$B^{\pm}$

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

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

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

$B^{\pm}$ MASS

These experiments actually measure the difference between half of E_{cm} and the B mass.

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
5278.7±2.0 OUR FIT					
5278.7±2.0 OUR AVERAGE					
5278.8±0.54±2.0	362	[1] ALAM	94	CLE2	$e^+e^- \to \Upsilon(4S)$
5278.3±0.4 ±2.0		[1] BORTOLETTO	92	CLEO	$e^+e^- \to \Upsilon(4S)$
5280.5±1.0 ±2.0		[1,2] ALBRECHT	90J	ARG	$e^+e^- \to \Upsilon(4S)$
5278.6±0.8 ±2.0		[1] 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	[3] ALBRECHT	87D	ARG	$e^+e^- \to \Upsilon(4S)$

[1] 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.
[2] ALBRECHT 90J assumes 10580 for $\Upsilon(4S)$ mass. Supersedes ALBRECHT 87C and ALBRECHT 87D.
[3] 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.

VALUE (10^{-12} s)	EVTS	DOCUMENT ID		TECN	COMMENT
1.54±0.11 OUR AVERAGE					
1.61±0.16±0.05	148	[4] ABE	94D	CDF	$p\overline{p}$ at 1.8 TeV
$1.30^{+0.33}_{-0.29}\pm0.16$	92	[5] ABREU	93D	DLPH	$e^+e^- \to Z$
1.56±0.19±0.13	134	[6] ABREU	93G	DLPH	$e^+e^- \to Z$
$1.51^{+0.30}_{-0.28}{}^{+0.12}_{-0.14}$	59	[5] ACTON	93C	OPAL	$e^+e^- \to Z$
$1.47^{+0.22}_{-0.19}{}^{+0.15}_{-0.14}$	77	[5] BUSKULIC	93D	ALEP	$e^+e^- \to Z$

[4] ABE 94D measured mean life using fully reconstructed decays.
[5] Data analyzed using $D/D^*\ell$anything event vertices.
[6] ABREU 93G data analyzed using charged and neutral vertices.

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 modes

Γ_1	$\ell^+ \nu_\ell$ anything	[a]	(10.1 ± 2.3) %		
Γ_2	$\overline{D}^0 \ell^+ \nu_\ell$	[a]	(1.6 ± 0.7) %		
Γ_3	$\overline{D}^*(2007)^0 \ell^+ \nu_\ell$	[a]	(6.6 ± 2.2) %		
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	$\omega \mu^+ \nu_\mu$		seen		
Γ_7	$\rho^0 \ell^+ \nu_\ell$	[a]	< 2.1	$\times 10^{-4}$	CL=90%

D, D^*, or D_s modes

Γ_8	$\overline{D}^0 \pi^+$	(5.3 ± 0.5)	$\times 10^{-3}$	
Γ_9	$\overline{D}^0 \rho^+$	(1.34 ± 0.18)	%	
Γ_{10}	$\overline{D}^0 \pi^+ \pi^+ \pi^-$	(1.1 ± 0.4)	%	
Γ_{11}	$\overline{D}^0 \pi^+ \pi^+ \pi^-$ nonresonant	(5 ± 4)	$\times 10^{-3}$	
Γ_{12}	$\overline{D}^0 \pi^+ \rho^0$	(4.2 ± 3.0)	$\times 10^{-3}$	
Γ_{13}	$\overline{D}^0 a_1(1260)^+$	(5 ± 4)	$\times 10^{-3}$	
Γ_{14}	$D^*(2010)^- \pi^+ \pi^+$	(2.1 ± 0.6)	$\times 10^{-3}$	
Γ_{15}	$D^- \pi^+ \pi^+$	< 1.4	$\times 10^{-3}$	CL=90%
Γ_{16}	$\overline{D}^*(2007)^0 \pi^+$	(5.2 ± 0.8)	$\times 10^{-3}$	
Γ_{17}	$\overline{D}^*(2007)^0 \rho^+$	(1.55 ± 0.31)	%	
Γ_{18}	$\overline{D}^*(2007)^0 \pi^+ \pi^+ \pi^-$	(9.4 ± 2.6)	$\times 10^{-3}$	
Γ_{19}	$\overline{D}^*(2007)^0 a_1(1260)^+$	(1.9 ± 0.5)	%	
Γ_{20}	$D^*(2010)^- \pi^+ \pi^+ \pi^0$	(1.5 ± 0.7)	%	
Γ_{21}	$D^*(2010)^- \pi^+ \pi^+ \pi^+ \pi^-$	< 1	%	CL=90%
Γ_{22}	$\overline{D}_1^*(2420)^0 \pi^+$	(1.5 ± 0.6)	$\times 10^{-3}$	S=1.3
Γ_{23}	$\overline{D}_1^*(2420)^0 \rho^+$	< 1.4	$\times 10^{-3}$	CL=90%
Γ_{24}	$\overline{D}_2^*(2460)^0 \pi^+$	< 1.3	$\times 10^{-3}$	CL=90%
Γ_{25}	$\overline{D}_2^*(2460)^0 \rho^+$	< 4.7	$\times 10^{-3}$	CL=90%
Γ_{26}	$\overline{D}^0 D_s^+$	(1.7 ± 0.6)	%	
Γ_{27}	$\overline{D}^0 D_s^{*+}$	(1.2 ± 1.0)	%	
Γ_{28}	$\overline{D}^*(2007)^0 D_s^+$	(1.0 ± 0.7)	%	
Γ_{29}	$\overline{D}^*(2007)^0 D_s^{*+}$	(2.4 ± 1.3)	%	
Γ_{30}	$D_s^+ \pi^0$	< 2.1	$\times 10^{-4}$	CL=90%
Γ_{31}	$D_s^{*+} \pi^0$	< 3.4	$\times 10^{-4}$	CL=90%
Γ_{32}	$D_s^+ \eta$	< 5	$\times 10^{-4}$	CL=90%
Γ_{33}	$D_s^{*+} \eta$	< 8	$\times 10^{-4}$	CL=90%
Γ_{34}	$D_s^+ \rho^0$	< 4	$\times 10^{-4}$	CL=90%
Γ_{35}	$D_s^{*+} \rho^0$	< 5	$\times 10^{-4}$	CL=90%
Γ_{36}	$D_s^+ \omega$	< 5	$\times 10^{-4}$	CL=90%
Γ_{37}	$D_s^{*+} \omega$	< 7	$\times 10^{-4}$	CL=90%
Γ_{38}	$D_s^+ a_1(1260)^0$	< 2.3	$\times 10^{-3}$	CL=90%
Γ_{39}	$D_s^{*+} a_1(1260)^0$	< 1.7	$\times 10^{-3}$	CL=90%
Γ_{40}	$D_s^+ \phi$	< 3.3	$\times 10^{-4}$	CL=90%
Γ_{41}	$D_s^{*+} \phi$	< 4	$\times 10^{-4}$	CL=90%
Γ_{42}	$D_s^+ \overline{K}^0$	< 1.1	$\times 10^{-3}$	CL=90%
Γ_{43}	$D_s^{*+} \overline{K}^0$	< 1.2	$\times 10^{-3}$	CL=90%
Γ_{44}	$D_s^+ \overline{K}^*(892)^0$	< 5	$\times 10^{-4}$	CL=90%
Γ_{45}	$D_s^{*+} \overline{K}^*(892)^0$	< 5	$\times 10^{-4}$	CL=90%
Γ_{46}	$D_s^- \pi^+ K^+$	< 9	$\times 10^{-4}$	CL=90%
Γ_{47}	$D_s^{*-} \pi^+ K^+$	< 1.2	$\times 10^{-3}$	CL=90%
Γ_{48}	$D_s^- \pi^+ K^*(892)^+$	< 7	$\times 10^{-3}$	CL=90%
Γ_{49}	$D_s^{*-} \pi^+ K^*(892)^+$	< 9	$\times 10^{-3}$	CL=90%

Charmonium modes

Γ_{50}	$J/\psi(1S) K^+$	(1.02 ± 0.14)	$\times 10^{-3}$	
Γ_{51}	$J/\psi(1S) K^+ \pi^+ \pi^-$	(1.4 ± 0.6)	$\times 10^{-3}$	
Γ_{52}	$J/\psi(1S) K^*(892)^+$	(1.7 ± 0.5)	$\times 10^{-3}$	
Γ_{53}	$\psi(2S) K^+$	(6.9 ± 3.1)	$\times 10^{-4}$	S=1.3
Γ_{54}	$\psi(2S) K^*(892)^+$	< 3.0	$\times 10^{-3}$	CL=90%
Γ_{55}	$\psi(2S) K^*(892)^+ \pi^+ \pi^-$	(1.9 ± 1.2)	$\times 10^{-3}$	
Γ_{56}	$\chi_{c1}(1P) K^+$	(1.0 ± 0.4)	$\times 10^{-3}$	
Γ_{57}	$\chi_{c1}(1P) K^*(892)^+$	< 2.1	$\times 10^{-3}$	CL=90%

