$B^{\pm}$ – THIS IS PART 1 OF 2

To reduce the size of this section's PostScript file, we have divided it into two PostScript files. We present the following index:

PART 1

PART 2

$B^{\pm}$

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

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

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

$B^{\pm}$ MASS

The fit uses m_{B^+}, $(m_{B^0} - m_{B^+})$, $m_{B^0_s}$, and $(m_{B^0_s} - (m_{B^+} + m_{B^0})/2)$ to determine m_{B^+}, m_{B^0}, $m_{B^0_s}$, and the mass differences.

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
5278.9±1.8 OUR FIT					
5278.9±1.5 OUR AVERAGE					
5279.1±1.7 ±1.4	147	[1] ABE	96B	CDF	$p\overline{p}$ at 1.8 TeV
5278.8±0.54±2.0	362	[2] ALAM	94	CLE2	$e^+e^- \to \Upsilon(4S)$
5278.3±0.4 ±2.0		[2] BORTOLETTO	92	CLEO	$e^+e^- \to \Upsilon(4S)$
5280.5±1.0 ±2.0		[2,3] ALBRECHT	90J	ARG	$e^+e^- \to \Upsilon(4S)$
5278.6±0.8 ±2.0		[2] BEBEK	87	CLEO	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
5275.8±1.3 ±3.0	32	ALBRECHT	87C	ARG	$e^+e^- \to \Upsilon(4S)$
5278.2±1.8 ±3.0	12	[4] ALBRECHT	87D	ARG	$e^+e^- \to \Upsilon(4S)$

[1] Excluded from fit because it is not independent of ABE 96B B^0_s mass and B^0_s-B mass difference.

[2] These experiments all report a common systematic error 2.0 MeV. We have artificially increased the systematic error to allow the experiments to be treated as independent measurements in our average. See "Treatment of Errors" section of the Introductory Text. These experiments actually measure the difference between half of E_{cm} and the B mass.

[3] ALBRECHT 90J assumes 10580 for $\Upsilon(4S)$ mass. Supersedes ALBRECHT 87C and ALBRECHT 87D.

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

$B^{\pm}$ MEAN LIFE

See $B^{\pm}/B^0/B^0_s/b$-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 b-flavored 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*
1.65±0.04 OUR EVALUATION					
1.68±0.07±0.02		[5] ABE	98B	CDF	$p\overline{p}$ at 1.8 TeV
1.66±0.06±0.05		[6] ABE	97J	SLD	$e^+e^- \to Z$
1.56±0.13±0.06		[7] ABE	96C	CDF	$p\overline{p}$ at 1.8 TeV

$1.58\pm0.09\pm0.04$		[7] BUSKULIC	96J	ALEP	$e^+e^- \rightarrow Z$
$1.58^{+0.21}_{-0.18}{}^{+0.04}_{-0.03}$	94	[5] BUSKULIC	96J	ALEP	$e^+e^- \rightarrow Z$
$1.61\pm0.16\pm0.12$		[7,8] ABREU	95Q	DLPH	$e^+e^- \rightarrow Z$
$1.72\pm0.08\pm0.06$		[9] ADAM	95	DLPH	$e^+e^- \rightarrow Z$
$1.52\pm0.14\pm0.09$		[7] AKERS	95T	OPAL	$e^+e^- \rightarrow Z$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$1.58\pm0.09\pm0.03$		[10] BUSKULIC	96J	ALEP	$e^+e^- \rightarrow Z$
1.70 ± 0.09		[11] ADAM	95	DLPH	$e^+e^- \rightarrow Z$
$1.61\pm0.16\pm0.05$	148	[5] ABE	94D	CDF	Repl. by ABE 98B
$1.30^{+0.33}_{-0.29}\pm0.16$	92	[7] ABREU	93D	DLPH	Sup. by ABREU 95Q
$1.56\pm0.19\pm0.13$	134	[9] ABREU	93G	DLPH	Sup. by ADAM 95
$1.51^{+0.30}_{-0.28}{}^{+0.12}_{-0.14}$	59	[7] ACTON	93C	OPAL	Sup. by AKERS 95T
$1.47^{+0.22}_{-0.19}{}^{+0.15}_{-0.14}$	77	[7] BUSKULIC	93D	ALEP	Sup. by BUSKULIC 96J

[5] Measured mean life using fully reconstructed decays.
[6] Data analyzed using charge of secondary vertex.
[7] Data analyzed using $D/D^*\ell X$ event vertices.
[8] ABREU 95Q assumes $B(B^0 \rightarrow D^{**-}\ell^+\nu_\ell) = 3.2 \pm 1.7\%$.
[9] Data analyzed using vertex-charge technique to tag B charge.
[10] Combined result of $D/D^*\ell X$ analysis and fully reconstructed B analysis.
[11] 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.

	Mode		Fraction (Γ_i/Γ)	Scale factor/ Confidence level
	Semileptonic and leptonic modes			
Γ_1	$\ell^+ \nu_\ell$ anything	[a]	(10.3 ± 0.9) %	
Γ_2	$\overline{D}^0 \ell^+ \nu_\ell$	[a]	(1.86 ± 0.33) %	
Γ_3	$\overline{D}^*(2007)^0 \ell^+ \nu_\ell$	[a]	(5.3 ± 0.8) %	
Γ_4	$\pi^0 e^+ \nu_e$		$< 2.2 \times 10^{-3}$	CL=90%
Γ_5	$\omega \ell^+ \nu_\ell$	[a]	$< 2.1 \times 10^{-4}$	CL=90%
Γ_6	$\omega \mu^+ \nu_\mu$			
Γ_7	$\rho^0 \ell^+ \nu_\ell$	[a]	$< 2.1 \times 10^{-4}$	CL=90%
Γ_8	$e^+ \nu_e$		$< 1.5 \times 10^{-5}$	CL=90%
Γ_9	$\mu^+ \nu_\mu$		$< 2.1 \times 10^{-5}$	CL=90%
Γ_{10}	$\tau^+ \nu_\tau$		$< 5.7 \times 10^{-4}$	CL=90%
Γ_{11}	$e^+ \nu_e \gamma$		$< 2.0 \times 10^{-4}$	CL=90%
Γ_{12}	$\mu^+ \nu_\mu \gamma$		$< 5.2 \times 10^{-5}$	CL=90%
	D, D^*, or D_s modes			
Γ_{13}	$\overline{D}^0 \pi^+$		$(5.3 \pm 0.5) \times 10^{-3}$	
Γ_{14}	$\overline{D}^0 \rho^+$		(1.34 ± 0.18) %	
Γ_{15}	$\overline{D}^0 \pi^+ \pi^+ \pi^-$		(1.1 ± 0.4) %	
Γ_{16}	$\overline{D}^0 \pi^+ \pi^+ \pi^-$ nonresonant		$(5 \pm 4) \times 10^{-3}$	
Γ_{17}	$\overline{D}^0 \pi^+ \rho^0$		$(4.2 \pm 3.0) \times 10^{-3}$	
Γ_{18}	$\overline{D}^0 a_1(1260)^+$		$(5 \pm 4) \times 10^{-3}$	
Γ_{19}	$D^*(2010)^- \pi^+ \pi^+$		$(2.1 \pm 0.6) \times 10^{-3}$	
Γ_{20}	$D^- \pi^+ \pi^+$		$< 1.4 \times 10^{-3}$	CL=90%
Γ_{21}	$\overline{D}^*(2007)^0 \pi^+$		$(4.6 \pm 0.4) \times 10^{-3}$	
Γ_{22}	$D^*(2010)^+ \pi^0$		$< 1.7 \times 10^{-4}$	CL=90%
Γ_{23}	$\overline{D}^*(2007)^0 \rho^+$		(1.55 ± 0.31) %	
Γ_{24}	$\overline{D}^*(2007)^0 \pi^+ \pi^+ \pi^-$		$(9.4 \pm 2.6) \times 10^{-3}$	

