	_+
VALUE	CL%	DOCUMENT ID	TECN	COMMENT

 159 ALBRECHT 89G reports < 0.0020 assuming the $\Upsilon(4S)$ decays 45% to $B^0 \overline{B}^0$. We rescale to 50%.

$\Gamma(K_2^*(1430)^+\gamma)/\Gamma_{\text{total}}$

VALUE	<u>CL%</u>	DOCUMENT ID	TECN	COMMENT
<0.0014	90	¹⁶⁰ ALBRECHT	89g ARG	$e^+e^- ightarrow ~\Upsilon(4S)$

¹⁶⁰ ALBRECHT 89G reports < 0.0013 assuming the $\Upsilon(4S)$ decays 45% to $B^0 \overline{B}^0$. We rescale to 50%.

HTTP://PDG.LBL.GOV

 Γ_{107}/Γ

Γ₁₀₈/Γ

 $\Upsilon(4S)$

$\Gamma(K^*(1680)^+\gamma)/$	Γ _{total}				Γ ₁₀₉ /
VALUE	CL%	DOCUMENT ID	TECN	COMMENT	
<0.0019	90	¹⁶¹ ALBRECHT	89g ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
¹⁶¹ ALBRECHT 890 rescale to 50%.	S reports $<$	0.0017 assuming t	he $\Upsilon(4S)$ de	ecays 45% to	ь в ⁰ <u>в</u> 0. W
$\Gamma(K_3^*(1780)^+\gamma)/$	Γ _{total}				Γ ₁₁₀ /
VALUE	<u>CL%</u>	DOCUMENT ID	TECN	<u>COMMENT</u>	
<0.0055	90	¹⁶² ALBRECHT	89g ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$

¹⁶² ALBRECHT 89G reports < 0.005 assuming the $\Upsilon(4S)$ decays 45% to $B^0 \overline{B}^0$. We rescale to 50%.

$\Gamma(K_{A}^{*}(2045)^{+}\gamma)/\Gamma_{total}$

VALUE	<u>CL%</u>	DOCUMENT ID	TECN	COMMENT	
<0.0099	90	¹⁶³ ALBRECHT	89G ARG	$e^+e^- \rightarrow \Upsilon(4S)$	
163 AL PRECUT SOC	we we we the		$h = \gamma(AC) d =$	$AEQ/AE DO \overline{D}O$	۱۸/

ALBRECHT 89G reports < 0.0090 assuming the $\Upsilon(4S)$ decays 45% to $B^{U}\overline{B}^{U}$. We rescale to 50%.

$\Gamma(\pi^+\pi^0)/\Gamma_{total}$						Γ ₁₁₂ /Γ
VALUE	<u>CL%</u>	DOCUMENT ID		TECN	COMMENT	
<2.0 × 10 ⁻⁵	90	GODANG	98	CLE2	$e^+e^- ightarrow ~\gamma$	(4S)
\bullet \bullet \bullet We do not use the	following	data for averages	, fits	, limits,	etc. • • •	
$< 1.7 \times 10^{-5}$	90	ASNER	96	CLE2	Repl. by GO	DANG 98
$<2.4 \times 10^{-4}$ $<2.3 \times 10^{-3}$	90 10 90 16	⁴ ALBRECHT ⁵ BEBEK	90в 87	ARG CLEO	$egin{array}{ccc} e^+e^- & ightarrow & \gamma \ e^+e^- & ightarrow & \gamma \end{array}$	(4 <i>S</i>) (4 <i>S</i>)

¹⁶⁴ ALBRECHT 90B limit assumes equal production of $B^0 \overline{B}{}^0$ and $B^+ B^-$ at $\Upsilon(4S)$. ¹⁶⁵ BEBEK 87 assume the $\Upsilon(4S)$ decays 43% to $B^0 \overline{B}^0$.

$\Gamma(\pi^+\pi^+\pi^-)/\Gamma_{\text{total}}$						Г ₁₁₃ /Г
VALUE	<u>CL%</u>	DOCUMENT ID		TECN	COMMENT	
<1.3 × 10 ⁻⁴	90	¹⁶⁶ ADAM	96 D	DLPH	$e^+e^- \rightarrow Z$	
\bullet \bullet \bullet We do not use the	followi	ng data for averages	, fits	, limits,	etc. • • •	
$< 2.2 \times 10^{-4}$	90	¹⁶⁷ ABREU	95N	DLPH	Sup. by ADAM	96 D
$< 4.5 \times 10^{-4}$	90	¹⁶⁸ ALBRECHT	90 B	ARG	$e^+e^- \rightarrow \Upsilon(4)$	<i>S</i>)
$< 1.9 imes 10^{-4}$	90	¹⁶⁹ BORTOLETTO	089	CLEO	$e^+e^- \rightarrow \Upsilon(4)$	S)
166 ADAM OFD ASSUMPS	f . —	$f = 0.30$ and f_{-}	_ 0	12		

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

¹⁶⁷ Assumes a B^0 , B^- production fraction of 0.39 and a B_s production fraction of 0.12. ¹⁶⁸ ALBRECHT 90B limit assumes equal production of $B^0 \overline{B}{}^0$ and $B^+ B^-$ at $\Upsilon(4S)$. ¹⁶⁹ BORTOLETTO 89 reports < 1.7×10^{-4} assuming the $\Upsilon(4S)$ decays 43% to $B^0 \overline{B}{}^0$. We rescale to 50%.