K or K^* modes

Γ_{58}	$K^0 \pi^+$	< 1.0	$\times 10^{-4}$	CL=90%
Γ_{59}	$K^*(892)^0 \pi^+$	< 1.5	$\times 10^{-4}$	CL=90%
Γ_{60}	$K^+ \pi^- \pi^+$ (no charm)	< 1.9	$\times 10^{-4}$	CL=90%
Γ_{61}	$K_1(1400)^0 \pi^+$	< 2.6	$\times 10^{-3}$	CL=90%
Γ_{62}	$K_2^*(1430)^0 \pi^+$	< 6.8	$\times 10^{-4}$	CL=90%
Γ_{63}	$K^+ \rho^0$	< 8	$\times 10^{-5}$	CL=90%
Γ_{64}	$K^*(892)^+ \pi^+ \pi^-$	< 1.1	$\times 10^{-3}$	CL=90%
Γ_{65}	$K^*(892)^+ \rho^0$	< 9.0	$\times 10^{-4}$	CL=90%
Γ_{66}	$K_1(1400)^+ \rho^0$	< 7.8	$\times 10^{-4}$	CL=90%
Γ_{67}	$K_2^*(1430)^+ \rho^0$	< 1.5	$\times 10^{-3}$	CL=90%
Γ_{68}	$K^+ K^- K^+$	< 3.5	$\times 10^{-4}$	CL=90%
Γ_{69}	$K^+ \phi$	< 9	$\times 10^{-5}$	CL=90%
Γ_{70}	$K^*(892)^+ K^+ K^-$	< 1.6	$\times 10^{-3}$	CL=90%
Γ_{71}	$K^*(892)^+ \phi$	< 1.3	$\times 10^{-3}$	CL=90%
Γ_{72}	$K_1(1400)^+ \phi$	< 1.1	$\times 10^{-3}$	CL=90%
Γ_{73}	$K_2^*(1430)^+ \phi$	< 3.4	$\times 10^{-3}$	CL=90%
Γ_{74}	$K^+ f_0(980)$	< 8	$\times 10^{-5}$	CL=90%
Γ_{75}	$K^*(892)^+ \gamma$	(5.7 ± 3.3)	$\times 10^{-5}$	
Γ_{76}	$K_1(1270)^+ \gamma$	< 7.3	$\times 10^{-3}$	CL=90%
Γ_{77}	$K_1(1400)^+ \gamma$	< 2.2	$\times 10^{-3}$	CL=90%
Γ_{78}	$K_2^*(1430)^+ \gamma$	< 1.4	$\times 10^{-3}$	CL=90%
Γ_{79}	$K^*(1680)^+ \gamma$	< 1.9	$\times 10^{-3}$	CL=90%
Γ_{80}	$K_3^*(1780)^+ \gamma$	< 5.5	$\times 10^{-3}$	CL=90%
Γ_{81}	$K_4^*(2045)^+ \gamma$	< 9.9	$\times 10^{-3}$	CL=90%

Light unflavored meson modes

Γ_{82}	$\pi^+ \pi^0$	< 2.4	$\times 10^{-4}$	CL=90%
Γ_{83}	$\pi^+ \pi^+ \pi^-$	< 1.9	$\times 10^{-4}$	CL=90%
Γ_{84}	$\rho^0 \pi^+$	< 1.5	$\times 10^{-4}$	CL=90%
Γ_{85}	$\pi^+ f_0(980)$	< 1.4	$\times 10^{-4}$	CL=90%
Γ_{86}	$\pi^+ f_2(1270)$	< 2.4	$\times 10^{-4}$	CL=90%
Γ_{87}	$\pi^+ \pi^0 \pi^0$	< 8.9	$\times 10^{-4}$	CL=90%
Γ_{88}	$\rho^+ \pi^0$	< 5.5	$\times 10^{-4}$	CL=90%
Γ_{89}	$\pi^+ \pi^- \pi^+ \pi^0$	< 4.0	$\times 10^{-3}$	CL=90%
Γ_{90}	$\rho^+ \rho^0$	< 1.0	$\times 10^{-3}$	CL=90%
Γ_{91}	$a_1(1260)^+ \pi^0$	< 1.7	$\times 10^{-3}$	CL=90%
Γ_{92}	$a_1(1260)^0 \pi^+$	< 9.0	$\times 10^{-4}$	CL=90%
Γ_{93}	$\omega \pi^+$	< 4.0	$\times 10^{-4}$	CL=90%
Γ_{94}	$\eta \pi^+$	< 7.0	$\times 10^{-4}$	CL=90%
Γ_{95}	$\pi^+ \pi^+ \pi^+ \pi^- \pi^-$	< 8.6	$\times 10^{-4}$	CL=90%
Γ_{96}	$\rho^0 a_1(1260)^+$	< 6.2	$\times 10^{-4}$	CL=90%
Γ_{97}	$\rho^0 a_2(1320)^+$	< 7.2	$\times 10^{-4}$	CL=90%
Γ_{98}	$\pi^+ \pi^+ \pi^+ \pi^- \pi^- \pi^0$	< 6.3	$\times 10^{-3}$	CL=90%
Γ_{99}	$a_1(1260)^+ a_1(1260)^0$	< 1.3	%	CL=90%

Baryon modes

Γ_{100}	$p\overline{p}\pi^+$		$<$ 1.6	$\times 10^{-4}$	CL=90%
Γ_{101}	$p\overline{p}\pi^+\pi^+\pi^-$		$<$ 5.2	$\times 10^{-4}$	CL=90%
Γ_{102}	$p\overline{\Lambda}$		$<$ 6	$\times 10^{-5}$	CL=90%
Γ_{103}	$p\overline{\Lambda}\pi^+\pi^-$		$<$ 2.0	$\times 10^{-4}$	CL=90%
Γ_{104}	$\overline{\Delta}^0 p$		$<$ 3.8	$\times 10^{-4}$	CL=90%
Γ_{105}	$\Delta^{++}\overline{p}$		$<$ 1.5	$\times 10^{-4}$	CL=90%

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

Γ_{106}	$\pi^+e^+e^-$	$B1$	$<$ 3.9	$\times 10^{-3}$	CL=90%
Γ_{107}	$\pi^+\mu^+\mu^-$	$B1$	$<$ 9.1	$\times 10^{-3}$	CL=90%
Γ_{108}	$K^+e^+e^-$	$B1$	$<$ 6	$\times 10^{-5}$	CL=90%
Γ_{109}	$K^+\mu^+\mu^-$	$B1$	$<$ 1.7	$\times 10^{-4}$	CL=90%
Γ_{110}	$K^*(892)^+e^+e^-$	$B1$	$<$ 6.9	$\times 10^{-4}$	CL=90%
Γ_{111}	$K^*(892)^+\mu^+\mu^-$	$B1$	$<$ 1.2	$\times 10^{-3}$	CL=90%
Γ_{112}	$\pi^+e^+\mu^-$	LF	$<$ 6.4	$\times 10^{-3}$	CL=90%
Γ_{113}	$\pi^+e^-\mu^+$	LF	$<$ 6.4	$\times 10^{-3}$	CL=90%
Γ_{114}	$K^+e^+\mu^-$	LF	$<$ 6.4	$\times 10^{-3}$	CL=90%
Γ_{115}	$K^+e^-\mu^+$	LF	$<$ 6.4	$\times 10^{-3}$	CL=90%
Γ_{116}	$\pi^-e^+e^+$	L	$<$ 3.9	$\times 10^{-3}$	CL=90%
Γ_{117}	$\pi^-\mu^+\mu^+$	L	$<$ 9.1	$\times 10^{-3}$	CL=90%
Γ_{118}	$\pi^-e^+\mu^+$	L	$<$ 6.4	$\times 10^{-3}$	CL=90%
Γ_{119}	$K^-e^+e^+$	L	$<$ 3.9	$\times 10^{-3}$	CL=90%
Γ_{120}	$K^-\mu^+\mu^+$	L	$<$ 9.1	$\times 10^{-3}$	CL=90%
Γ_{121}	$K^-e^+\mu^+$	L	$<$ 6.4	$\times 10^{-3}$	CL=90%

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

B^+ BRANCHING RATIOS

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

VALUE	DOCUMENT ID		TECN	COMMENT
0.101±0.018±0.015	ATHANAS	94	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

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

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

VALUE	DOCUMENT ID		TECN	COMMENT
0.016±0.006±0.003	[7] FULTON	91	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

[7] 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
0.066±0.016±0.015		[8] ALBRECHT	92C	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
seen	398	[9] SANGHERA	93	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
$0.041\pm0.008^{+0.008}_{-0.009}$		[10] FULTON	91	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
0.070±0.018±0.014		[11] ANTREASYAN	90B	CBAL	$e^+e^- \rightarrow \Upsilon(4S)$

[8] ALBRECHT 92C reports $0.058\pm0.014\pm0.013$. 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 $\Upsilon(4S)$.

[9] 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.

[10] Assumes equal production of $B^0\overline{B}^0$ and B^+B^- at the $\Upsilon(4S)$. Uncorrected for D and D^* branching ratio assumptions.