Γ_{25}	$\overline{D}^*(2007)^0 a_1(1260)^+$	(1.9 ±0.5) %		
Γ_{26}	$D^*(2010)^- \pi^+ \pi^+ \pi^0$	(1.5 ±0.7) %		
Γ_{27}	$D^*(2010)^- \pi^+ \pi^+ \pi^+ \pi^-$	< 1	%	CL=90%
Γ_{28}	$\overline{D}_1^*(2420)^0 \pi^+$	(1.5 ±0.6)	$\times 10^{-3}$	S=1.3
Γ_{29}	$\overline{D}_1^*(2420)^0 \rho^+$	< 1.4	$\times 10^{-3}$	CL=90%
Γ_{30}	$\overline{D}_2^*(2460)^0 \pi^+$	< 1.3	$\times 10^{-3}$	CL=90%
Γ_{31}	$\overline{D}_2^*(2460)^0 \rho^+$	< 4.7	$\times 10^{-3}$	CL=90%
Γ_{32}	$\overline{D}^0 D_s^+$	(1.3 ±0.4) %		
Γ_{33}	$\overline{D}^0 D_s^{*+}$	(9 ±4)	$\times 10^{-3}$	
Γ_{34}	$\overline{D}^*(2007)^0 D_s^+$	(1.2 ±0.5) %		
Γ_{35}	$\overline{D}^*(2007)^0 D_s^{*+}$	(2.7 ±1.0) %		
Γ_{36}	$D_s^+ \pi^0$	< 2.0	$\times 10^{-4}$	CL=90%
Γ_{37}	$D_s^{*+} \pi^0$	< 3.3	$\times 10^{-4}$	CL=90%
Γ_{38}	$D_s^+ \eta$	< 5	$\times 10^{-4}$	CL=90%
Γ_{39}	$D_s^{*+} \eta$	< 8	$\times 10^{-4}$	CL=90%
Γ_{40}	$D_s^+ \rho^0$	< 4	$\times 10^{-4}$	CL=90%
Γ_{41}	$D_s^{*+} \rho^0$	< 5	$\times 10^{-4}$	CL=90%
Γ_{42}	$D_s^+ \omega$	< 5	$\times 10^{-4}$	CL=90%
Γ_{43}	$D_s^{*+} \omega$	< 7	$\times 10^{-4}$	CL=90%
Γ_{44}	$D_s^+ a_1(1260)^0$	< 2.2	$\times 10^{-3}$	CL=90%
Γ_{45}	$D_s^{*+} a_1(1260)^0$	< 1.6	$\times 10^{-3}$	CL=90%
Γ_{46}	$D_s^+ \phi$	< 3.2	$\times 10^{-4}$	CL=90%
Γ_{47}	$D_s^{*+} \phi$	< 4	$\times 10^{-4}$	CL=90%
Γ_{48}	$D_s^+ \overline{K}^0$	< 1.1	$\times 10^{-3}$	CL=90%
Γ_{49}	$D_s^{*+} \overline{K}^0$	< 1.1	$\times 10^{-3}$	CL=90%
Γ_{50}	$D_s^+ \overline{K}^*(892)^0$	< 5	$\times 10^{-4}$	CL=90%
Γ_{51}	$D_s^{*+} \overline{K}^*(892)^0$	< 4	$\times 10^{-4}$	CL=90%
Γ_{52}	$D_s^- \pi^+ K^+$	< 8	$\times 10^{-4}$	CL=90%
Γ_{53}	$D_s^{*-} \pi^+ K^+$	< 1.2	$\times 10^{-3}$	CL=90%
Γ_{54}	$D_s^- \pi^+ K^*(892)^+$	< 6	$\times 10^{-3}$	CL=90%
Γ_{55}	$D_s^{*-} \pi^+ K^*(892)^+$	< 8	$\times 10^{-3}$	CL=90%
	Charmonium modes			
Γ_{56}	$J/\psi(1S) K^+$	(9.9 ±1.0)	$\times 10^{-4}$	
Γ_{57}	$J/\psi(1S) K^+ \pi^+ \pi^-$	(1.4 ±0.6)	$\times 10^{-3}$	
Γ_{58}	$J/\psi(1S) K^*(892)^+$	(1.47±0.27)	$\times 10^{-3}$	
Γ_{59}	$J/\psi(1S) \pi^+$	(5.0 ±1.5)	$\times 10^{-5}$	
Γ_{60}	$J/\psi(1S) \rho^+$	< 7.7	$\times 10^{-4}$	CL=90%

Γ_{61}	$J/\psi(1S)\,a_1(1260)^+$	$<\;1.2$	$\times 10^{-3}$	CL=90%
Γ_{62}	$\psi(2S)\,K^+$	$(\;6.9\;\pm 3.1\;)$	$\times 10^{-4}$	S=1.3
Γ_{63}	$\psi(2S)\,K^*(892)^+$	$<\;3.0$	$\times 10^{-3}$	CL=90%
Γ_{64}	$\psi(2S)\,K^+\pi^+\pi^-$	$(\;1.9\;\pm 1.2\;)$	$\times 10^{-3}$	
Γ_{65}	$\chi_{c1}(1P)\,K^+$	$(\;1.0\;\pm 0.4\;)$	$\times 10^{-3}$	
Γ_{66}	$\chi_{c1}(1P)\,K^*(892)^+$	$<\;2.1$	$\times 10^{-3}$	CL=90%