$\Gamma(\rho^0 \pi^+)/\Gamma_{tota}$	1						Г ₁₁₄ /Г
VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT	
<4.3 × 10 ⁻⁵	90		ASNER	96	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$

HTTP://PDG.LBL.GOV

 Γ_{111}/Γ

'e

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

$< 1.6 \times 10^{-4}$	90		¹⁷⁰ ADAM	96 D	DLPH	$e^+e^- \rightarrow Z$
$< 2.6 \times 10^{-4}$	90		¹⁷¹ ABREU	95N	DLPH	Sup. by ADAM 96D
$< 1.5 imes 10^{-4}$	90		¹⁷² ALBRECHT	90 B	ARG	$e^+e^- ightarrow ~\Upsilon(4S)$
$< 1.7 \times 10^{-4}$	90		¹⁷³ BORTOLET	TO89	CLEO	$e^+e^- ightarrow ~\Upsilon(4S)$
$< 2.3 \times 10^{-4}$	90		¹⁷³ BEBEK	87	CLEO	$e^+e^- ightarrow ~\Upsilon(4S)$
$< 6 \times 10^{-4}$	90	0	GILES	84	CLEO	Repl. by BEBEK 87

 $^{170}\,\mathrm{ADAM}$ 96D assumes $\mathrm{f}_{B^0}=\mathrm{f}_{B^-}=$ 0.39 and $\mathrm{f}_{B_{\mathrm{S}}}=$ 0.12.

¹⁷¹ Assumes a B^0 , B^- production fraction of 0.39 and a B_s production fraction of 0.12. ¹⁷² ALBRECHT 90B limit assumes equal production of $B^0 \overline{B}{}^0$ and $B^+ B^-$ at $\Upsilon(4S)$. ¹⁷³ Papers assume the $\Upsilon(4S)$ decays 43% to $B^0 \overline{B}{}^0$. We rescale to 50%.

 $\frac{\left[\Gamma\left(K^{*}(892)^{0}\pi^{+}\right)+\Gamma\left(\rho^{0}\pi^{+}\right)\right]}{VALUE} / \Gamma_{total} \qquad (\Gamma_{81}-1)^{2} + 12 + 10^{-5} + 17^{4} \text{ ADAM} \qquad 96\text{ DLPH } e^{+}e^{-} \rightarrow Z$ $(\Gamma_{81} + \Gamma_{114})/\Gamma$ $^{174}\,\mathrm{ADAM}$ 96D assumes $f_{B^0}=f_{B^-}=0.39$ and $f_{B_s}=0.12.$ $\Gamma(\pi^+ f_0(980)) / \Gamma_{\text{total}}$ Γ_{115}/Γ $\frac{DOCUMENT ID}{175 \text{ BORTOLETTO89 } \text{ CLEO } e^+e^- \rightarrow \Upsilon(4S)$ <u>CL%</u> VALUE <1.4 × 10⁻⁴ 90 175 BORTOLETTO 89 reports $< 1.2 \times 10^{-4}$ assuming the $\Upsilon(4S)$ decays 43% to $B^0 \overline{B}^0$. We rescale to 50%. $\Gamma(\pi^+ f_2(1270))/\Gamma_{\text{total}}$ Γ_{116}/Γ DOCUMENT ID _____ TECN _____ COMMENT____ VALUE CL% 90 ¹⁷⁶ BORTOLETTO89 CLEO $e^+e^- \rightarrow \Upsilon(4S)$ $<2.4 \times 10^{-4}$ ¹⁷⁶BORTOLETTO 89 reports $< 2.1 \times 10^{-4}$ assuming the $\Upsilon(4S)$ decays 43% to $B^0 \overline{B}^0$. We rescale to 50%. $\Gamma(\pi^+\pi^-\pi^+ \text{ nonresonant})/\Gamma_{\text{total}}$ Γ_{117}/Γ DOCUMENT ID TECN COMMENT CL% $<4.1 \times 10^{-5}$ 96B CLE2 $e^+e^- \rightarrow \Upsilon(4S)$ 90 BERGFELD $\Gamma(\pi^+\pi^0\pi^0)/\Gamma_{\rm total}$ Γ_{118}/Γ CL% DOCUMENT ID TECN COMMENT $< 8.9 \times 10^{-4}$ 90 ¹⁷⁷ ALBRECHT $e^+e^- \rightarrow \Upsilon(4S)$ 90b ARG ¹⁷⁷ ALBRECHT 90B limit assumes equal production of $B^0 \overline{B}{}^0$ and $B^+ B^-$ at $\Upsilon(4S)$. $\Gamma(\rho^+\pi^0)/\Gamma_{\rm total}$ Γ₁₁₉/Γ DOCUMENT ID _____ TECN _____ COMMENT VALUE CL% $< 7.7 \times 10^{-5}$ 96 CLE2 $e^+e^- \rightarrow \Upsilon(4S)$ 90 ASNER • • • We do not use the following data for averages, fits, limits, etc. • • •

 $<5.5 \times 10^{-4}$ 90 ¹⁷⁸ ALBRECHT 90B ARG $e^+e^- \rightarrow \Upsilon(4S)$

¹⁷⁸ ALBRECHT 90B limit assumes equal production of $B^0 \overline{B}{}^0$ and $B^+ B^-$ at $\Upsilon(4S)$.