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

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

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

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

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<2.1 × 10^{-4}	90	[12] BEAN	93B	CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$

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

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

VALUE	DOCUMENT ID		TECN
seen	[13] ALBRECHT	91C	ARG

[13] In ALBRECHT 91C, one event is fully reconstructed providing evidence for the $b \rightarrow u$ 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 × 10^{-4}	90	[14] BEAN	93B	CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$

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

$\Gamma(\overline{D}^0 \pi^+)/\Gamma_{total}$ — Γ_8/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.0053±0.0005 OUR AVERAGE					
0.0055±0.0004±0.0005	304	[15] ALAM	94	CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$
0.0050±0.0007±0.0006	54	[16] BORTOLETTO	92	CLEO	$e^+ e^- \rightarrow \Upsilon(4S)$
$0.0054^{+0.0018+0.0012}_{-0.0015-0.0009}$	14	[17] BEBEK	87	CLEO	$e^+ e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.0020±0.0008±0.0006	12	[16] ALBRECHT	90J	ARG	$e^+ e^- \rightarrow \Upsilon(4S)$
0.0019±0.0010±0.0006	7	[18] ALBRECHT	88K	ARG	$e^+ e^- \rightarrow \Upsilon(4S)$

[15] 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 $B(D^0 \rightarrow K^- \pi^+ \pi^+ \pi^-)/B(D^0 \rightarrow K^- \pi^+)$.

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

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

[18] 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_9/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.0134±0.0018 OUR AVERAGE					
0.0135±0.0012±0.0015	212	[19] ALAM	94	CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$
0.013 ±0.004 ±0.004	19	[20] 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	[21] ALBRECHT	88K	ARG	$e^+ e^- \rightarrow \Upsilon(4S)$

[19] 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 $B(D^0 \rightarrow K^- \pi^+ \pi^+ \pi^-)/B(D^0 \rightarrow K^- \pi^+)$.

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

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

$\Gamma(\overline{D}^0 \pi^+ \pi^+ \pi^-)/\Gamma_{total}$ — Γ_{10}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
0.0115±0.0029±0.0021	[22] BORTOLETTO	92	CLEO	$e^+ e^- \rightarrow \Upsilon(4S)$

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

$\Gamma(\overline{D}^0 \pi^+ \pi^+ \pi^-$ nonresonant$)/\Gamma_{total}$ — Γ_{11}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
0.0051±0.0034±0.0023	[23] BORTOLETTO	92	CLEO	$e^+ e^- \rightarrow \Upsilon(4S)$

[23] 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_{12}/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
0.0042±0.0023±0.0020	[24] BORTOLETTO92	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

[24] 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_{13}/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
0.0045±0.0019±0.0031	[25] BORTOLETTO92	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

[25] 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_{14}/Γ

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
0.0021±0.0006 OUR AVERAGE						
0.0019±0.0007±0.0003		14	[26] ALAM	94	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
0.0026±0.0014±0.0007		11	[27] ALBRECHT	90J	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
$0.0024^{+0.0017+0.0010}_{-0.0016-0.0006}$		3	[28] BEBEK	87	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<0.004	90		[29] BORTOLETTO	92	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
0.005 ±0.002 ±0.003		7	[30] ALBRECHT	87C	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

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

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

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

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

[30] 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.

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

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
<0.0014	90		[31] ALAM	94	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<0.007	90		[32] BORTOLETTO	92	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
$0.0025^{+0.0041+0.0024}_{-0.0023-0.0008}$		1	[33] BEBEK	87	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

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

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

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

$\Gamma(\overline{D}^*(2007)^0 \pi^+)/\Gamma_{total}$ Γ_{16}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.0052±0.0008 OUR AVERAGE					
0.0052±0.0007±0.0007	71	[34] ALAM	94	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
0.0072±0.0018±0.0016		[35] BORTOLETTO	92	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
0.0040±0.0014±0.0012	9	[35] ALBRECHT	90J	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.0027±0.0044		[36] BEBEK	87	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

[34] 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 $B(D^0 \to K^-\pi^+\pi^+\pi^-)/B(D^0 \to K^-\pi^+)$.

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

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

$\Gamma(\overline{D}^*(2007)^0\rho^+)/\Gamma_{total}$ — Γ_{17}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.0155±0.0031 OUR AVERAGE					
0.0168±0.0021±0.0028	86	[37] ALAM	94	CLE2	$e^+e^- \to \Upsilon(4S)$
0.010 ±0.006 ±0.004	7	[38] ALBRECHT	90J	ARG	$e^+e^- \to \Upsilon(4S)$

[37] 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.

[38] 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_{18}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.0094±0.0020±0.0017	48	[39,40] ALAM	94	CLE2	$e^+e^- \to \Upsilon(4S)$

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

[40] 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_{19}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
0.0188±0.0040±0.0034	[41,42] ALAM	94	CLE2	$e^+e^- \to \Upsilon(4S)$

[41] 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.

[42] 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_{20}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.0151±0.0070±0.0004	26	[43] ALBRECHT	90J	ARG	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.043 ±0.013 ±0.026	24	[44] ALBRECHT	87C	ARG	$e^+e^- \to \Upsilon(4S)$

[43] ALBRECHT 90J reports $0.018 \pm 0.007 \pm 0.005$ for $B(D^*(2010)^+ \to D^0\pi^+) = 0.57 \pm 0.06$. We rescale to our best value $B(D^*(2010)^+ \to D^0\pi^+) = (68.1 \pm 1.6) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$ and uses Mark III branching fractions for the D.

[44] 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.

$\Gamma(D^*(2010)^-\pi^+\pi^+\pi^+\pi^-)/\Gamma_{total}$ — Γ_{21}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.01	90	[45] ALBRECHT	90J	ARG	$e^+e^- \to \Upsilon(4S)$

[45] 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_{22}/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	[46] ALAM	94	CLE2	$e^+e^- \to \Upsilon(4S)$
0.0025±0.0007±0.0006		[47] ALBRECHT	94D	ARG	$e^+e^- \to \Upsilon(4S)$

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

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

$\Gamma(\overline{D}_1^*(2420)^0 \rho^+)/\Gamma_{total}$ — Γ_{23}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0014	90	[48] ALAM	94	CLE2	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma(\overline{D}_2^*(2460)^0 \pi^+)/\Gamma_{total}$ — Γ_{24}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0013	90	[49] ALAM	94	CLE2	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.0028	90	[50] ALAM	94	CLE2	$e^+e^- \to \Upsilon(4S)$
<0.0023	90	[51] ALBRECHT	94D	ARG	$e^+e^- \to \Upsilon(4S)$

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

[50] 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 $B(D_2^*(2460)^0 \to D^*(2010)^+\pi^-) = 20\%$.

[51] 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_{25}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0047	90	[52] ALAM	94	CLE2	$e^+e^- \to \Upsilon(4S)$
<0.005	90	[53] ALAM	94	CLE2	$e^+e^- \to \Upsilon(4S)$

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

[53] 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_{26}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.017±0.006 OUR AVERAGE					
0.019±0.010±0.002		[54] ALBRECHT	92G	ARG	$e^+e^- \to \Upsilon(4S)$
0.017±0.007±0.002	5	[55] BORTOLETTO	90	CLEO	$e^+e^- \to \Upsilon(4S)$

[54] 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 $B(D_s^+ \to \phi\pi^+) = (3.5 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes PDG 1990 D^0 branching ratios, e.g., $B(D^0 \to K^-\pi^+) = 3.71 \pm 0.25\%$.

[55] BORTOLETTO 90 reports 0.029 ± 0.013 for $B(D_s^+ \to \phi\pi^+) = 0.02$. We rescale to our best value $B(D_s^+ \to \phi\pi^+) = (3.5 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\overline{D}^0 D_s^{*+})/\Gamma_{total}$ — Γ_{27}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
0.012±0.010±0.001	[56] ALBRECHT	92G	ARG	$e^+e^- \to \Upsilon(4S)$

[56] 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 $B(D_s^+ \to \phi\pi^+) = (3.5 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes PDG 1990 D^0 branching ratios, e.g., $B(D^0 \to K^-\pi^+) = 3.71 \pm 0.25\%$.

*CITATION: L. Montanet et al., Physical Review D50, 1173 (1994) and 1995 off-year partial update for the 1996 edition (URL: http://pdg.lbl.gov/)

$\Gamma(\overline{D}^*(2007)^0 D_s^+)/\Gamma_{\text{total}}$ Γ_{28}/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
0.010±0.007±0.001	[57] ALBRECHT 92G	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

[57] 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 $B(D_s^+ \rightarrow \phi\pi^+) = (3.5 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes PDG 1990 D^0 and $D^*(2007)^0$ branching ratios, e.g., $B(D^0 \rightarrow K^-\pi^+) = 3.71 \pm 0.25\%$ and $B(D^*(2007)^0 \rightarrow D^0\pi^0) = 55 \pm 6\%$.

$\Gamma(\overline{D}^*(2007)^0 D_s^{*+})/\Gamma_{\text{total}}$ Γ_{29}/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
0.024±0.013±0.003	[58] ALBRECHT 92G	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

[58] 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 $B(D_s^+ \rightarrow \phi\pi^+) = (3.5 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes PDG 1990 D^0 and $D^*(2007)^0$ branching ratios, e.g., $B(D^0 \rightarrow K^-\pi^+) = 3.71 \pm 0.25\%$ and $B(D^*(2007)^0 \rightarrow D^0\pi^0) = 55 \pm 6\%$.