***K* or *K** modes**

Γ_{67}	$K^0\pi^+$	$(\;2.3\;\pm 1.1\;)$	$\times 10^{-5}$	
Γ_{68}	$K^+\pi^0$	$<\;1.6$	$\times 10^{-5}$	CL=90%
Γ_{69}	$\eta'\,K^+$	$(\;6.5\;\pm 1.7\;)$	$\times 10^{-5}$	
Γ_{70}	$\eta'\,K^*(892)^+$	$<\;1.3$	$\times 10^{-4}$	CL=90%
Γ_{71}	$\eta\,K^+$	$<\;1.4$	$\times 10^{-5}$	CL=90%
Γ_{72}	$\eta\,K^*(892)^+$	$<\;3.0$	$\times 10^{-5}$	CL=90%
Γ_{73}	$K^*(892)^0\pi^+$	$<\;4.1$	$\times 10^{-5}$	CL=90%
Γ_{74}	$K^*(892)^+\pi^0$	$<\;9.9$	$\times 10^{-5}$	CL=90%
Γ_{75}	$K^+\pi^-\pi^+$ nonresonant	$<\;2.8$	$\times 10^{-5}$	CL=90%
Γ_{76}	$K^-\pi^+\pi^+$ nonresonant	$<\;5.6$	$\times 10^{-5}$	CL=90%
Γ_{77}	$K_1(1400)^0\pi^+$	$<\;2.6$	$\times 10^{-3}$	CL=90%
Γ_{78}	$K_2^*(1430)^0\pi^+$	$<\;6.8$	$\times 10^{-4}$	CL=90%
Γ_{79}	$K^+\rho^0$	$<\;1.9$	$\times 10^{-5}$	CL=90%
Γ_{80}	$K^0\rho^+$	$<\;4.8$	$\times 10^{-5}$	CL=90%
Γ_{81}	$K^*(892)^+\pi^+\pi^-$	$<\;1.1$	$\times 10^{-3}$	CL=90%
Γ_{82}	$\quad K^*(892)^+\rho^0$	$<\;9.0$	$\times 10^{-4}$	CL=90%
Γ_{83}	$K_1(1400)^+\rho^0$	$<\;7.8$	$\times 10^{-4}$	CL=90%
Γ_{84}	$K_2^*(1430)^+\rho^0$	$<\;1.5$	$\times 10^{-3}$	CL=90%
Γ_{85}	$K^+\overline{K}^0$	$<\;2.1$	$\times 10^{-5}$	CL=90%
Γ_{86}	$K^+K^-\pi^+$ nonresonant	$<\;7.5$	$\times 10^{-5}$	CL=90%
Γ_{87}	$K^+K^-K^+$	$<\;2.0$	$\times 10^{-4}$	CL=90%
Γ_{88}	$\quad K^+\phi$	$<\;1.2$	$\times 10^{-5}$	CL=90%
Γ_{89}	$\quad K^+K^-K^+$ nonresonant	$<\;3.8$	$\times 10^{-5}$	CL=90%
Γ_{90}	$K^*(892)^+K^+K^-$	$<\;1.6$	$\times 10^{-3}$	CL=90%
Γ_{91}	$\quad K^*(892)^+\phi$	$<\;7.0$	$\times 10^{-5}$	CL=90%
Γ_{92}	$K_1(1400)^+\phi$	$<\;1.1$	$\times 10^{-3}$	CL=90%
Γ_{93}	$K_2^*(1430)^+\phi$	$<\;3.4$	$\times 10^{-3}$	CL=90%
Γ_{94}	$K^+f_0(980)$	$<\;8$	$\times 10^{-5}$	CL=90%
Γ_{95}	$K^*(892)^+\gamma$	$(\;5.7\;\pm 3.3\;)$	$\times 10^{-5}$	
Γ_{96}	$K_1(1270)^+\gamma$	$<\;7.3$	$\times 10^{-3}$	CL=90%
Γ_{97}	$K_1(1400)^+\gamma$	$<\;2.2$	$\times 10^{-3}$	CL=90%
Γ_{98}	$K_2^*(1430)^+\gamma$	$<\;1.4$	$\times 10^{-3}$	CL=90%
Γ_{99}	$K^*(1680)^+\gamma$	$<\;1.9$	$\times 10^{-3}$	CL=90%
Γ_{100}	$K_3^*(1780)^+\gamma$	$<\;5.5$	$\times 10^{-3}$	CL=90%
Γ_{101}	$K_4^*(2045)^+\gamma$	$<\;9.9$	$\times 10^{-3}$	CL=90%

Light unflavored meson modes

Γ_{102}	$\pi^+\pi^0$	$<$	2.0	$\times 10^{-5}$	CL=90%
Γ_{103}	$\pi^+\pi^+\pi^-$	$<$	1.3	$\times 10^{-4}$	CL=90%
Γ_{104}	$\rho^0\pi^+$	$<$	4.3	$\times 10^{-5}$	CL=90%
Γ_{105}	$\pi^+ f_0(980)$	$<$	1.4	$\times 10^{-4}$	CL=90%
Γ_{106}	$\pi^+ f_2(1270)$	$<$	2.4	$\times 10^{-4}$	CL=90%
Γ_{107}	$\pi^+\pi^-\pi^+$ nonresonant	$<$	4.1	$\times 10^{-5}$	CL=90%
Γ_{108}	$\pi^+\pi^0\pi^0$	$<$	8.9	$\times 10^{-4}$	CL=90%
Γ_{109}	$\rho^+\pi^0$	$<$	7.7	$\times 10^{-5}$	CL=90%
Γ_{110}	$\pi^+\pi^-\pi^+\pi^0$	$<$	4.0	$\times 10^{-3}$	CL=90%
Γ_{111}	$\rho^+\rho^0$	$<$	1.0	$\times 10^{-3}$	CL=90%
Γ_{112}	$a_1(1260)^+\pi^0$	$<$	1.7	$\times 10^{-3}$	CL=90%
Γ_{113}	$a_1(1260)^0\pi^+$	$<$	9.0	$\times 10^{-4}$	CL=90%
Γ_{114}	$\omega\pi^+$	$<$	4.0	$\times 10^{-4}$	CL=90%
Γ_{115}	$\eta\pi^+$	$<$	1.5	$\times 10^{-5}$	CL=90%
Γ_{116}	$\eta'\pi^+$	$<$	3.1	$\times 10^{-5}$	CL=90%
Γ_{117}	$\eta'\rho^+$	$<$	4.7	$\times 10^{-5}$	CL=90%
Γ_{118}	$\eta\rho^+$	$<$	3.2	$\times 10^{-5}$	CL=90%
Γ_{119}	$\pi^+\pi^+\pi^+\pi^-\pi^-$	$<$	8.6	$\times 10^{-4}$	CL=90%
Γ_{120}	$\rho^0 a_1(1260)^+$	$<$	6.2	$\times 10^{-4}$	CL=90%
Γ_{121}	$\rho^0 a_2(1320)^+$	$<$	7.2	$\times 10^{-4}$	CL=90%
Γ_{122}	$\pi^+\pi^+\pi^+\pi^-\pi^-\pi^0$	$<$	6.3	$\times 10^{-3}$	CL=90%
Γ_{123}	$a_1(1260)^+ a_1(1260)^0$	$<$	1.3	%	CL=90%