 $\Gamma(\pi^+\pi^-\pi^+\pi^0)/\Gamma_{\text{total}}$ Γ_{120}/Γ TECN COMMENT VALUE $<4.0 \times 10^{-3}$ ¹⁷⁹ ALBRECHT 90 90B ARG $e^+e^- \rightarrow \Upsilon(4S)$ ¹⁷⁹ALBRECHT 90B limit assumes equal production of $B^0 \overline{B}{}^0$ and $B^+ B^-$ at $\Upsilon(4S)$. $\Gamma(\rho^+ \rho^0) / \Gamma_{\text{total}}$ Γ_{121}/Γ VALUE DOCUMENT ID TECN COMMENT $<1.0 \times 10^{-3}$ 90 ¹⁸⁰ ALBRECHT $e^+e^- \rightarrow \Upsilon(4S)$ 90b ARG ¹⁸⁰ALBRECHT 90B limit assumes equal production of $B^0 \overline{B}{}^0$ and $B^+ B^-$ at $\Upsilon(4S)$. $\Gamma(a_1(1260)^+\pi^0)/\Gamma_{\text{total}}$ Γ_{122}/Γ VALUE DOCUMENT ID TECN <u>COMMENT</u> $e^+e^- \rightarrow \Upsilon(4S)$ $<1.7 \times 10^{-3}$ ¹⁸¹ ALBRECHT 90 90B ARG ¹⁸¹ ALBRECHT 90B limit assumes equal production of $B^0 \overline{B}{}^0$ and $B^+ B^-$ at $\Upsilon(4S)$. $\Gamma(a_1(1260)^0 \pi^+) / \Gamma_{\text{total}}$ Γ_{123}/Γ DOCUMENT ID VALUE TECN COMMENT ¹⁸² ALBRECHT < 9.0 × 10⁻⁴ 90 90B ARG $e^+e^- \rightarrow \Upsilon(4S)$ ¹⁸²ALBRECHT 90B limit assumes equal production of $B^0 \overline{B}{}^0$ and $B^+ B^-$ at $\Upsilon(4S)$. $\Gamma(\omega \pi^+)/\Gamma_{\text{total}}$ Γ_{124}/Γ VALUE DOCUMENT ID TECN COMMENT CL% $< 2.3 \times 10^{-5}$ ¹⁸³ BERGFELD 98 CLE2 90 • • • We do not use the following data for averages, fits, limits, etc. • • • ¹⁸⁴ ALBRECHT $< 4.0 \times 10^{-4}$ $e^+e^- \rightarrow \Upsilon(4S)$ 90 90b ARG ¹⁸³Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. ¹⁸⁴ ALBRECHT 90B limit assumes equal production of $B^0 \overline{B}{}^0$ and $B^+ B^-$ at $\Upsilon(4S)$. $\Gamma(\omega \rho^+)/\Gamma_{\text{total}}$ Γ_{125}/Γ VALUE DOCUMENT ID TECN $< 6.1 \times 10^{-5}$ ¹⁸⁵ BERGEELD 90 98 CLE2 ¹⁸⁵ Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. $\Gamma(\eta \pi^+)/\Gamma_{\text{total}}$ Γ_{126}/Γ <u>CL%</u> VALUE DOCUMENT ID TECN COMMENT $<1.5 \times 10^{-5}$ 98 CLE2 $e^+e^- \rightarrow \Upsilon(4S)$ 90 **BEHRENS** • • • We do not use the following data for averages, fits, limits, etc. • • • $< 7.0 \times 10^{-4}$ 90 ¹⁸⁶ ALBRECHT 90b ARG $e^+e^- \rightarrow \Upsilon(4S)$ ¹⁸⁶ ALBRECHT 90B limit assumes equal production of $B^0 \overline{B}{}^0$ and $B^+ B^-$ at $\Upsilon(4S)$. $\Gamma(\eta' \pi^+)/\Gamma_{\text{total}}$ Γ_{127}/Γ CL% VALUE DOCUMENT ID TECN COMMENT <3.1 × 10⁻⁵ 98 CLE2 $e^+e^- \rightarrow \Upsilon(4S)$ 90 **BEHRENS** $\Gamma(\eta' \rho^+) / \Gamma_{\text{total}}$ Γ_{128}/Γ DOCUMENT ID CL% TECN COMMENT <4.7 × 10⁻⁵ $e^+e^- \rightarrow \Upsilon(4S)$ 98 CLE2 90 BEHRENS HTTP://PDG.LBL.GOV Page 31 Created: 12/18/2000 15:06

$\Gamma(\eta ho^+)/\Gamma_{ ext{total}}$						Г ₁₂₉ /Г
VALUE	<u>CL%</u>	DOCUMENT ID		TECN	COMMENT	
<3.2 × 10 ⁻⁵	90	BEHRENS	98	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\Gamma(\phi \pi^+) / \Gamma_{ ext{total}}$						Г ₁₃₀ /Г
VALUE	<u>CL%</u>	DOCUMENT ID		TECN		
<0.5 × 10 ⁻⁵	90	¹⁸⁷ BERGFELD	98	CLE2		
¹⁸⁷ Assumes equal pr	oduction of	B^+ and B^0 at the	$e \Upsilon(4$	<i>S</i>).		
$\Gamma(\phi ho^+) / \Gamma_{ m total}$						Г ₁₃₁ /Г
VALUE _		DOCUMENT ID		TECN		
<1.6 × 10 ⁻⁵		¹⁸⁸ BERGFELD	98	CLE2		
¹⁸⁸ Assumes equal pr	oduction of	B^+ and B^0 at the	$r \gamma(4$	<i>S</i>).		
$\Gamma(\pi^+\pi^+\pi^+\pi^-\pi^-)$	⁻)/Γ _{total}					Г ₁₃₂ /Г
VALUE	<u>CL%</u>	DOCUMENT ID		TECN	<u>COMMENT</u>	
<8.6 × 10 ⁻⁴	90	¹⁸⁹ ALBRECHT	90 B	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
¹⁸⁹ ALBRECHT 90в	limit assume	es equal production	n of E	3 ⁰	nd B^+B^- a	at $\Upsilon(4S)$.
$\Gamma(\rho^0 a_1(1260)^+)/$	Γ _{total}					Г ₁₃₃ /Г
VALUE	<u>CL%</u>	DOCUMENT ID		TECN	<u>COMMENT</u>	
<6.2 × 10 ⁻⁴	90	¹⁹⁰ BORTOLETT	O89	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
• • • We do not use	the followin	g data for average	s, fits	s, limits,	etc. • • •	
$< 6.0 imes 10^{-4}$	90	¹⁹¹ ALBRECHT	90 B	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$< 3.2 \times 10^{-3}$	90	¹⁹⁰ BEBEK	87	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
¹⁹⁰ BORTOLETTO 8 101 We rescale to 509	89 reports < %.	$5.4 imes10^{-4}$ assume	ming	the $\Upsilon(4)$	1 <i>S</i>) decays 4	13% to $B^0\overline{B}^0$.
¹⁹¹ ALBRECHT 90B	limit assume	es equal production	n of E	3 ⁰ <i>B</i> ⁰ ai	nd B^+B^- a	at $\Upsilon(4S)$.
$\Gamma(ho^0 a_2(1320)^+)/$	Γ _{total}					Г ₁₃₄ /Г
VALUE	<u>CL%</u>	DOCUMENT ID		TECN	COMMENT	
<7.2 × 10 ⁻⁴	90	¹⁹² BORTOLETT	O89	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
• • • We do not use	the followin	g data for average	s, fits	s, limits,	etc. • • •	
$< 2.6 \times 10^{-3}$	90	¹⁹³ BEBEK	87	CLEO	$e^+e^- \rightarrow$	$\Upsilon(4S)$
¹⁹² BORTOLETTO	89 reports $<$	$6.3 imes10^{-4}$ assume the formula of the formul	ming	the $\Upsilon(4)$	4S) decays 4	13% to $B^0 \overline{B}^0$.
193 BEBEK 87reports to 50%.	$% . contract < 2.3 \times 10^{-1}$	$^{-3}$ assuming the γ	^(4 <i>S</i>)	decays	43% to <i>B</i> ⁰	3 ⁰ . We rescale
r(_+_+_+_+	- <i>_</i> π ⁰)/Γ.					
	")/' tot a			TECN	COMMENT	· 135/ ·
<u>~6 3 v 10=3</u>	00	<u>веснт</u> 194 лівреснт	000	ARC		$\Upsilon(\Lambda S)$
	limit conver		E E		, , , , , , , , , , , , , , , , , , ,	$\gamma(+3)$
ALBRECHT 90B	limit assume	es equal production	I OT E	s° B° ai		at 7 (45).
Γ(a ₁ (1260) ⁺ a ₁ (12	260) ⁰)/Γ _{to}	tal				Г ₁₃₆ /Г
VALUE	<u>CL%</u>	DOCUMENT ID		TECN	COMMENT	
<1.3 × 10 ⁻²	90	ALBRECHT	90 B	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
¹⁹⁵ ALBRECHT 90B	limit assume	es equal production	n of E	3 ⁰ <u>B</u> ⁰ ai	nd B^+B^- a	at $\Upsilon(4S)$.
		Pare 22		Creat	ed. 12/12	/2000 15.06
	L. U U V	i age Jz		Creat	.cu. 12/10	/ 2000 10.00