$\Gamma(D_s^+\pi^0)/\Gamma_{\text{total}}$ Γ_{30}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.00021	90	[59] ALEXANDER 93B	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

[59] ALEXANDER 93B reports $< 2.0 \times 10^{-4}$ for $B(D_s^+ \rightarrow \phi\pi^+) = 0.037$. We rescale to our best value $B(D_s^+ \rightarrow \phi\pi^+) = 0.035$.

$\left[\Gamma(D_s^+\pi^0) + \Gamma(D_s^{*+}\pi^0)\right]/\Gamma_{\text{total}}$ $(\Gamma_{30}+\Gamma_{31})/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0007	90	[60] ALBRECHT 93E	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

[60] ALBRECHT 93E reports $< 0.9 \times 10^{-3}$ for $B(D_s^+ \rightarrow \phi\pi^+) = 0.027$. We rescale to our best value $B(D_s^+ \rightarrow \phi\pi^+) = 0.035$.

$\Gamma(D_s^{*+}\pi^0)/\Gamma_{\text{total}}$ Γ_{31}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.00034	90	[61] ALEXANDER 93B	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

[61] ALEXANDER 93B reports $< 3.2 \times 10^{-4}$ for $B(D_s^+ \rightarrow \phi\pi^+) = 0.037$. We rescale to our best value $B(D_s^+ \rightarrow \phi\pi^+) = 0.035$.

$\Gamma(D_s^+\eta)/\Gamma_{\text{total}}$ Γ_{32}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0005	90	[62] ALEXANDER 93B	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

[62] ALEXANDER 93B reports $< 4.6 \times 10^{-4}$ for $B(D_s^+ \rightarrow \phi\pi^+) = 0.037$. We rescale to our best value $B(D_s^+ \rightarrow \phi\pi^+) = 0.035$.

$\Gamma(D_s^{*+}\eta)/\Gamma_{\text{total}}$ Γ_{33}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0008	90	[63] ALEXANDER 93B	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

[63] ALEXANDER 93B reports $< 7.5 \times 10^{-4}$ for $B(D_s^+ \rightarrow \phi\pi^+) = 0.037$. We rescale to our best value $B(D_s^+ \rightarrow \phi\pi^+) = 0.035$.

$\Gamma(D_s^+\rho^0)/\Gamma_{\text{total}}$ Γ_{34}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0004	90	[64] ALEXANDER 93B	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

[64] ALEXANDER 93B reports $< 3.7 \times 10^{-4}$ for $B(D_s^+ \rightarrow \phi\pi^+) = 0.037$. We rescale to our best value $B(D_s^+ \rightarrow \phi\pi^+) = 0.035$.

$\left[\Gamma(D_s^+\rho^0) + \Gamma(D_s^+\overline{K}^*(892)^0)\right]/\Gamma_{\text{total}}$ $(\Gamma_{34}+\Gamma_{44})/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0026	90	[65] ALBRECHT 93E	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

[65] ALBRECHT 93E reports $< 3.4 \times 10^{-3}$ for $B(D_s^+ \rightarrow \phi\pi^+) = 0.027$. We rescale to our best value $B(D_s^+ \rightarrow \phi\pi^+) = 0.035$.

$\Gamma(D_s^{*+}\rho^0)/\Gamma_{\text{total}}$ Γ_{35}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0005	90	[66] ALEXANDER 93B	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

[66] ALEXANDER 93B reports $< 4.8 \times 10^{-4}$ for B($D_s^+ \rightarrow \phi\pi^+$) = 0.037. We rescale to our best value B($D_s^+ \rightarrow \phi\pi^+$) = 0.035.

$[\Gamma(D_s^{*+}\rho^0) + \Gamma(D_s^{*+}\overline{K}^*(892)^0)]/\Gamma_{\text{total}}$ $(\Gamma_{35}+\Gamma_{45})/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0015	90	[67] ALBRECHT 93E	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

[67] ALBRECHT 93E reports $< 2.0 \times 10^{-3}$ for B($D_s^+ \rightarrow \phi\pi^+$) = 0.027. We rescale to our best value B($D_s^+ \rightarrow \phi\pi^+$) = 0.035.

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

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0005	90	[68] ALEXANDER 93B	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<0.0026	90	[69] ALBRECHT 93E	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

[68] ALEXANDER 93B reports $< 4.8 \times 10^{-4}$ for B($D_s^+ \rightarrow \phi\pi^+$) = 0.037. We rescale to our best value B($D_s^+ \rightarrow \phi\pi^+$) = 0.035.

[69] ALBRECHT 93E reports $< 3.4 \times 10^{-3}$ for B($D_s^+ \rightarrow \phi\pi^+$) = 0.027. We rescale to our best value B($D_s^+ \rightarrow \phi\pi^+$) = 0.035.

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

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0007	90	[70] ALEXANDER 93B	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<0.0015	90	[71] ALBRECHT 93E	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

[70] ALEXANDER 93B reports $< 6.8 \times 10^{-4}$ for B($D_s^+ \rightarrow \phi\pi^+$) = 0.037. We rescale to our best value B($D_s^+ \rightarrow \phi\pi^+$) = 0.035.

[71] ALBRECHT 93E reports $< 1.9 \times 10^{-3}$ for B($D_s^+ \rightarrow \phi\pi^+$) = 0.027. We rescale to our best value B($D_s^+ \rightarrow \phi\pi^+$) = 0.035.

$\Gamma(D_s^+ a_1(1260)^0)/\Gamma_{\text{total}}$ Γ_{38}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0023	90	[72] ALBRECHT 93E	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

[72] ALBRECHT 93E reports $< 3.0 \times 10^{-3}$ for B($D_s^+ \rightarrow \phi\pi^+$) = 0.027. We rescale to our best value B($D_s^+ \rightarrow \phi\pi^+$) = 0.035.

$\Gamma(D_s^{*+} a_1(1260)^0)/\Gamma_{\text{total}}$ Γ_{39}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0017	90	[73] ALBRECHT 93E	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

[73] ALBRECHT 93E reports $< 2.2 \times 10^{-3}$ for B($D_s^+ \rightarrow \phi\pi^+$) = 0.027. We rescale to our best value B($D_s^+ \rightarrow \phi\pi^+$) = 0.035.

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

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.00033	90	[74] ALEXANDER 93B	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<0.0013	90	[75] ALBRECHT 93E	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

[74] ALEXANDER 93B reports $< 3.1 \times 10^{-4}$ for B($D_s^+ \rightarrow \phi\pi^+$) = 0.037. We rescale to our best value B($D_s^+ \rightarrow \phi\pi^+$) = 0.035.

[75] ALBRECHT 93E reports $< 1.7 \times 10^{-3}$ for B($D_s^+ \rightarrow \phi\pi^+$) = 0.027. We rescale to our best value B($D_s^+ \rightarrow \phi\pi^+$) = 0.035.

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

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0004	90	[76] ALEXANDER 93B	CLE2	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<0.0016	90	[77] ALBRECHT 93E	ARG	$e^+e^- \to \Upsilon(4S)$

[76] ALEXANDER 93B reports $< 4.2 \times 10^{-4}$ for $B(D_s^+ \to \phi\pi^+) = 0.037$. We rescale to our best value $B(D_s^+ \to \phi\pi^+) = 0.035$.

[77] ALBRECHT 93E reports $< 2.1 \times 10^{-3}$ for $B(D_s^+ \to \phi\pi^+) = 0.027$. We rescale to our best value $B(D_s^+ \to \phi\pi^+) = 0.035$.

$\Gamma(D_s^+\overline{K}^0)/\Gamma_{total}$ Γ_{42}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0011	90	[78] ALEXANDER 93B	CLE2	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<0.0019	90	[79] ALBRECHT 93E	ARG	$e^+e^- \to \Upsilon(4S)$

[78] ALEXANDER 93B reports $< 10.3 \times 10^{-4}$ for $B(D_s^+ \to \phi\pi^+) = 0.037$. We rescale to our best value $B(D_s^+ \to \phi\pi^+) = 0.035$.

[79] ALBRECHT 93E reports $< 2.5 \times 10^{-3}$ for $B(D_s^+ \to \phi\pi^+) = 0.027$. We rescale to our best value $B(D_s^+ \to \phi\pi^+) = 0.035$.

$\Gamma(D_s^{*+}\overline{K}^0)/\Gamma_{total}$ Γ_{43}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0012	90	[80] ALEXANDER 93B	CLE2	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<0.0024	90	[81] ALBRECHT 93E	ARG	$e^+e^- \to \Upsilon(4S)$

[80] ALEXANDER 93B reports $< 10.9 \times 10^{-4}$ for $B(D_s^+ \to \phi\pi^+) = 0.037$. We rescale to our best value $B(D_s^+ \to \phi\pi^+) = 0.035$.

[81] ALBRECHT 93E reports $< 3.1 \times 10^{-3}$ for $B(D_s^+ \to \phi\pi^+) = 0.027$. We rescale to our best value $B(D_s^+ \to \phi\pi^+) = 0.035$.

$\Gamma(D_s^+\overline{K}^*(892)^0)/\Gamma_{total}$ Γ_{44}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0005	90	[82] ALEXANDER 93B	CLE2	$e^+e^- \to \Upsilon(4S)$

[82] ALEXANDER 93B reports $< 4.4 \times 10^{-4}$ for $B(D_s^+ \to \phi\pi^+) = 0.037$. We rescale to our best value $B(D_s^+ \to \phi\pi^+) = 0.035$.