Baryon modes

Γ_{124}	$p\overline{p}\pi^+$	$<$	1.6	$\times 10^{-4}$	CL=90%
Γ_{125}	$p\overline{p}\pi^+$ nonresonant	$<$	5.3	$\times 10^{-5}$	CL=90%
Γ_{126}	$p\overline{p}\pi^+\pi^+\pi^-$	$<$	5.2	$\times 10^{-4}$	CL=90%
Γ_{127}	$p\overline{p}K^+$ nonresonant	$<$	8.9	$\times 10^{-5}$	CL=90%
Γ_{128}	$p\overline{\Lambda}$	$<$	6	$\times 10^{-5}$	CL=90%
Γ_{129}	$p\overline{\Lambda}\pi^+\pi^-$	$<$	2.0	$\times 10^{-4}$	CL=90%
Γ_{130}	$\overline{\Delta}^0 p$	$<$	3.8	$\times 10^{-4}$	CL=90%
Γ_{131}	$\Delta^{++}\overline{p}$	$<$	1.5	$\times 10^{-4}$	CL=90%
Γ_{132}	$\Lambda_c^- p\pi^+$		(6.2 $\pm$2.7)	$\times 10^{-4}$	
Γ_{133}	$\Lambda_c^- p\pi^+\pi^0$	$<$	3.12	$\times 10^{-3}$	CL=90%
Γ_{134}	$\Lambda_c^- p\pi^+\pi^+\pi^-$	$<$	1.46	$\times 10^{-3}$	CL=90%
Γ_{135}	$\Lambda_c^- p\pi^+\pi^+\pi^-\pi^0$	$<$	1.34	%	CL=90%

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

Γ_{136}	$\pi^+ e^+ e^-$	*B1*	<	3.9	$\times 10^{-3}$	CL=90%
Γ_{137}	$\pi^+ \mu^+ \mu^-$	*B1*	<	9.1	$\times 10^{-3}$	CL=90%
Γ_{138}	$K^+ e^+ e^-$	*B1*	<	6	$\times 10^{-5}$	CL=90%
Γ_{139}	$K^+ \mu^+ \mu^-$	*B1*	<	1.0	$\times 10^{-5}$	CL=90%
Γ_{140}	$K^*(892)^+ e^+ e^-$	*B1*	<	6.9	$\times 10^{-4}$	CL=90%
Γ_{141}	$K^*(892)^+ \mu^+ \mu^-$	*B1*	<	1.2	$\times 10^{-3}$	CL=90%
Γ_{142}	$\pi^+ e^+ \mu^-$	*LF*	<	6.4	$\times 10^{-3}$	CL=90%
Γ_{143}	$\pi^+ e^- \mu^+$	*LF*	<	6.4	$\times 10^{-3}$	CL=90%
Γ_{144}	$K^+ e^+ \mu^-$	*LF*	<	6.4	$\times 10^{-3}$	CL=90%
Γ_{145}	$K^+ e^- \mu^+$	*LF*	<	6.4	$\times 10^{-3}$	CL=90%
Γ_{146}	$\pi^- e^+ e^+$	*L*	<	3.9	$\times 10^{-3}$	CL=90%
Γ_{147}	$\pi^- \mu^+ \mu^+$	*L*	<	9.1	$\times 10^{-3}$	CL=90%
Γ_{148}	$\pi^- e^+ \mu^+$	*LF*	<	6.4	$\times 10^{-3}$	CL=90%
Γ_{149}	$K^- e^+ e^+$	*L*	<	3.9	$\times 10^{-3}$	CL=90%
Γ_{150}	$K^- \mu^+ \mu^+$	*L*	<	9.1	$\times 10^{-3}$	CL=90%
Γ_{151}	$K^- e^+ \mu^+$	*LF*	<	6.4	$\times 10^{-3}$	CL=90%

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

B^+ BRANCHING RATIOS

$\Gamma(\ell^+ \nu_\ell \text{anything})/\Gamma_{\text{total}}$ — Γ_1/Γ

VALUE	*DOCUMENT ID*		*TECN*	*COMMENT*
0.1025±0.0057±0.0065	[12] ARTUSO	97	CLE2	$e^+ e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.101 ±0.018 ±0.015	ATHANAS	94	CLE2	Sup. by ARTUSO 97

[12] ARTUSO 97 uses partial reconstruction of $B \to D^* \ell \nu_\ell$ and inclusive semileptonic branching ratio from BARISH 96B (0.1049 ± 0.0017 ± 0.0043).

$\Gamma(\overline{D}^0 \ell^+ \nu_\ell)/\Gamma_{\text{total}}$ — Γ_2/Γ

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

VALUE	*DOCUMENT ID*		*TECN*	*COMMENT*
0.0186±0.0033 OUR AVERAGE				
0.0194±0.0015±0.0034	[13] ATHANAS	97	CLE2	$e^+ e^- \to \Upsilon(4S)$
0.016 ±0.006 ±0.003	[14] FULTON	91	CLEO	$e^+ e^- \to \Upsilon(4S)$

[13] ATHANAS 97 uses missing energy and missing momentum to reconstruct neutrino.
[14] FULTON 91 assumes equal production of $B^0 \overline{B}^0$ and $B^+ B^-$ at the $\Upsilon(4S)$.

$\Gamma(\overline{D}^*(2007)^0 \ell^+ \nu_\ell)/\Gamma_{\text{total}}$ — Γ_3/Γ

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

VALUE	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
0.053 ±0.008 OUR AVERAGE					
0.0513±0.0054±0.0064	302	[15] BARISH	95	CLE2	$e^+ e^- \to \Upsilon(4S)$
0.066 ±0.016 ±0.015		[16] ALBRECHT	92C	ARG	$e^+ e^- \to \Upsilon(4S)$

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

seen	398	[17] SANGHERA	93	CLE2	$e^+e^- \to \Upsilon(4S)$
$0.041 \pm 0.008 {}^{+0.008}_{-0.009}$		[18] FULTON	91	CLEO	$e^+e^- \to \Upsilon(4S)$
$0.070 \pm 0.018 \pm 0.014$		[19] ANTREASYAN	90B	CBAL	$e^+e^- \to \Upsilon(4S)$

[15] BARISH 95 use B($D^0 \to K^-\pi^+$) = (3.91 ± 0.08 ± 0.17)% and B($D^{*0} \to D^0\pi^0$) = (63.6 ± 2.3 ± 3.3)%.

[16] ALBRECHT 92C reports 0.058±0.014±0.013. We rescale using the method described in STONE 94 but with the updated PDG 94 B($D^0 \to K^-\pi^+$). 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.

[19] ANTREASYAN 90B is average over B and $\overline{D}^*(2010)$ charge states.

$\Gamma(\pi^0 e^+\nu_e)/\Gamma_{total}$ — Γ_4/Γ

VALUE	*CL%*	*DOCUMENT ID*		*TECN*	*COMMENT*
<0.0022	90	ANTREASYAN	90B	CBAL	$e^+e^- \to \Upsilon(4S)$

$\Gamma(\omega\ell^+\nu_\ell)/\Gamma_{total}$ — Γ_5/Γ

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

VALUE	*CL%*	*DOCUMENT ID*		*TECN*	*COMMENT*
$<2.1 \times 10^{-4}$	90	[20] BEAN	93B	CLE2	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma(\omega\mu^+\nu_\mu)/\Gamma_{total}$ — Γ_6/Γ

VALUE	*DOCUMENT ID*		*TECN*
• • • We do not use the following data for averages, fits, limits, etc. • • •			
seen	[21] ALBRECHT	91C	ARG

[21] In ALBRECHT 91C, one event is fully reconstructed providing evidence for the $b \to u$ transition.