Created: 12/18/2000 15:06

$\Gamma(h^+\pi^0)/\Gamma_{\rm total}$						Г ₁₃₇ /Г
$h^+ = K^+ \text{ or } \pi^+$		DOCUMENT ID		TECN	COMMENT	
$(1.6^{+0.6}_{-0.5}\pm 0.36) \times 10^{-5}$	5	GODANG	98	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\Gamma(\omega h^+)/\Gamma_{\text{total}}$						Г ₁₃₈ /Г
$h^+ = K^+ \text{ or } \pi^+$				TECN		
$(2.5^{+0.8}_{-0.3} + 0.3) \times 10^{-5}$		¹⁹⁶ BERGEELD	98	CLE2		
196 Assumes equal produc	ction of	B^+ and B^0 at the	· Υ(Δ	5)		
$\Gamma(n=\pm)/\Gamma$			(.	<i>c</i>).		F /F
$(pp\pi')/(total)$	CI %	DOCUMENT I	ח	TECI	COMMEN	1 139/1
< 1.6 × 10 ⁻	4 90	¹⁹⁷ BEBEK	8 s fits	9 CLE	e^+e^-	$ ightarrow ~ \Upsilon(4S)$
$< 5.0 \times 10^{-10}$ (5.7±1.5±2.1) × 10 ⁻¹⁰⁷ 197 BEBEK 89 reports <	4_{90} 4 1 4 × 10	¹⁹⁸ ABREU ¹⁹⁹ ALBRECHT ⁻⁴ assuming the 2	9 8 7(45)	5N DLP 8F ARG	H Sup. by e^+e^-	ADAM 96D $\rightarrow \Upsilon(4S)$ $\overline{3}^0$ We rescale
to 50%.	roducti	on fraction of 0.30	and a	B pro	duction from	tion of 0.12
¹⁹⁹ ALBRECHT 88F repo $B^0\overline{B}^0$. We rescale to	orts (5.2 50%.	\pm 1.4 \pm 1.9) \times 10	-4 a	ssuming	the $\Upsilon(4S)$	decays 45% to
$\Gamma(p\overline{p}\pi^+ \text{ nonresonant})$)/Г _{tota}	I				Г ₁₄₀ /Г
<u>VALUE</u>	<u>CL%</u>	DOCUMENT ID	0.6-	<u>TECN</u>	<u>COMMENT</u>	22(1.6)
<5.3 × 10 °	90	BERGFELD	96 B	CLE2	$e + e \rightarrow$	7 (45)
$\Gamma(p\overline{p}\pi^+\pi^+\pi^-)/\Gamma_{\rm tot}$	al					Г ₁₄₁ /Г
<u>VALUE</u>	<u>CL%</u>	200 ALERECUT		<u>TECN</u>	<u>COMMENT</u>	22(1.5)
<5.2 × 10 ⁻⁺ 200 ALBRECHT 885 repo	90 orts < 1	200 ALBRECH I 7×10^{-4} assuming	88F	ARG $\gamma(4S)$	$e^+e^- \rightarrow$	T(4S)
rescale to 50%.			s inc	7 (43)		
$\Gamma(p\overline{p}K^+ \text{ nonresonant})$:)/Γ _{tota}	al				Γ ₁₄₂ /Γ
VALUE	<u>CL%</u>	DOCUMENT ID		TECN	COMMENT	
<8.9 × 10 ⁻⁵	90	BERGFELD	96 B	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
$\Gamma(p\overline{\Lambda})/\Gamma_{\text{total}}$						Г ₁₄₃ /Г
VALUE	<u>CL%</u>	DOCUMENT ID		TECN	COMMENT	
<2.6 × 10 ⁻⁶	90	²⁰¹ COAN	99	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
• • • VVe do not use the	followir	ng data for average	s, fits	, limits,	etc. ● ● ●	
$<6 \times 10^{-5}$ $<9.3 \times 10^{-5}$	90 90	²⁰² AVERY ²⁰³ ALBRECHT	89b 88f	CLEO ARG	$e^+ e^- \rightarrow e^+ e^- \rightarrow$	$\Upsilon(4S)$ $\Upsilon(4S)$
²⁰¹ Assumes equal produces 202 AVERY 80B reports	ction of 5×10	B^+ and B^0 at the γ^{-5} assuming the γ	$r \Upsilon(4)$	S).	43% to B07	$\overline{30}$ We rescale
203 ALBRECHT 88F reports rescale to 50%.	orts < 8	5×10^{-5} assuming	g the	$\Upsilon(4S)$	decays 45%	to $B^0 \overline{B}^0$. We