$\Gamma(D_s^{*+}\overline{K}^*(892)^0)/\Gamma_{total}$ Γ_{45}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0005	90	[83] ALEXANDER 93B	CLE2	$e^+e^- \to \Upsilon(4S)$

[83] ALEXANDER 93B reports $< 4.3 \times 10^{-4}$ for $B(D_s^+ \to \phi\pi^+) = 0.037$. We rescale to our best value $B(D_s^+ \to \phi\pi^+) = 0.035$.

$\Gamma(D_s^-\pi^+K^+)/\Gamma_{total}$ Γ_{46}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0009	90	[84] ALBRECHT 93E	ARG	$e^+e^- \to \Upsilon(4S)$

[84] ALBRECHT 93E reports $< 1.1 \times 10^{-3}$ for $B(D_s^+ \to \phi\pi^+) = 0.027$. We rescale to our best value $B(D_s^+ \to \phi\pi^+) = 0.035$.

$\Gamma(D_s^{*-}\pi^+K^+)/\Gamma_{total}$ Γ_{47}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0012	90	[85] ALBRECHT 93E	ARG	$e^+e^- \to \Upsilon(4S)$

[85] ALBRECHT 93E reports $< 1.6 \times 10^{-3}$ for $B(D_s^+ \to \phi\pi^+) = 0.027$. We rescale to our best value $B(D_s^+ \to \phi\pi^+) = 0.035$.

$\Gamma(D_s^- \pi^+ K^*(892)^+)/\Gamma_{total}$ Γ_{48}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.007	90	[86] ALBRECHT 93E	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

[86] ALBRECHT 93E reports $< 8.6 \times 10^{-3}$ for $B(D_s^+ \rightarrow \phi\pi^+) = 0.027$. We rescale to our best value $B(D_s^+ \rightarrow \phi\pi^+) = 0.035$.

$\Gamma(D_s^{*-} \pi^+ K^*(892)^+)/\Gamma_{total}$ Γ_{49}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.009	90	[87] ALBRECHT 93E	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

[87] ALBRECHT 93E reports $< 1.1 \times 10^{-2}$ for $B(D_s^+ \rightarrow \phi\pi^+) = 0.027$. We rescale to our best value $B(D_s^+ \rightarrow \phi\pi^+) = 0.035$.

$\Gamma(J/\psi(1S)K^+)/\Gamma_{total}$ Γ_{50}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
10.2 ± 1.4 OUR AVERAGE				
11.0 ± 1.5 ±0.9	59	[88] ALAM 94	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
9.22± 3.03±0.39		[89] BORTOLETTO 92	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
8.1 ± 3.5 ±0.3	6	[90] ALBRECHT 90J	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
22 ±10 ±2		BUSKULIC 92G	ALEP	$e^+e^- \rightarrow Z$
7 ± 4	3	[91] ALBRECHT 87D	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
10 ± 7 ±2	3	[92] BEBEK 87	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
9 ± 5	3	[93] ALAM 86	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

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

[89] BORTOLETTO 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 $B(J/\psi(1S) \rightarrow e^+e^-) = (5.99 \pm 0.25) \times 10^{-2}$. 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 $\Upsilon(4S)$.

[90] 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 $B(J/\psi(1S) \rightarrow e^+e^-) = (5.99 \pm 0.25) \times 10^{-2}$. 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 $\Upsilon(4S)$.

[91] ALBRECHT 87D assume $B^+B^-/B^0\overline{B}^0$ ratio is 55/45. Superseded by ALBRECHT 90J.

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

[93] ALAM 86 assumes $B^\pm/B^0$ ratio is 60/40.

$\Gamma(J/\psi(1S)K^+\pi^+\pi^-)/\Gamma_{total}$ Γ_{51}/Γ

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
0.0014±0.0006 OUR AVERAGE					
0.0014±0.0008±0.0001			[94] BORTOLETTO 92	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
0.0014±0.0009±0.0001		6	[95] ALBRECHT 87D	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.0018	90		[96] ALBRECHT 90J	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

[94] 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 $B(J/\psi(1S) \rightarrow e^+e^-) = (5.99 \pm 0.25) \times 10^{-2}$. 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 $\Upsilon(4S)$.

[95] 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 $B(J/\psi(1S) \rightarrow e^+e^-) = (5.99 \pm 0.25) \times 10^{-2}$. 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 $B^+ \rightarrow \psi(2S)K^+$.

[96] ALBRECHT 90J reports < 0.0016 for $B(J/\psi(1S) \rightarrow e^+e^-) = 0.069$. We rescale to our best value $B(J/\psi(1S) \rightarrow e^+e^-) = 0.0599$. Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

$\Gamma(J/\psi(1S)K^*(892)^+)/\Gamma_{\text{total}}$ — Γ_{52}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.0017 ±0.0005 OUR AVERAGE					
0.00178±0.00051±0.00023	13	[97] ALAM	94	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
0.0015 ±0.0011 ±0.0001		[98] BORTOLETTO	92	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
0.0018 ±0.0013 ±0.0001	2	[99] ALBRECHT	90J	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
		[100] ALBRECHT	94G	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

[97] The neutral and charged B events together are predominantly longitudinally polarized, $\Gamma_L/\Gamma = 0.80 \pm 0.08 \pm 0.05$. This can be compared with a prediction, using HQET, of 0.73 (KRAMER 92). This polarization indicates that the $B \rightarrow \psi K^*$ decay is dominated by the $CP = -1$ CP eigenstate. Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

[98] BORTOLETTO 92 reports $0.0013 \pm 0.0009 \pm 0.0003$ for $\mathrm{B}(J/\psi(1S) \rightarrow e^+e^-) = 0.069 \pm 0.009$. We rescale to our best value $\mathrm{B}(J/\psi(1S) \rightarrow e^+e^-) = (5.99 \pm 0.25) \times 10^{-2}$. 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 $\Upsilon(4S)$.

[99] ALBRECHT 90J reports $0.0016 \pm 0.0011 \pm 0.0003$ for $\mathrm{B}(J/\psi(1S) \rightarrow e^+e^-) = 0.069 \pm 0.009$. We rescale to our best value $\mathrm{B}(J/\psi(1S) \rightarrow e^+e^-) = (5.99 \pm 0.25) \times 10^{-2}$. 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 $\Upsilon(4S)$.

[100] ALBRECHT 94G measures the polarization in the vector-vector decay to be predominantly longitudinal, $\Gamma_T/\Gamma = 0.03 \pm 0.16 \pm 0.15$ making the neutral decay a CP eigenstate when the K^{*0} decays through $K^0_S\pi^0$.

$\Gamma(\psi(2S)K^+)/\Gamma_{\text{total}}$ — Γ_{53}/Γ

VALUE (units 10^{-4})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
6.9± 3.1 OUR AVERAGE Error includes scale factor of 1.3.						
6.1± 2.3±0.9		7	[101] ALAM	94	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
18 ± 8 ±4		5	[101] ALBRECHT	90J	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
< 5	90		[101] BORTOLETTO	92	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
22 ±17		3	[102] ALBRECHT	87D	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

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

[102] ALBRECHT 87D assume $B^+B^-/B^0\overline{B}^0$ ratio is 55/45. Superseded by ALBRECHT 90J.

$\Gamma(\psi(2S)K^*(892)^+)/\Gamma_{\text{total}}$ — Γ_{54}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0030	90	[103] ALAM	94	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.0035	90	[103] BORTOLETTO	92	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
<0.0049	90	[103] ALBRECHT	90J	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

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

$\Gamma(\psi(2S)K^*(892)^+\pi^+\pi^-)/\Gamma_{\text{total}}$ — Γ_{55}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.0019±0.0011±0.0004	3	[104] ALBRECHT	90J	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

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

$\Gamma(\chi_{c1}(1P)K^+)/\Gamma_{\text{total}}$ — Γ_{56}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.0010 ±0.0004 OUR AVERAGE					
0.00097±0.00040±0.00009	6	[105] ALAM	94	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
0.0019 ±0.0013 ±0.0006		[106] ALBRECHT	92E	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

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

[106] ALBRECHT 92E assumes no $\chi_{c2}(1P)$ production and $\mathrm{B}(\Upsilon(4S) \rightarrow B^+B^-) = 50\%$.

$\Gamma(\chi_{c1}(1P)K^*(892)^+)/\Gamma_{\text{total}}$ — Γ_{57}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0021	90	[107] ALAM	94	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

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

$\Gamma(K^0\pi^+)/\Gamma_{total}$ — Γ_{58}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<1.0 × 10⁻⁴ → **$<1.0\times10^{-4}$**	90	[108] AVERY	89B	CLEO	$e^+e^-\to\Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<1.9\times10^{-4}$	90	ALBRECHT	91B	ARG	$e^+e^-\to\Upsilon(4S)$
$<6.8\times10^{-4}$	90	AVERY	87	CLEO	$e^+e^-\to\Upsilon(4S)$

[108] AVERY 89B reports $<9\times10^{-5}$ assuming the $\Upsilon(4S)$ decays 43% to $B^0\overline{B}^0$. We rescale to 50%.