$\Gamma(\rho^0\ell^+\nu_\ell)/\Gamma_{total}$ — Γ_7/Γ

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

VALUE	*CL%*	*DOCUMENT ID*		*TECN*	*COMMENT*
$<2.1 \times 10^{-4}$	90	[22] BEAN	93B	CLE2	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma(e^+\nu_e)/\Gamma_{total}$ Γ_8/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<1.5 × 10^−5	90	ARTUSO	95	CLE2	$e^+e^- \to \Upsilon(4S)$

$\Gamma(\mu^+\nu_\mu)/\Gamma_{total}$ Γ_9/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<2.1 × 10^−5	90	ARTUSO	95	CLE2	$e^+e^- \to \Upsilon(4S)$

$\Gamma(\tau^+\nu_\tau)/\Gamma_{total}$ Γ_{10}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<5.7 × 10^−4	90	[23] ACCIARRI	97F	L3	$e^+e^- \to Z$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<1.04 \times 10^{-2}$	90	[24] ALBRECHT	95D	ARG	$e^+e^- \to \Upsilon(4S)$
$<2.2 \times 10^{-3}$	90	ARTUSO	95	CLE2	$e^+e^- \to \Upsilon(4S)$
$<1.8 \times 10^{-3}$	90	[25] BUSKULIC	95	ALEP	$e^+e^- \to Z$

[23] ACCIARRI 97F uses missing-energy technique and $f(b \to B^-) = (38.2 \pm 2.5)\%$.
[24] ALBRECHT 95D use full reconstruction of one B decay as tag.
[25] BUSKULIC 95 uses same missing-energy technique as in $\overline{b} \to \tau^+\nu_\tau X$, but analysis is restricted to endpoint region of missing-energy distribution.

$\Gamma(e^+\nu_e\gamma)/\Gamma_{total}$ Γ_{11}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<2.0 × 10^−4	90	[26] BROWDER	97	CLE2	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma(\mu^+\nu_\mu\gamma)/\Gamma_{total}$ Γ_{12}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<5.2 × 10^−5	90	[27] BROWDER	97	CLE2	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma(\overline{D}^0\pi^+)/\Gamma_{total}$ Γ_{13}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.0053±0.0005 OUR AVERAGE					
$0.0055\pm0.0004\pm0.0005$	304	[28] ALAM	94	CLE2	$e^+e^- \to \Upsilon(4S)$
$0.0050\pm0.0007\pm0.0006$	54	[29] BORTOLETTO	92	CLEO	$e^+e^- \to \Upsilon(4S)$
$0.0054^{+0.0018}_{-0.0015}{}^{+0.0012}_{-0.0009}$	14	[30] BEBEK	87	CLEO	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$0.0020\pm0.0008\pm0.0006$	12	[29] ALBRECHT	90J	ARG	$e^+e^- \to \Upsilon(4S)$
$0.0019\pm0.0010\pm0.0006$	7	[31] ALBRECHT	88K	ARG	$e^+e^- \to \Upsilon(4S)$

[28] ALAM 94 assume equal production of B^+ and B^0 at the $\Upsilon(4S)$ and use the CLEO II absolute $B(D^0 \to K^-\pi^+)$ and the PDG 1992 $B(D^0 \to K^-\pi^+\pi^0)/B(D^0 \to K^-\pi^+)$ and $B(D^0 \to K^-\pi^+\pi^+\pi^-)/B(D^0 \to K^-\pi^+)$.
[29] Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$ and uses the Mark III branching fractions for the D.
[30] BEBEK 87 value has been updated in BERKELMAN 91 to use same assumptions as noted for BORTOLETTO 92.
[31] ALBRECHT 88K assumes $B^0\overline{B}^0$:B^+B^- ratio is 45:55. Superseded by ALBRECHT 90J.

$\Gamma(\overline{D}^0 \rho^+)/\Gamma_{total}$ Γ_{14}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.0134±0.0018 OUR AVERAGE					
0.0135±0.0012±0.0015	212	[32] ALAM	94	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
0.013 ±0.004 ±0.004	19	[33] ALBRECHT	90J	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.021 ±0.008 ±0.009	10	[34] ALBRECHT	88K	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

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

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

[34] ALBRECHT 88K assumes $B^0\overline{B}^0$:B^+B^- ratio is 45:55.

$\Gamma(\overline{D}^0 \pi^+\pi^+\pi^-)/\Gamma_{total}$ Γ_{15}/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
0.0115±0.0029±0.0021	[35] BORTOLETTO92	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

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

$\Gamma(\overline{D}^0 \pi^+\pi^+\pi^- \text{ nonresonant})/\Gamma_{total}$ Γ_{16}/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
0.0051±0.0034±0.0023	[36] BORTOLETTO92	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

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

$\Gamma(\overline{D}^0 \pi^+\rho^0)/\Gamma_{total}$ Γ_{17}/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
0.0042±0.0023±0.0020	[37] BORTOLETTO92	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

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

$\Gamma(\overline{D}^0 a_1(1260)^+)/\Gamma_{total}$ Γ_{18}/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
0.0045±0.0019±0.0031	[38] BORTOLETTO92	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

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

$\Gamma(D^*(2010)^-\pi^+\pi^+)/\Gamma_{total}$ Γ_{19}/Γ

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
0.0021±0.0006 OUR AVERAGE						
0.0019±0.0007±0.0003		14	[39] ALAM	94	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
0.0026±0.0014±0.0007		11	[40] ALBRECHT	90J	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
$0.0024^{+0.0017}_{-0.0016}{}^{+0.0010}_{-0.0006}$		3	[41] BEBEK	87	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

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

<0.004	90		[42] BORTOLETTO	92	CLEO	$e^+e^- \to \Upsilon(4S)$
0.005 ±0.002 ±0.003		7	[43] ALBRECHT	87C	ARG	$e^+e^- \to \Upsilon(4S)$

[39] ALAM 94 assume equal production of B^+ and B^0 at the $\Upsilon(4S)$ and use the CLEO II $B(D^*(2010)^+ \to D^0\pi^+)$ and absolute $B(D^0 \to K^-\pi^+)$ and the PDG 1992 $B(D^0 \to K^-\pi^+\pi^0)/B(D^0 \to K^-\pi^+)$ and $B(D^0 \to K^-\pi^+\pi^+\pi^-)/B(D^0 \to K^-\pi^+)$.

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

[41] BEBEK 87 value has been updated in BERKELMAN 91 to use same assumptions as noted for BORTOLETTO 92.