$\Gamma(\rho \overline{\Lambda} \pi^+ \pi^-) / \Gamma_{total}$							F144/F
VALUE	CL%		DOCUMENT ID		TECN	COMMENT	- 1
<2.0 × 10 ⁻⁴	90	204	ALBRECHT	88F	ARG	$e^+e^- \rightarrow$	$\Upsilon(4S)$
²⁰⁴ ALBRECHT 88F rep rescale to 50%.	orts < 3	1.8 ×	10 ⁻⁴ assuming	g the	$\Upsilon(4S)$ of	decays 45%	to <i>B⁰ B</i> ⁰ . We
$\Gamma(\overline{\Delta^0} p) / \Gamma_{\text{total}}$	CI %		DOCUMENT ID		TECN	COMMENT	Г ₁₄₅ /Г
$<38 \times 10^{-4}$	90	205		780		$e^+e^- \rightarrow$	$\Upsilon(4S)$
²⁰⁵ BORTOLETTO 89 r We rescale to 50%.	reports	< 3.	3×10^{-4} assur	ning	the $\Upsilon(4)$	S) decays 4	13% to $B^0 \overline{B}^0$.
$\Gamma(\Delta^{++}\overline{p})/\Gamma_{\text{total}}$	CI %		ΠΟΓΙΙΜΕΝΤ ΙΠ		TECN	COMMENT	Г ₁₄₆ /Г
<15 \times 10 ⁻⁴	90	206		780		$e^+e^- \rightarrow$	$\Upsilon(45)$
206 BORTOLETTO 89 r We rescale to 50%.	reports	< 1.	3×10^{-4} assur	ning	the $\Upsilon(4)$	S) decays 4	13% to $B^0\overline{B}^0$.
$\Gamma(\overline{\Lambda}_{c}^{-} p \pi^{+}) / \Gamma_{total}$							Г ₁₄₇ /Г
$VALUE$ (units 10^{-4})			DOCUMENT ID		TECN	COMMENT	
$6.2^{+2.3}_{-20}\pm 1.6$		207	FU	97	CLE2	$e^+e^- \rightarrow$	$\Upsilon(4S)$
²⁰⁷ FU 97 uses PDG 96	values o	of Λ_c	branching frac	tion.			
$\Gamma(\overline{\Lambda}_{c}^{-} p \pi^{+} \pi^{0}) / \Gamma_{\text{total}}$					TECH	601415NT	Г ₁₄₈ /Г
<u>VALUE</u>	<u>CL%</u>	208	DOCUMENT ID	07	$\frac{TECN}{CLE2}$	$\frac{COMMENT}{a^+a^-}$	$\Upsilon(AS)$
²⁰⁸ FU 97 uses PDG 96	90 values o	of Λ_c	branching ratio	97 D.	CLE2	$e \cdot e \rightarrow$	7 (43)
$\Gamma(\overline{\Lambda}^{-}_{c} p \pi^{+} \pi^{+} \pi^{-}) / \Gamma$	total						Г ₁₄₉ /Г
VALUE	<u>CL%</u>	200	DOCUMENT ID	~ 7	<u>TECN</u>	<u>COMMENT</u>	22(1.6)
<1.46 × 10 ⁹ ²⁰⁹ FU 97 uses PDG 96	90 values o	of Λ_c	FU branching ratio	97 5.	CLE2	e'e →	1 (45)
$\Gamma(\overline{\Lambda}_{c}^{-} p \pi^{+} \pi^{+} \pi^{-} \pi^{0})$	/Γ _{tota}	I	DOCUMENT ID		TECN	COMMENT	Г ₁₅₀ /Г
$\sim 1.34 \times 10^{-2}$	00	210	<u>DOCOMENTID</u>	07			$\Upsilon(\Lambda S)$
²¹⁰ FU 97 uses PDG 96	90 values o	of Λ_c	branching ratio	97 D.	CLE2	$e \cdot e \rightarrow$	7 (43)
$\Gamma(\pi^+ e^+ e^-) / \Gamma_{\text{total}}$ Test for $\Delta B = 1$	weak ne	eutral	l current. Allow	ed by	/ higher-	order electr	F₁₅₁/F oweak interac-
tions.	<i>c</i>			-	TECH	co	
<u>value</u>	<u> </u>	211	WFIR	00₽	<u>TECN</u> MRK2	$e^+e^- 20$	GeV
~			· · • • · · · ·	200			

 $^{211}\rm WEIR~90B$ assumes B^+ production cross section from LUND.