$\Gamma(K^*(892)^0\pi^+)/\Gamma_{total}$ — Γ_{59}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<1.5\times10^{-4}$	90	[109] AVERY	89B	CLEO	$e^+e^-\to\Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<1.7\times10^{-4}$	90	ALBRECHT	91B	ARG	$e^+e^-\to\Upsilon(4S)$
$<2.6\times10^{-4}$	90	AVERY	87	CLEO	$e^+e^-\to\Upsilon(4S)$

[109] AVERY 89B reports $<1.3\times10^{-4}$ assuming the $\Upsilon(4S)$ decays 43% to $B^0\overline{B}^0$. We rescale to 50%.

$\Gamma(K^+\pi^-\pi^+(\text{no charm}))/\Gamma_{total}$ — Γ_{60}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<1.9\times10^{-4}$	90	[110] AVERY	89B	CLEO	$e^+e^-\to\Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<3.3\times10^{-4}$	90	ALBRECHT	91E	ARG	$e^+e^-\to\Upsilon(4S)$

[110] AVERY 89B reports $<1.7\times10^{-4}$ assuming the $\Upsilon(4S)$ decays 43% to $B^0\overline{B}^0$. We rescale to 50%.

$\Gamma(K_1(1400)^0\pi^+)/\Gamma_{total}$ — Γ_{61}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<2.6\times10^{-3}$	90	ALBRECHT	91B	ARG	$e^+e^-\to\Upsilon(4S)$

$\Gamma(K_2^*(1430)^0\pi^+)/\Gamma_{total}$ — Γ_{62}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<6.8\times10^{-4}$	90	ALBRECHT	91B	ARG	$e^+e^-\to\Upsilon(4S)$

$\Gamma(K^+\rho^0)/\Gamma_{total}$ — Γ_{63}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<8\times10^{-5}$	90	[111] AVERY	89B	CLEO	$e^+e^-\to\Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<1.8\times10^{-4}$	90	ALBRECHT	91B	ARG	$e^+e^-\to\Upsilon(4S)$
$<2.6\times10^{-4}$	90	AVERY	87	CLEO	$e^+e^-\to\Upsilon(4S)$

[111] AVERY 89B reports $<7\times10^{-5}$ assuming the $\Upsilon(4S)$ decays 43% to $B^0\overline{B}^0$. We rescale to 50%.

$\Gamma(K^*(892)^+\pi^+\pi^-)/\Gamma_{total}$ — Γ_{64}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<1.1\times10^{-3}$	90	ALBRECHT	91E	ARG	$e^+e^-\to\Upsilon(4S)$

$\Gamma(K^*(892)^+\rho^0)/\Gamma_{total}$ — Γ_{65}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<9.0\times10^{-4}$	90	ALBRECHT	91B	ARG	$e^+e^-\to\Upsilon(4S)$

$\Gamma(K_1(1400)^+\rho^0)/\Gamma_{total}$ — Γ_{66}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<7.8\times10^{-4}$	90	ALBRECHT	91B	ARG	$e^+e^-\to\Upsilon(4S)$

$\Gamma(K_2^*(1430)^+\rho^0)/\Gamma_{total}$ — Γ_{67}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<1.5\times10^{-3}$	90	ALBRECHT	91B	ARG	$e^+e^-\to\Upsilon(4S)$

$\Gamma(K^+K^-K^+)/\Gamma_{total}$ — Γ_{68}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<3.5\times10^{-4}$	90	ALBRECHT	91E	ARG	$e^+e^-\to\Upsilon(4S)$

$\Gamma(K^+\phi)/\Gamma_{total}$ — Γ_{69}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<9 $\times 10^{-5}$	90	[112] AVERY	89B	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<1.8 \times 10^{-4}$	90	ALBRECHT	91B	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
$<2.1 \times 10^{-4}$	90	AVERY	87	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

[112] AVERY 89B reports $< 8 \times 10^{-5}$ assuming the $\Upsilon(4S)$ decays 43% to $B^0\overline{B}^0$. We rescale to 50%.

$\Gamma(K^*(892)^+K^+K^-)/\Gamma_{total}$ — Γ_{70}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<1.6 $\times 10^{-3}$	90	ALBRECHT	91E	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

$\Gamma(K^*(892)^+\phi)/\Gamma_{total}$ — Γ_{71}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<1.3 $\times 10^{-3}$	90	ALBRECHT	91B	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

$\Gamma(K_1(1400)^+\phi)/\Gamma_{total}$ — Γ_{72}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<1.1 $\times 10^{-3}$	90	ALBRECHT	91B	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

$\Gamma(K_2^*(1430)^+\phi)/\Gamma_{total}$ — Γ_{73}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<3.4 $\times 10^{-3}$	90	ALBRECHT	91B	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

$\Gamma(K^+f_0(980))/\Gamma_{total}$ — Γ_{74}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<8 $\times 10^{-5}$	90	[113] AVERY	89B	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

[113] AVERY 89B reports $< 7 \times 10^{-5}$ assuming the $\Upsilon(4S)$ decays 43% to $B^0\overline{B}^0$. We rescale to 50%.

$\Gamma(K^*(892)^+\gamma)/\Gamma_{total}$ — Γ_{75}/Γ

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
(5.7±3.1±1.1) $\times 10^{-5}$		5	[114] AMMAR	93	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
$< 5.5 \times 10^{-4}$	90		[115] ALBRECHT	89G	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
$< 5.5 \times 10^{-4}$	90		[116] AVERY	89B	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
$< 1.8 \times 10^{-3}$	90		AVERY	87	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

[114] AMMAR 93 observed 4.1 ± 2.3 events above background.
[115] Assumes the $\Upsilon(4S)$ decays 45% to $B^0\overline{B}^0$.
[116] Assumes the $\Upsilon(4S)$ decays 43% to $B^0\overline{B}^0$.

$\Gamma(K_1(1270)^+\gamma)/\Gamma_{total}$ — Γ_{76}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0073	90	[117] ALBRECHT	89G	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

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

$\Gamma(K_1(1400)^+\gamma)/\Gamma_{total}$ — Γ_{77}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0022	90	[118] ALBRECHT	89G	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

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

$\Gamma(K_2^*(1430)^+\gamma)/\Gamma_{total}$ — Γ_{78}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0014	90	[119] ALBRECHT	89G	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

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

$\Gamma(K^*(1680)^+\gamma)/\Gamma_{total}$ — Γ_{79}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0019	90	[120] ALBRECHT 89G	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

[120] ALBRECHT 89G reports < 0.0017 assuming the $\Upsilon(4S)$ decays 45% to $B^0\overline{B}^0$. We rescale to 50%.

$\Gamma(K_3^*(1780)^+\gamma)/\Gamma_{total}$ — Γ_{80}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0055	90	[121] ALBRECHT 89G	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

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

$\Gamma(K_4^*(2045)^+\gamma)/\Gamma_{total}$ — Γ_{81}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0099	90	[122] ALBRECHT 89G	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

[122] ALBRECHT 89G reports < 0.0090 assuming the $\Upsilon(4S)$ decays 45% to $B^0\overline{B}^0$. We rescale to 50%.

$\Gamma(\pi^+\pi^0)/\Gamma_{total}$ — Γ_{82}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<2.4 \times 10^{-4}$	90	[123] ALBRECHT 90B	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$<2.3 \times 10^{-3}$	90	[124] BEBEK 87	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

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

$\Gamma(\pi^+\pi^+\pi^-)/\Gamma_{total}$ — Γ_{83}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<1.9 \times 10^{-4}$	90	[125] BORTOLETTO89	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$<4.5 \times 10^{-4}$	90	[126] ALBRECHT 90B	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

[125] BORTOLETTO 89 reports $< 1.7 \times 10^{-4}$ assuming the $\Upsilon(4S)$ decays 43% to $B^0\overline{B}^0$. We rescale to 50%.
[126] ALBRECHT 90B limit assumes equal production of $B^0\overline{B}^0$ and B^+B^- at $\Upsilon(4S)$.

$\Gamma(\rho^0\pi^+)/\Gamma_{total}$ — Γ_{84}/Γ

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$<1.5 \times 10^{-4}$	90		[127] ALBRECHT 90B	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<1.7 \times 10^{-4}$	90		[128] BORTOLETTO89	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
$<2.3 \times 10^{-4}$	90		[128] BEBEK 87	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
$<6 \times 10^{-4}$	90	0	GILES 84	CLEO	Repl. by BEBEK 87

[127] ALBRECHT 90B limit assumes equal production of $B^0\overline{B}^0$ and B^+B^- at $\Upsilon(4S)$.
[128] Papers assume the $\Upsilon(4S)$ decays 43% to $B^0\overline{B}^0$. We rescale to 50%.

$\Gamma(\pi^+f_0(980))/\Gamma_{total}$ — Γ_{85}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<1.4 \times 10^{-4}$	90	[129] BORTOLETTO89	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

[129] BORTOLETTO 89 reports $< 1.2 \times 10^{-4}$ assuming the $\Upsilon(4S)$ decays 43% to $B^0\overline{B}^0$. We rescale to 50%.