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

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

$\Gamma(D^-\pi^+\pi^+)/\Gamma_{total}$ — Γ_{20}/Γ

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
<0.0014	90		[44] ALAM	94	CLE2	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<0.007	90		[45] BORTOLETTO	92	CLEO	$e^+e^- \to \Upsilon(4S)$
$0.0025^{+0.0041}_{-0.0023}{}^{+0.0024}_{-0.0008}$		1	[46] BEBEK	87	CLEO	$e^+e^- \to \Upsilon(4S)$

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

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

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

$\Gamma(\overline{D}^*(2007)^0\pi^+)/\Gamma_{total}$ — Γ_{21}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.0046 ±0.0004 OUR AVERAGE					
0.00434±0.00047±0.00018		[47] BRANDENB...	98	CLE2	$e^+e^- \to \Upsilon(4S)$
0.0052 ±0.0007 ±0.0007	71	[48] ALAM	94	CLE2	$e^+e^- \to \Upsilon(4S)$
0.0072 ±0.0018 ±0.0016		[49] BORTOLETTO	92	CLEO	$e^+e^- \to \Upsilon(4S)$
0.0040 ±0.0014 ±0.0012	9	[49] ALBRECHT	90J	ARG	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.0027 ±0.0044		[50] BEBEK	87	CLEO	$e^+e^- \to \Upsilon(4S)$

[47] 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 $B(D^* \to D\pi)$.

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

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

[50] 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 $B^0\overline{B}^0$.

$\Gamma(D^*(2010)^+\pi^0)/\Gamma_{total}$ — Γ_{22}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.00017	90	[51] BRANDENB... 98	CLE2	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma(\overline{D}^*(2007)^0\rho^+)/\Gamma_{total}$ — Γ_{23}/Γ

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
0.0155±0.0031 OUR AVERAGE				
0.0168±0.0021±0.0028	86	[52] ALAM 94	CLE2	$e^+e^- \to \Upsilon(4S)$
0.010 ±0.006 ±0.004	7	[53] ALBRECHT 90J	ARG	$e^+e^- \to \Upsilon(4S)$

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

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

$\Gamma(\overline{D}^*(2007)^0\pi^+\pi^+\pi^-)/\Gamma_{total}$ — Γ_{24}/Γ

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
0.0094±0.0020±0.0017	48	[54,55] ALAM 94	CLE2	$e^+e^- \to \Upsilon(4S)$

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

[55] 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 $\overline{D}^{*0}\pi^+\pi^+\pi^-$.)

$\Gamma(\overline{D}^*(2007)^0 a_1(1260)^+)/\Gamma_{total}$ — Γ_{25}/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
0.0188±0.0040±0.0034	[56,57] ALAM 94	CLE2	$e^+e^- \to \Upsilon(4S)$

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

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

$\Gamma(D^*(2010)^- \pi^+ \pi^+ \pi^0)/\Gamma_{total}$ Γ_{26}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.0150±0.0070±0.0003	26	[58] ALBRECHT	90J	ARG	$e^+ e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.043 ±0.013 ±0.026	24	[59] ALBRECHT	87C	ARG	$e^+ e^- \rightarrow \Upsilon(4S)$

[58] ALBRECHT 90J reports $0.018 \pm 0.007 \pm 0.005$ for $B(D^*(2010)^+ \rightarrow D^0 \pi^+) = 0.57 \pm 0.06$. We rescale to our best value $B(D^*(2010)^+ \rightarrow D^0 \pi^+) = (68.3 \pm 1.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$ and uses Mark III branching fractions for the D.

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

$\Gamma(D^*(2010)^- \pi^+ \pi^+ \pi^+ \pi^-)/\Gamma_{total}$ Γ_{27}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.01	90	[60] ALBRECHT	90J	ARG	$e^+ e^- \rightarrow \Upsilon(4S)$

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

$\Gamma(\overline{D}_1^*(2420)^0 \pi^+)/\Gamma_{total}$ Γ_{28}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.0015±0.0006 OUR AVERAGE	Error includes scale factor of 1.3.				
0.0011±0.0005±0.0002	8	[61] ALAM	94	CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$
0.0025±0.0007±0.0006		[62] ALBRECHT	94D	ARG	$e^+ e^- \rightarrow \Upsilon(4S)$

[61] 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 $B(D_1(2420)^0 \rightarrow D^*(2010)^+ \pi^-) = 67\%$.

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

$\Gamma(\overline{D}_1^*(2420)^0 \rho^+)/\Gamma_{total}$ Γ_{29}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0014	90	[63] ALAM	94	CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$

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

$\Gamma(\overline{D}_2^*(2460)^0 \pi^+)/\Gamma_{total}$ Γ_{30}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0013	90	[64] ALAM	94	CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.0028	90	[65] ALAM	94	CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$
<0.0023	90	[66] ALBRECHT	94D	ARG	$e^+ e^- \rightarrow \Upsilon(4S)$

[64] 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 $B(D_2^*(2460)^0 \rightarrow D^+ \pi^-) = 30\%$.

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

[66] ALBRECHT 94D assume equal production of B^+ and B^0 at the $\Upsilon(4S)$ and use the CLEO II $B(D^*(2010)^+ \to D^0\pi^+)$ and $B(D_2^*(2460)^0 \to D^*(2010)^+\pi^-) = 30\%$.

$\Gamma(\overline{D}{}_2^*(2460)^0\rho^+)/\Gamma_{total}$ Γ_{31}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0047	90	[67] ALAM	94	CLE2	$e^+e^- \to \Upsilon(4S)$
<0.005	90	[68] ALAM	94	CLE2	$e^+e^- \to \Upsilon(4S)$

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

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

$\Gamma(\overline{D}{}^0 D_s^+)/\Gamma_{total}$ Γ_{32}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.013 ±0.004 OUR AVERAGE					
$0.0122 \pm 0.0032 {}^{+0.0029}_{-0.0030}$		[69] GIBAUT	96	CLE2	$e^+e^- \to \Upsilon(4S)$
0.018 ±0.009 ±0.004		[70] ALBRECHT	92G	ARG	$e^+e^- \to \Upsilon(4S)$
0.016 ±0.007 ±0.004	5	[71] BORTOLETTO	90	CLEO	$e^+e^- \to \Upsilon(4S)$

[69] GIBAUT 96 reports $0.0126 \pm 0.0022 \pm 0.0025$ for $B(D_s^+ \to \phi\pi^+) = 0.035$. We rescale to our best value $B(D_s^+ \to \phi\pi^+) = (3.6 \pm 0.9) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[70] ALBRECHT 92G reports $0.024 \pm 0.012 \pm 0.004$ for $B(D_s^+ \to \phi\pi^+) = 0.027$. We rescale to our best value $B(D_s^+ \to \phi\pi^+) = (3.6 \pm 0.9) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes PDG 1990 D^0 branching ratios, e.g., $B(D^0 \to K^-\pi^+) = 3.71 \pm 0.25\%$.