Г(π + <u></u>	$(\mu^+\mu^-)/\Gamma_{\rm total}$					Γ ₁₅₂ /Γ
ti	est for $\Delta B = 1$ works.	eak neu	tral current. Allowe	ed by	higher-	COMMENT
	1	<u>CL%</u>	212 WEID	000		$\frac{COMMENT}{a^{+}a^{-}} = 20 \text{ CeV}$
<0.009 212 _{WF}	IR 90B assumes <i>B</i>	90 ⁺ produ	WEIR	90B		<i>e'e</i> 29 GeV
Г (К +, т	$e^+e^-)/\Gamma_{total}$ Test for $\Delta B = 1$ w	veak neu	tral current. Allowe	ed by	higher-	- Γ <mark>153/Γ</mark> order electroweak interac-
ti VALUE	ons.	<u>CL%</u>	DOCUMENT ID		TECN	COMMENT
<6 ×	10 ⁻⁵	90	²¹³ AVERY	89 B	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
• • V	Ve do not use the	followin	g data for averages,	fits,	limits,	etc. • • •
<9.9 ×	10^{-5}	90	²¹⁴ ALBRECHT	91E	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
<6.8 ×	10^{-3}	90 2	215 WFIR	90B	MRK2	$e^+e^- 29 \text{ GeV}$
<25×	10^{-4}	90	216 AVERY	87	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
213 M/E	EDV 90D reports	50 E \(10^{-1})	-5 accuming the γ	(1E)	decover	$120/$ to $PO\overline{PO}$. We recert
214 ALE resc 215 WE 216 AVE to 5	30%. 3RECHT 91E repo ale to 50%. IR 90B assumes <i>B</i> ERY 87 reports < 50%.	s^+ produ $2.1 imes 10^{-1}$	$0 imes 10^{-5}$ assuming action cross section $^{-4}$ assuming the $\gamma($	the from (4 <i>S</i>)	$\Upsilon(4S)$ of LUND decays 4	decays 45% to $B^0\overline{B}^0$. We 40% to $B^0\overline{B}^0$. We rescale
΄(Κ+ Τ ti	$\mu^+\mu^-)/\Gamma_{ ext{total}}$ for $\Delta B = 1$ works.	veak neu <u>CL%</u>	tral current. Allowe <u>DOCUMENT ID</u>	ed by	higher-	Γ ₁₅₄ /Γ order electroweak interac-
<5.2 ×	10-6	90	217 AFFOLDER	99 8	CDF	$n\overline{n}$ at 1.8 TeV
• • V	Ve do not use the	followin	g data for averages.	fits.	limits.	etc. • • •
$<$ 1.0 \times	10 ⁻⁵	90	²¹⁸ ABE	96L	CDF	Repl. by AF-
<24 ×	10^{-4}	90	219 ALBRECHT	91F	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
<64 ×	10^{-3}	90	220 WFIR	90B	MRK2	$e^+e^- 29 \text{ GeV}$
<1.7 ×	10^{-4}	90	221 AVERY	89B	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
<3.8 ×	10^{-4}	90	222 AVERY	87	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
217 A Fr			$P^+ = P^+$	U.(10	$r = - \frac{1}{2}$	
²¹⁸ ABI ²¹⁹ ALE ²²⁰ WE ²²¹ AVE ²²¹ AVE 222 AVE to 5	E 96L measured re BRECHT 91E report ale to 50%. IR 90B assumes <i>B</i> ERY 89B reports tale to 50%. ERY 87 reports < 50%.	ative to orts $< 2.3 $ produce $< 1.5 \times 3.2 \times 10^{-1}$	$B^+ \rightarrow J/\psi(1S) F$ 2×10^{-4} assuming fuction cross section 10^{-4} assuming th $^{-4}$ assuming the $\Upsilon(1)$	$\varphi(12)$ the from from γ (4 <i>S</i>)	sing PD $\Upsilon(4S)$ of LUND (4S) de decays 4	DG 94 branching ratios. decays 45% to $B^0 \overline{B}^0$. We cays 43% to $B^0 \overline{B}^0$. We 40% to $B^0 \overline{B}^0$. We rescale
Г (К*(Т	892)⁺ $e^+ e^-$)/ Test for $\Delta B = 1$ we show that $\Delta B = 1$ we show the set of the	F_{total} veak neu	tral current. Allowe	ed by	higher-	Γ ₁₅₅ /Γ order electroweak interac-
VALUE		<u>CL%</u>	DOCUMENT ID		TECN	
<6.9 ×	10 ^{—4}	90	²²³ ALBRECHT	91E	ARG	$e^+ e^- ightarrow ~ \Upsilon(4S)$
²²³ ALE resc	BRECHT 91E repo cale to 50%.	orts < 6.3	$3 imes 10^{-4}$ assuming	the	Υ(4S) α	decays 45% to $B^0\overline{B}^0$. We
НТТР	://PDG.LBL.G	OV	Page 35		Create	ed: 12/18/2000 15:06

$\Gamma(K^*(892)^+\mu^+\mu^-$)/Г _{total}	l				Г ₁₅₆ /Г
Test for $\Delta B = 1$	1 weak n	eutral current. Allov	ved by	y higher-	order electrowea	ık interac-
VALUE	<u>CL%</u>	DOCUMENT ID		TECN	<u>COMMENT</u>	
<1.2 × 10 ⁻³	90	²²⁴ ALBRECHT	91E	ARG	$e^+e^- ightarrow ~\gamma(4)$	5)
²²⁴ ALBRECHT 91E re rescale to 50%.	eports <	$1.1 imes 10^{-3}$ assumin	g the	$\Upsilon(4S)$	decays 45% to <i>B</i>	0 <u> </u>
$\Gamma(\pi^+ e^+ \mu^-) / \Gamma_{\text{total}}$	l milv nun	ober conservation				Г ₁₅₇ /Г
VALUE	<u> </u>	DOCUMENT ID		TECN	COMMENT	
<0.0064	90	²²⁵ WEIR	90 B	MRK2	e^+e^- 29 GeV	
²²⁵ WEIR 90B assumes	s B^+ pro	duction cross section	n fror	n LUND		
$\Gamma(\pi^+ e^- \mu^+) / \Gamma_{\text{total}}$	l milv nun	nber conservation.				Г ₁₅₈ /Г
VALUE	<u>CL%</u>	DOCUMENT ID		TECN	<u>COMMENT</u>	
<0.0064	90	²²⁶ WEIR	90 B	MRK2	e^+e^- 29 GeV	
²²⁶ WEIR 90B assumes	s B^+ pro	duction cross section	n fror	n LUND		
$\Gamma(\kappa^+ e^+ \mu^-) / \Gamma_{\text{tota}}$ Test of lepton fa	il Imily nun	nber conservation.				Г ₁₅₉ /Г
VALUE	CL%	DOCUMENT ID		TECN	COMMENT	
<0.0064	90	²²⁷ WEIR	90 B	MRK2	<i>e</i> + <i>e</i> - 29 GeV	
I (K⁺ e⁻ μ⁺)/I tota Test of lepton fa <u>VALUE</u>	ni mily nun <u>CL%</u>	nber conservation.		<u>TECN</u>	COMMENT	₁₆₀ /
<0.0064	90	²²⁸ WEIR	90 B	MRK2	<i>e</i> + <i>e</i> - 29 GeV	
²²⁸ WEIR 90B assumes $\Gamma(\pi^- e^+ e^+)/\Gamma$	s B ⁺ pro	duction cross section	n fror	n LUND		Гаса /Г
Test of total lept	ton numl	per conservation.				. 101/.
VALUE	<u>CL%</u>	DOCUMENT ID		TECN	COMMENT	
<0.0039	90	²²⁹ WEIR	90 B	MRK2	<i>e</i> + <i>e</i> - 29 GeV	
²²⁹ WEIR 90B assumes	s B^+ pro	duction cross section	n fror	n LUND		
$\Gamma(\pi^{-}\mu^{+}\mu^{+})/\Gamma_{tota}$ Test of total lept	l ton numl	per conservation.				Г ₁₆₂ /Г
VALUE	<u>CL%</u>	DOCUMENT ID		TECN		
<0.0091 ²³⁰ WEIR 90B assumes	90 s <i>B</i> + pro	²³⁰ WEIR oduction cross section	90B n fror	MRK2 n LUND	<i>e</i> + <i>e</i> − 29 GeV	
$\Gamma(\pi^- e^+ \mu^+) / \Gamma_{\text{total}}$	l ton numl	per conservation.				Г ₁₆₃ /Г
VALUE	<u>CL%</u>	DOCUMENT ID		TECN	COMMENT	
<0.0064	90	²³¹ WEIR	90 B	MRK2	e^+e^- 29 GeV	
²³¹ WEIR 90B assumes	\mathbf{n}^{\pm}		_			
	s B∣ pro	duction cross section	n fror	n LUND		