$\Gamma(\pi^+f_2(1270))/\Gamma_{total}$ — Γ_{86}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<2.4 \times 10^{-4}$	90	[130] BORTOLETTO89	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

[130] BORTOLETTO 89 reports $< 2.1 \times 10^{-4}$ assuming the $\Upsilon(4S)$ decays 43% to $B^0\overline{B}^0$. We rescale to 50%.

$\Gamma(\pi^+\pi^0\pi^0)/\Gamma_{total}$ — Γ_{87}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<8.9 \times 10^{-4}$	90	[131] ALBRECHT 90B	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

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

$\Gamma(\rho^+\pi^0)/\Gamma_{\rm total}$ — Γ_{88}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<5.5 × 10^{-4}	90	[132] ALBRECHT	90B	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

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

$\Gamma(\pi^+\pi^-\pi^+\pi^0)/\Gamma_{\rm total}$ — Γ_{89}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<4.0 × 10^{-3}	90	[133] ALBRECHT	90B	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

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

$\Gamma(\rho^+\rho^0)/\Gamma_{\rm total}$ — Γ_{90}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<1.0 × 10^{-3}	90	[134] ALBRECHT	90B	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

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

$\Gamma(a_1(1260)^+\pi^0)/\Gamma_{\rm total}$ — Γ_{91}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<1.7 × 10^{-3}	90	[135] ALBRECHT	90B	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

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

$\Gamma(a_1(1260)^0\pi^+)/\Gamma_{\rm total}$ — Γ_{92}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<9.0 × 10^{-4}	90	[136] ALBRECHT	90B	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

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

$\Gamma(\omega\pi^+)/\Gamma_{\rm total}$ — Γ_{93}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<4.0 × 10^{-4}	90	[137] ALBRECHT	90B	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

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

$\Gamma(\eta\pi^+)/\Gamma_{\rm total}$ — Γ_{94}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<7.0 × 10^{-4}	90	[138] ALBRECHT	90B	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

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

$\Gamma(\pi^+\pi^+\pi^+\pi^-\pi^-)/\Gamma_{\rm total}$ — Γ_{95}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<8.6 × 10^{-4}	90	[139] ALBRECHT	90B	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

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

$\Gamma(\rho^0 a_1(1260)^+)/\Gamma_{\rm total}$ — Γ_{96}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<6.2 × 10^{-4}	90	[140] BORTOLETTO	89	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<6.0 × 10^{-4}	90	[141] ALBRECHT	90B	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
<3.2 × 10^{-3}	90	[140] BEBEK	87	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

[140] BORTOLETTO 89 reports $< 5.4 \times 10^{-4}$ assuming the $\Upsilon(4S)$ decays 43% to $B^0\overline{B}^0$. We rescale to 50%.
[141] ALBRECHT 90B limit assumes equal production of $B^0\overline{B}^0$ and B^+B^- at $\Upsilon(4S)$.

$\Gamma(\rho^0 a_2(1320)^+)/\Gamma_{\rm total}$ — Γ_{97}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<7.2 × 10^{-4}	90	[142] BORTOLETTO	89	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<2.6 × 10^{-3}	90	[143] BEBEK	87	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

[142] BORTOLETTO 89 reports $< 6.3 \times 10^{-4}$ assuming the $\Upsilon(4S)$ decays 43% to $B^0\overline{B}^0$. We rescale to 50%.
[143] BEBEK 87reports $< 2.3 \times 10^{-3}$ assuming the $\Upsilon(4S)$ decays 43% to $B^0\overline{B}^0$. We rescale to 50%.

$\Gamma(\pi^+\pi^+\pi^+\pi^-\pi^-\pi^0)/\Gamma_{\rm total}$ — Γ_{98}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<6.3 × 10^{-3}	90	[144] ALBRECHT	90B	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

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

$\Gamma(a_1(1260)^+ a_1(1260)^0)/\Gamma_{total}$ — Γ_{99}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<1.3 × 10^{-2}	90	[145] ALBRECHT	90B	ARG	$e^+ e^- \rightarrow \Upsilon(4S)$

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

$\Gamma(p\overline{p}\pi^+)/\Gamma_{total}$ — Γ_{100}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
< 1.6 × 10^{-4}	90	[146] BEBEK	89	CLEO	$e^+ e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$(5.7\pm1.5\pm2.1) \times 10^{-4}$		[147] ALBRECHT	88F	ARG	$e^+ e^- \rightarrow \Upsilon(4S)$

[146] BEBEK 89 reports $< 1.4 \times 10^{-4}$ assuming the $\Upsilon(4S)$ decays 43% to $B^0 \overline{B}^0$. We rescale to 50%.
[147] ALBRECHT 88F reports $(5.2 \pm 1.4 \pm 1.9) \times 10^{-4}$ assuming the $\Upsilon(4S)$ decays 45% to $B^0 \overline{B}^0$. We rescale to 50%.

$\Gamma(p\overline{p}\pi^+\pi^+\pi^-)/\Gamma_{total}$ — Γ_{101}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<5.2 × 10^{-4}	90	[148] ALBRECHT	88F	ARG	$e^+ e^- \rightarrow \Upsilon(4S)$

[148] ALBRECHT 88F reports $< 4.7 \times 10^{-4}$ assuming the $\Upsilon(4S)$ decays 45% to $B^0 \overline{B}^0$. We rescale to 50%.

$\Gamma(p\overline{\Lambda})/\Gamma_{total}$ — Γ_{102}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<6 × 10^{-5}	90	[149] AVERY	89B	CLEO	$e^+ e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<9.3 \times 10^{-5}$	90	[150] ALBRECHT	88F	ARG	$e^+ e^- \rightarrow \Upsilon(4S)$

[149] AVERY 89B reports $< 5 \times 10^{-5}$ assuming the $\Upsilon(4S)$ decays 43% to $B^0 \overline{B}^0$. We rescale to 50%.
[150] ALBRECHT 88F reports $< 8.5 \times 10^{-5}$ assuming the $\Upsilon(4S)$ decays 45% to $B^0 \overline{B}^0$. We rescale to 50%.

$\Gamma(p\overline{\Lambda}\pi^+\pi^-)/\Gamma_{total}$ — Γ_{103}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<2.0 × 10^{-4}	90	[151] ALBRECHT	88F	ARG	$e^+ e^- \rightarrow \Upsilon(4S)$

[151] ALBRECHT 88F reports $< 1.8 \times 10^{-4}$ assuming the $\Upsilon(4S)$ decays 45% to $B^0 \overline{B}^0$. We rescale to 50%.

$\Gamma(\overline{\Delta}^0 p)/\Gamma_{total}$ — Γ_{104}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<3.8 × 10^{-4}	90	[152] BORTOLETTO	89	CLEO	$e^+ e^- \rightarrow \Upsilon(4S)$

[152] BORTOLETTO 89 reports $< 3.3 \times 10^{-4}$ assuming the $\Upsilon(4S)$ decays 43% to $B^0 \overline{B}^0$. We rescale to 50%.

$\Gamma(\Delta^{++}\overline{p})/\Gamma_{total}$ — Γ_{105}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<1.5 × 10^{-4}	90	[153] BORTOLETTO	89	CLEO	$e^+ e^- \rightarrow \Upsilon(4S)$

[153] BORTOLETTO 89 reports $< 1.3 \times 10^{-4}$ assuming the $\Upsilon(4S)$ decays 43% to $B^0 \overline{B}^0$. We rescale to 50%.

$\Gamma(\pi^+ e^+ e^-)/\Gamma_{total}$ — Γ_{106}/Γ

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0039	90	[154] WEIR	90B	MRK2	$e^+ e^-$ 29 GeV

[154] WEIR 90B assumes B^+ production cross section from LUND.

$\Gamma(\pi^+ \mu^+ \mu^-)/\Gamma_{total}$ — Γ_{107}/Γ

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0091	90	[155] WEIR	90B	MRK2	$e^+ e^-$ 29 GeV

[155] WEIR 90B assumes B^+ production cross section from LUND.

*CITATION: L. Montanet et al., Physical Review D50, 1173 (1994) and 1995 off-year partial update for the 1996 edition (URL: http://pdg.lbl.gov/)

$\Gamma(K^+ e^+ e^-)/\Gamma_{total}$ — Γ_{108}/Γ

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<6 × 10^{-5}	90	[156] AVERY	89B	CLEO	$e^+ e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<9.9 \times 10^{-5}$	90	[157] ALBRECHT	91E	ARG	$e^+ e^- \to \Upsilon(4S)$
$<6.8 \times 10^{-3}$	90	[158] WEIR	90B	MRK2	$e^+ e^-$ 29 GeV
$<2.5 \times 10^{-4}$	90	[159] AVERY	87	CLEO	$e^+ e^- \to \Upsilon(4S)$

[156] AVERY 89B reports $< 5 \times 10^{-5}$ assuming the $\Upsilon(4S)$ decays 43% to $B^0 \overline{B}^0$. We rescale to 50%.
[157] ALBRECHT 91E reports $< 9.0 \times 10^{-5}$ assuming the $\Upsilon(4S)$ decays 45% to $B^0 \overline{B}^0$. We rescale to 50%.
[158] WEIR 90B assumes B^+ production cross section from LUND.
[159] AVERY 87 reports $< 2.1 \times 10^{-4}$ assuming the $\Upsilon(4S)$ decays 40% to $B^0 \overline{B}^0$. We rescale to 50%.