[71] BORTOLETTO 90 reports 0.029 ± 0.013 for $B(D_s^+ \to \phi\pi^+) = 0.02$. We rescale to our best value $B(D_s^+ \to \phi\pi^+) = (3.6 \pm 0.9) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\overline{D}{}^0 D_s^{*+})/\Gamma_{total}$ Γ_{33}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
0.009 ±0.004 OUR AVERAGE				
$0.0084 \pm 0.0031 {}^{+0.0020}_{-0.0021}$	[72] GIBAUT	96	CLE2	$e^+e^- \to \Upsilon(4S)$
0.012 ±0.009 ±0.003	[73] ALBRECHT	92G	ARG	$e^+e^- \to \Upsilon(4S)$

[72] GIBAUT 96 reports $0.0087 \pm 0.0027 \pm 0.0017$ for $B(D_s^+ \to \phi\pi^+) = 0.035$. We rescale to our best value $B(D_s^+ \to \phi\pi^+) = (3.6 \pm 0.9) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

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

$\Gamma(\overline{D}^*(2007)^0 D_s^+)/\Gamma_{total}$ Γ_{34}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
0.012±0.005 OUR AVERAGE				
0.014±0.005±0.003	[74] GIBAUT	96	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
0.010±0.007±0.002	[75] ALBRECHT	92G	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

[74] 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.

[75] 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 ± 0.25% and B($D^*(2007)^0 \rightarrow D^0\pi^0$) = 55 ± 6%.

$\Gamma(\overline{D}^*(2007)^0 D_s^{*+})/\Gamma_{total}$ Γ_{35}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
0.027±0.010 OUR AVERAGE				
0.030±0.011±0.007	[76] GIBAUT	96	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
0.023±0.013±0.006	[77] ALBRECHT	92G	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

[76] 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.

[77] 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 ± 0.25% and B($D^*(2007)^0 \rightarrow D^0\pi^0$) = 55 ± 6%.

$\Gamma(D_s^+\pi^0)/\Gamma_{total}$ Γ_{36}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.00020	90	[78] ALEXANDER	93B	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

[78] ALEXANDER 93B reports $< 2.0 \times 10^{-4}$ for B($D_s^+ \rightarrow \phi\pi^+$) = 0.037. We rescale to our best value B($D_s^+ \rightarrow \phi\pi^+$) = 0.036.

$[\Gamma(D_s^+\pi^0) + \Gamma(D_s^{*+}\pi^0)]/\Gamma_{total}$ $(\Gamma_{36}+\Gamma_{37})/\Gamma$

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0007	90	[79] ALBRECHT	93E	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

[79] ALBRECHT 93E reports $< 0.9 \times 10^{-3}$ for B($D_s^+ \rightarrow \phi\pi^+$) = 0.027. We rescale to our best value B($D_s^+ \rightarrow \phi\pi^+$) = 0.036.

$\Gamma(D_s^{*+}\pi^0)/\Gamma_{total}$ Γ_{37}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.00033	90	[80] ALEXANDER	93B	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

[80] ALEXANDER 93B reports $< 3.2 \times 10^{-4}$ for B($D_s^+ \rightarrow \phi\pi^+$) = 0.037. We rescale to our best value B($D_s^+ \rightarrow \phi\pi^+$) = 0.036.

$\Gamma(D_s^+ \eta)/\Gamma_{total}$ Γ_{38}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0005	90	[81] ALEXANDER 93B	CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$

[81] ALEXANDER 93B reports $< 4.6 \times 10^{-4}$ for B($D_s^+ \rightarrow \phi\pi^+$) = 0.037. We rescale to our best value B($D_s^+ \rightarrow \phi\pi^+$) = 0.036.

$\Gamma(D_s^{*+} \eta)/\Gamma_{total}$ Γ_{39}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0008	90	[82] ALEXANDER 93B	CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$

[82] ALEXANDER 93B reports $< 7.5 \times 10^{-4}$ for B($D_s^+ \rightarrow \phi\pi^+$) = 0.037. We rescale to our best value B($D_s^+ \rightarrow \phi\pi^+$) = 0.036.

$\Gamma(D_s^+ \rho^0)/\Gamma_{total}$ Γ_{40}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0004	90	[83] ALEXANDER 93B	CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$

[83] ALEXANDER 93B reports $< 3.7 \times 10^{-4}$ for B($D_s^+ \rightarrow \phi\pi^+$) = 0.037. We rescale to our best value B($D_s^+ \rightarrow \phi\pi^+$) = 0.036.

$\left[\Gamma(D_s^+ \rho^0) + \Gamma(D_s^+ \overline{K}^*(892)^0)\right]/\Gamma_{total}$ $(\Gamma_{40}+\Gamma_{50})/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0025	90	[84] ALBRECHT 93E	ARG	$e^+ e^- \rightarrow \Upsilon(4S)$

[84] ALBRECHT 93E reports $< 3.4 \times 10^{-3}$ for B($D_s^+ \rightarrow \phi\pi^+$) = 0.027. We rescale to our best value B($D_s^+ \rightarrow \phi\pi^+$) = 0.036.

$\Gamma(D_s^{*+} \rho^0)/\Gamma_{total}$ Γ_{41}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0005	90	[85] ALEXANDER 93B	CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$

[85] ALEXANDER 93B reports $< 4.8 \times 10^{-4}$ for B($D_s^+ \rightarrow \phi\pi^+$) = 0.037. We rescale to our best value B($D_s^+ \rightarrow \phi\pi^+$) = 0.036.

$\left[\Gamma(D_s^{*+} \rho^0) + \Gamma(D_s^{*+} \overline{K}^*(892)^0)\right]/\Gamma_{total}$ $(\Gamma_{41}+\Gamma_{51})/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0015	90	[86] ALBRECHT 93E	ARG	$e^+ e^- \rightarrow \Upsilon(4S)$

[86] ALBRECHT 93E reports $< 2.0 \times 10^{-3}$ for B($D_s^+ \rightarrow \phi\pi^+$) = 0.027. We rescale to our best value B($D_s^+ \rightarrow \phi\pi^+$) = 0.036.

$\Gamma(D_s^+ \omega)/\Gamma_{total}$ Γ_{42}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0005	90	[87] ALEXANDER 93B	CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<0.0025	90	[88] ALBRECHT 93E	ARG	$e^+ e^- \rightarrow \Upsilon(4S)$

[87] ALEXANDER 93B reports $< 4.8 \times 10^{-4}$ for B($D_s^+ \rightarrow \phi\pi^+$) = 0.037. We rescale to our best value B($D_s^+ \rightarrow \phi\pi^+$) = 0.036.

[88] ALBRECHT 93E reports $< 3.4 \times 10^{-3}$ for $B(D_s^+ \to \phi\pi^+) = 0.027$. We rescale to our best value $B(D_s^+ \to \phi\pi^+) = 0.036$.