$\Gamma(K^-e^+e^+)/\Gamma_{total}$						Г ₁₆₄ /Г
Test of total lepton	number	conservation.				
VALUE	CL%	DOCUMENT ID		TECN	COMMENT	
<0.0039	90 23	³² WEIR	90 B	MRK2	e^+e^- 29 GeV	
²³² WEIR 90B assumes <i>B</i>	⁺ produc	tion cross section	fron	n LUND		
$\Gamma(K^-\mu^+\mu^+)/\Gamma_{total}$						Г ₁₆₅ /Г
Test of total lepton	number	conservation.				
VALUE	CL%	DOCUMENT ID		TECN	COMMENT	
<0.0091	90 23	³³ WEIR	90 B	MRK2	e^+e^- 29 GeV	
²³³ WEIR 90B assumes <i>B</i>	⁺ produc	tion cross section	fron	n LUND		
$\Gamma(K^-e^+\mu^+)/\Gamma_{total}$						Г ₁₆₆ /Г
Test of total lepton	number	conservation.				
VALUE	<u>CL%</u>	DOCUMENT ID		TECN	COMMENT	
<0.0064	90 23	³⁴ WEIR	90 B	MRK2	e^+e^- 29 GeV	
²³⁴ WEIR 90B assumes <i>B</i>	⁺ produc	tion cross section	fron	n LUND		

B^{\pm} REFERENCES

ABBIENDI CSORNA ABBIENDI AFFOLDER BARTELT COAN ABE ABE ABE ACCIARRI ANASTASSOV ATHANAS	00B 00 99J 99B 99 98B 98O 98B 98O 98Q 98S 98 98S	PL B476 233 PR D61 111101 EPJ C12 609 PRL 83 3378 PRL 82 3746 PR D59 111101 PR D57 5382 PR D58 072001 PR D58 092002 PL B438 417 PRL 80 4127 PRL 80 5493	 G. Abbiendi et al. S.E. Csorna et al. G. Abbiendi et al. T. Affolder et al. J. Bartelt et al. T.E. Coan et al. F. Abe et al. F. Abe et al. F. Abe et al. M. Acciarri et al. Anastassov et al. M. Athanas et al. B. Deveta et al. 	(OPAL Collab.) (CLEO Collab.) (OPAL Collab.) (CDF Collab.) (CLEO Collab.) (CLEO Collab.) (CDF Collab.) (CDF Collab.) (CDF Collab.) (CLEO Collab.) (CLEO Collab.) (CLEO Collab.)
BEHRENS	98	PRL 80 3710	B.H. Behrens <i>et al.</i>	(CLEO Collab.)
BERGFELD	98	PRL 81 272	T. Bergfeld <i>et al.</i>	(CLEO Collab.)
CODANC	98	PRL 80 2762 PRL 80 3456	G. Brandenbrug <i>et al.</i>	(CLEO Collab.)
ARE	90 07 I	PRI 70 500	K Abe et al.	(SLD Collab.)
ACCIARRI	97F	PL B396 327	M. Acciarri <i>et al.</i>	(L3 Collab.)
ARTUSO	97	PL B399 321	M. Artuso <i>et al.</i>	(CLEO Collab.)
ATHANAS	97	PRL 79 2208	M. Athanas <i>et al.</i>	(CLEO Collab.)
BROWDER	97	PR D56 11	T. Browder <i>et al.</i>	(CLEO Collab.)
FU	97	PRL 79 3125	X. Fu <i>et al.</i>	(CLEO Collab.)
JESSOP	97	PRL 79 4533	C.P. Jessop <i>et al.</i>	(CLEO Collab.)
ABE	96B	PR D53 3496	F. Abe <i>et al.</i>	(CDF Collab.)
ABE	96C	PRL 76 4462	F. Abe <i>et al.</i>	(CDF Collab.)
ABE	96H	PRL 76 2015	F. Abe <i>et al.</i>	(CDF Collab.)
ABE	96L	PRL 76 4675	F. Abe <i>et al.</i>	(CDF Collab.)
ABE	96Q	PR D54 6596	F. Abe <i>et al.</i>	(CDF Collab.)
ABE	96R	PRL 77 5176	F. Abe <i>et al.</i>	(CDF Collab.)
ADAM	96D	ZPHY C72 207	W. Adam <i>et al.</i>	(DELPHI Collab.)
ASNER	96	PR D53 1039	D.M. Asner <i>et al.</i>	(CLEO Collab.)
BARISH	96B	PRL 76 1570	B.C. Barish <i>et al.</i>	(CLEO Collab.)
BERGFELD	96B	PRL 77 4503	T. Bergfeld <i>et al.</i>	(CLEO Collab.)
BISHAI	96	PL B369 186	M. Bishai <i>et al.</i>	(CLEO Collab.)
BUSKULIC	96 J	ZPHY C71 31	D. Buskulic <i>et al.</i>	(ALEPH Collab.)
GIBAUT	96	PR D53 4734	D. Gibaut <i>et al.</i>	(CLEO Collab.)
PDG	96	PR D54 1	R. M. Barnett <i>et al.</i>	
ABREU	95N	PL B357 255	P. Abreu <i>et al.</i>	(DELPHI Collab.)
ABREU	95Q	ZPHY C68 13	P. Abreu <i>et al.</i>	(DELPHI Collab.)
ADAM	95	ZPHY C68 363	W. Adam <i>et al.</i>	(DELPHI Collab.)
AKERS	95T	ZPHY C67 379	R. Akers <i>et al.</i>	(OPAL Collab.)
ALBRECHT	95D	PL B353 554	H. Albrecht <i>et al.</i>	(ARGUS Collab.)

HTTP://PDG.LBL.GOV Page 37 Created: 12/18/2000 15:06

ALEXANDER Also ARTUSO BARISH BUSKULIC ABE ALAM ALBRECHT ATHANAS Also PDG STONE	95 95C 95 95 94D 94 94D 94 94 95 94 94	PL B341 435 PL B347 469 (erratum) PRL 75 785 PR D51 1014 PL B343 444 PRL 72 3456 PR D50 43 PL B335 526 PRL 73 3503 PRL 74 3090 (erratum) PR D50 1173 HEPSY 93-11	J. Alexander et al. J. Alexander et al. M. Artuso et al. B.C. Barish et al. D. Buskulic et al. F. Abe et al. M.S. Alam et al. H. Albrecht et al. M. Athanas et al. M. Athanas et al. L. Montanet et al. S. Stone	(CLEO Collab.) (CLEO Collab.) (CLEO Collab.) (CLEO Collab.) (ALEPH Collab.) (CDF Collab.) (CDF Collab.) (ARGUS Collab.) (CLEO Collab.) (CLEO Collab.) (CLEO Collab.) (CLEO Collab.)
Published ir	ιВD	ecays, 2nd Edition, World	Scientific, Singapore	
ABREU	93D	ZPHY C57 181	P. Abreu <i>et al.</i>	(DELPHI Collab.)
ABREU	93G	PL B312 253	P. Abreu <i>et al.</i>	(DELPHI Collab.)
ACTON	93C	PL B307 247	P.D. Acton <i>et al.</i>	(OPAL Collab.)
ALBRECHI	93E	ZPHY C60 11	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
	93B	PL B319 305	J. Alexander <i>et al.</i>	(CLEO Collab.)
	03B 82	PRL /1 0/4 PRI 70 2681	A Boon of al	(CLEO Collab.)
BUSKIIIIC	03D	PL B307 104	D Buskulic et al	(ALEPH Collab.)
Also	93D 94H	PL B325 537 (errata)	D Buskulic et al	(ALEPH Collab.)
SANGHERA	93	PR D47 791	S. Sanghera <i>et al.</i>	(CLEO Collab.)
ALBRECHT	92C	PL B275 195	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
ALBRECHT	92E	PL B277 209	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
ALBRECHT	92G	ZPHY C54 1	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
BORTOLETTO	92	PR D45 21	D. Bortoletto et al.	(CLEO Collab.)
BUSKULIC	92G	PL B295 396	D. Buskulic <i>et al.</i>	(ALEPH Collab.)
ALBRECHT	91B	PL B254 288	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
ALBRECHT	91C	PL B255 297	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
ALBRECHI	91E	PL B262 148	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
BERKELMAN	91 PMa	ARNPS 41 1	K. Berkelman, S. Stone	(CORN, SYRA)
	01	DR D43 651	P. Fulton at al	(CLEO Collab.)
ALBRECHT	91 90R	PI R241 278	H Albrecht et al	(ARGUS Collab.)
ALBRECHT	901	7PHY C48 543	H Albrecht <i>et al</i>	(ARGUS Collab.)
ANTREASYAN	90B	ZPHY C48 553	D. Antreasvan <i>et al.</i>	(Crystal Ball Collab.)
BORTOLETTO	90	PRL 64 2117	D. Bortoletto <i>et al.</i>	(CLEO Collab.)
Also	92	PR D45 21	D. Bortoletto <i>et al.</i>	(CLEO Collab.)
WEIR	90B	PR D41 1384	A.J. Weir et al.	(Ňark II Collab.)
ALBRECHT	89G	PL B229 304	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
AVERY	89B	PL B223 470	P. Avery et al.	(CLEO Collab.)
BEBEK	89	PRL 62 8	C. Bebek <i>et al.</i>	(CLEO Collab.)
BORIOLEIIO	89	PRL 62 2436	D. Bortoletto <i>et al.</i>	(CLEO Collab.)
ALBRECHT		PL B209 119	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
	00N 07C	PL B213 424 DI D195 319	H. Albrecht et al.	(ARGUS Collab.)
	87D	PL B100 /51	H Albrecht et al.	(ARGUS Collab.)
AVERY	87	PL B183 429	P. Avery et al.	(CLEO Collab.)
BEBEK	87	PR D36 1289	C. Bebek <i>et al.</i>	(CLEO Collab.)
ALAM	86	PR D34 3279	M.S. Alam <i>et al.</i>	(CLEO Collab.)
PDG	86	PL 170B	M. Aguilar-Benitez <i>et al.</i>	(CERN, CIT+)
GILES	84	PR D30 2279	R. Giles <i>et al.</i>	(CLEO Collab.)