$\Gamma(D_s^{*+}\omega)/\Gamma_{total}$ — Γ_{43}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0007	90	[89] ALEXANDER	93B	CLE2	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.0014	90	[90] ALBRECHT	93E	ARG	$e^+e^- \to \Upsilon(4S)$

[89] ALEXANDER 93B reports $< 6.8 \times 10^{-4}$ for $B(D_s^+ \to \phi\pi^+) = 0.037$. We rescale to our best value $B(D_s^+ \to \phi\pi^+) = 0.036$.

[90] ALBRECHT 93E reports $< 1.9 \times 10^{-3}$ for $B(D_s^+ \to \phi\pi^+) = 0.027$. We rescale to our best value $B(D_s^+ \to \phi\pi^+) = 0.036$.

$\Gamma(D_s^+ a_1(1260)^0)/\Gamma_{total}$ — Γ_{44}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0022	90	[91] ALBRECHT	93E	ARG	$e^+e^- \to \Upsilon(4S)$

[91] ALBRECHT 93E reports $< 3.0 \times 10^{-3}$ for $B(D_s^+ \to \phi\pi^+) = 0.027$. We rescale to our best value $B(D_s^+ \to \phi\pi^+) = 0.036$.

$\Gamma(D_s^{*+} a_1(1260)^0)/\Gamma_{total}$ — Γ_{45}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0016	90	[92] ALBRECHT	93E	ARG	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma(D_s^+\phi)/\Gamma_{total}$ — Γ_{46}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.00032	90	[93] ALEXANDER	93B	CLE2	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.0013	90	[94] ALBRECHT	93E	ARG	$e^+e^- \to \Upsilon(4S)$

[93] ALEXANDER 93B reports $< 3.1 \times 10^{-4}$ for $B(D_s^+ \to \phi\pi^+) = 0.037$. We rescale to our best value $B(D_s^+ \to \phi\pi^+) = 0.036$.

[94] ALBRECHT 93E reports $< 1.7 \times 10^{-3}$ for $B(D_s^+ \to \phi\pi^+) = 0.027$. We rescale to our best value $B(D_s^+ \to \phi\pi^+) = 0.036$.

$\Gamma(D_s^{*+}\phi)/\Gamma_{total}$ — Γ_{47}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0004	90	[95] ALEXANDER	93B	CLE2	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.0016	90	[96] ALBRECHT	93E	ARG	$e^+e^- \to \Upsilon(4S)$

[95] ALEXANDER 93B reports $< 4.2 \times 10^{-4}$ for $B(D_s^+ \to \phi\pi^+) = 0.037$. We rescale to our best value $B(D_s^+ \to \phi\pi^+) = 0.036$.

[96] ALBRECHT 93E reports $< 2.1 \times 10^{-3}$ for $B(D_s^+ \to \phi\pi^+) = 0.027$. We rescale to our best value $B(D_s^+ \to \phi\pi^+) = 0.036$.

$\Gamma(D_s^+ \overline{K}^0)/\Gamma_{total}$ Γ_{48}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0011	90	[97] ALEXANDER	93B	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.0019	90	[98] ALBRECHT	93E	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

[97] ALEXANDER 93B reports $< 10.3 \times 10^{-4}$ for $B(D_s^+ \rightarrow \phi\pi^+) = 0.037$. We rescale to our best value $B(D_s^+ \rightarrow \phi\pi^+) = 0.036$.

[98] ALBRECHT 93E reports $< 2.5 \times 10^{-3}$ for $B(D_s^+ \rightarrow \phi\pi^+) = 0.027$. We rescale to our best value $B(D_s^+ \rightarrow \phi\pi^+) = 0.036$.

$\Gamma(D_s^{*+} \overline{K}^0)/\Gamma_{total}$ Γ_{49}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0011	90	[99] ALEXANDER	93B	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.0023	90	[100] ALBRECHT	93E	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

[99] ALEXANDER 93B reports $< 10.9 \times 10^{-4}$ for $B(D_s^+ \rightarrow \phi\pi^+) = 0.037$. We rescale to our best value $B(D_s^+ \rightarrow \phi\pi^+) = 0.036$.

[100] ALBRECHT 93E reports $< 3.1 \times 10^{-3}$ for $B(D_s^+ \rightarrow \phi\pi^+) = 0.027$. We rescale to our best value $B(D_s^+ \rightarrow \phi\pi^+) = 0.036$.

$\Gamma(D_s^+ \overline{K}^*(892)^0)/\Gamma_{total}$ Γ_{50}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0005	90	[101] ALEXANDER	93B	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

[101] ALEXANDER 93B reports $< 4.4 \times 10^{-4}$ for $B(D_s^+ \rightarrow \phi\pi^+) = 0.037$. We rescale to our best value $B(D_s^+ \rightarrow \phi\pi^+) = 0.036$.

$\Gamma(D_s^{*+} \overline{K}^*(892)^0)/\Gamma_{total}$ Γ_{51}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0004	90	[102] ALEXANDER	93B	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

[102] ALEXANDER 93B reports $< 4.3 \times 10^{-4}$ for $B(D_s^+ \rightarrow \phi\pi^+) = 0.037$. We rescale to our best value $B(D_s^+ \rightarrow \phi\pi^+) = 0.036$.

$\Gamma(D_s^- \pi^+ K^+)/\Gamma_{total}$ Γ_{52}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0008	90	[103] ALBRECHT	93E	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

[103] ALBRECHT 93E reports $< 1.1 \times 10^{-3}$ for $B(D_s^+ \rightarrow \phi\pi^+) = 0.027$. We rescale to our best value $B(D_s^+ \rightarrow \phi\pi^+) = 0.036$.

$\Gamma(D_s^{*-} \pi^+ K^+)/\Gamma_{total}$ Γ_{53}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0012	90	[104] ALBRECHT	93E	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

[104] ALBRECHT 93E reports $< 1.6 \times 10^{-3}$ for $B(D_s^+ \rightarrow \phi\pi^+) = 0.027$. We rescale to our best value $B(D_s^+ \rightarrow \phi\pi^+) = 0.036$.

$\Gamma(D_s^- \pi^+ K^*(892)^+)/\Gamma_{total}$ Γ_{54}/Γ

VALUE	*CL%*	*DOCUMENT ID*	*TECN*	*COMMENT*
<0.006	90	[105] ALBRECHT 93E	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

[105] ALBRECHT 93E reports $< 8.6 \times 10^{-3}$ for B($D_s^+ \rightarrow \phi\pi^+$) = 0.027. We rescale to our best value B($D_s^+ \rightarrow \phi\pi^+$) = 0.036.

$\Gamma(D_s^{*-} \pi^+ K^*(892)^+)/\Gamma_{total}$ Γ_{55}/Γ

VALUE	*CL%*	*DOCUMENT ID*	*TECN*	*COMMENT*
<0.008	90	[106] ALBRECHT 93E	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

[106] ALBRECHT 93E reports $< 1.1 \times 10^{-2}$ for B($D_s^+ \rightarrow \phi\pi^+$) = 0.027. We rescale to our best value B($D_s^+ \rightarrow \phi\pi^+$) = 0.036.