$\Gamma(K^+ \mu^+ \mu^-)/\Gamma_{total}$ — Γ_{109}/Γ

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<1.7 × 10^{-4}	90	[160] AVERY	89B	CLEO	$e^+ e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<2.4 \times 10^{-4}$	90	[161] ALBRECHT	91E	ARG	$e^+ e^- \to \Upsilon(4S)$
$<6.4 \times 10^{-3}$	90	[162] WEIR	90B	MRK2	$e^+ e^-$ 29 GeV
$<3.8 \times 10^{-4}$	90	[163] AVERY	87	CLEO	$e^+ e^- \to \Upsilon(4S)$

[160] AVERY 89B reports $< 1.5 \times 10^{-4}$ assuming the $\Upsilon(4S)$ decays 43% to $B^0 \overline{B}^0$. We rescale to 50%.
[161] ALBRECHT 91E reports $< 2.2 \times 10^{-4}$ assuming the $\Upsilon(4S)$ decays 45% to $B^0 \overline{B}^0$. We rescale to 50%.
[162] WEIR 90B assumes B^+ production cross section from LUND.
[163] AVERY 87 reports $< 3.2 \times 10^{-4}$ assuming the $\Upsilon(4S)$ decays 40% to $B^0 \overline{B}^0$. We rescale to 50%.

$\Gamma(K^*(892)^+ e^+ e^-)/\Gamma_{total}$ — Γ_{110}/Γ

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<6.9 × 10^{-4}	90	[164] ALBRECHT	91E	ARG	$e^+ e^- \to \Upsilon(4S)$

[164] ALBRECHT 91E reports $< 6.3 \times 10^{-4}$ assuming the $\Upsilon(4S)$ decays 45% to $B^0 \overline{B}^0$. We rescale to 50%.

$\Gamma(K^*(892)^+ \mu^+ \mu^-)/\Gamma_{total}$ — Γ_{111}/Γ

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<1.2 × 10^{-3}	90	[165] ALBRECHT	91E	ARG	$e^+ e^- \to \Upsilon(4S)$

[165] ALBRECHT 91E reports $< 1.1 \times 10^{-3}$ assuming the $\Upsilon(4S)$ decays 45% to $B^0 \overline{B}^0$. We rescale to 50%.

$\Gamma(\pi^+ e^+ \mu^-)/\Gamma_{total}$ — Γ_{112}/Γ

Test of lepton family number conservation.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0064	90	[166] WEIR	90B	MRK2	$e^+ e^-$ 29 GeV

[166] WEIR 90B assumes B^+ production cross section from LUND.

$\Gamma(\pi^+ e^- \mu^+)/\Gamma_{total}$ — Γ_{113}/Γ

Test of lepton family number conservation.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0064	90	[167] WEIR	90B	MRK2	$e^+ e^-$ 29 GeV

[167] WEIR 90B assumes B^+ production cross section from LUND.

$\Gamma(K^+ e^+ \mu^-)/\Gamma_{total}$ — Γ_{114}/Γ

Test of lepton family number conservation.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0064	90	[168] WEIR	90B	MRK2	$e^+ e^-$ 29 GeV

[168] WEIR 90B assumes B^+ production cross section from LUND.

$\Gamma(K^+ e^- \mu^+)/\Gamma_{\text{total}}$ Γ_{115}/Γ

Test of lepton family number conservation.

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0064	90	[169] WEIR 90B	MRK2	$e^+ e^-$ 29 GeV

[169] WEIR 90B assumes B^+ production cross section from LUND.

$\Gamma(\pi^- e^+ e^+)/\Gamma_{\text{total}}$ Γ_{116}/Γ

Test of total lepton number conservation.

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0039	90	[170] WEIR 90B	MRK2	$e^+ e^-$ 29 GeV

[170] WEIR 90B assumes B^+ production cross section from LUND.

$\Gamma(\pi^- \mu^+ \mu^+)/\Gamma_{\text{total}}$ Γ_{117}/Γ

Test of total lepton number conservation.

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0091	90	[171] WEIR 90B	MRK2	$e^+ e^-$ 29 GeV

[171] WEIR 90B assumes B^+ production cross section from LUND.

$\Gamma(\pi^- e^+ \mu^+)/\Gamma_{\text{total}}$ Γ_{118}/Γ

Test of total lepton number conservation.

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0064	90	[172] WEIR 90B	MRK2	$e^+ e^-$ 29 GeV

[172] WEIR 90B assumes B^+ production cross section from LUND.

$\Gamma(K^- e^+ e^+)/\Gamma_{\text{total}}$ Γ_{119}/Γ

Test of total lepton number conservation.

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0039	90	[173] WEIR 90B	MRK2	$e^+ e^-$ 29 GeV

[173] WEIR 90B assumes B^+ production cross section from LUND.

$\Gamma(K^- \mu^+ \mu^+)/\Gamma_{\text{total}}$ Γ_{120}/Γ

Test of total lepton number conservation.

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0091	90	[174] WEIR 90B	MRK2	$e^+ e^-$ 29 GeV

[174] WEIR 90B assumes B^+ production cross section from LUND.

$\Gamma(K^- e^+ \mu^+)/\Gamma_{\text{total}}$ Γ_{121}/Γ

Test of total lepton number conservation.

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0064	90	[175] WEIR 90B	MRK2	$e^+ e^-$ 29 GeV

[175] WEIR 90B assumes B^+ production cross section from LUND.

$B^{\pm}$ REFERENCES

ABE	94D	PRL 72 3456	+Albrow, Amidei, Anway-Wiese, Apollinari	(CDF Collab.)
ALAM	94	PR D50 43	+Kim, Nemati, O'Neill, Severini+	(CLEO Collab.)
ALBRECHT	94D	PL B335 526	+Hamacher, Hofmann, Kirchhoff, Mankel+	(ARGUS Collab.)
ALBRECHT	94G	PL B340 217	+Hamacher, Hofmann, Kirchhoff, Mankel+	(ARGUS Collab.)
ATHANAS	94	PRL 73 3503	+Brower, Masek, Paar, Gronberg+	(CLEO Collab.)
Also	95	PRL 74 3090 (erratum)		
PDG	94	PR D50 1173	Montanet+	(CERN, LBL, BOST, IFIC+)
STONE	94	HEPSY 93-11		
ABREU	93D	ZPHY C57 181	+Adam, Adye, Agasi, Alekseev+	(DELPHI Collab.)
ABREU	93G	PL B312 253	+Adam, Adye, Agasi, Ajinenko+	(DELPHI Collab.)
ACTON	93C	PL B307 247	+Alexander, Allison, Allport, Anderson+	(OPAL Collab.)
ALBRECHT	93E	ZPHY C60 11	+Ehrlichmann, Hamacher, Hofmann+	(ARGUS Collab.)
ALEXANDER	93B	PL B319 365	+Bebek, Berkelman, Bloom, Browder+	(CLEO Collab.)
AMMAR	93	PRL 71 674	+Ball, Baringer, Coppage, Copty+	(CLEO Collab.)
BEAN	93B	PRL 70 2681	+Gronberg, Kutschke, Menary, Morrison+	(CLEO Collab.)
BUSKULIC	93D	PL B307 194	+Decamp, Goy, Lees, Minard+	(ALEPH Collab.)
Also	94H	PL B325 537 (errata)		
SANGHERA	93	PR D47 791	+Skwarnicki, Stroynowski, Artuso, Goldberg+	(CLEO Collab.)
ALBRECHT	92C	PL B275 195	+Ehrlichmann, Hamacher, Krueger, Nau+	(ARGUS Collab.)
ALBRECHT	92E	PL B277 209	+Ehrlichmann, Hamacher, Krueger, Nau+	(ARGUS Collab.)
ALBRECHT	92G	ZPHY C54 1	+Ehrlichmann, Hamacher, Krueger, Nau+	(ARGUS Collab.)
BORTOLETTO	92	PR D45 21	+Brown, Dominick, McIlwain+	(CLEO Collab.)
BUSKULIC	92G	PL B295 396	+Decamp, Goy, Lees, Minard+	(ALEPH Collab.)
KRAMER	92	PL B279 181	+Palmer	(HAMB, OSU)
ALBRECHT	91B	PL B254 288	+Glaeser, Harder, Krueger, Nippe+	(ARGUS Collab.)

ALBRECHT	91C	PL B255 297	+Ehrlichmann, Glaeser, Harder, Krueger+	(ARGUS Collab.)
ALBRECHT	91E	PL B262 148	+Glaeser, Harder, Krueger, Nippe+	(ARGUS Collab.)
BERKELMAN	91	ARNPS 41 1	+Stone	(CORN, SYRA)
"Decays of *B* Mesons"				
FULTON	91	PR D43 651	+Jensen, Johnson, Kagan, Kass+	(CLEO Collab.)
ALBRECHT	90B	PL B241 278	+Glaeser, Harder, Krueger, Nilsson+	(ARGUS Collab.)
ALBRECHT	90J	ZPHY C48 543	+Ehrlichmann, Harder, Krueger+	(ARGUS Collab.)
ANTREASYAN	90B	ZPHY C48 553	+Bartels, Bieler, Bienlein, Bizzeti+	(Crystal Ball Collab.)
BORTOLETTO	90	PRL 64 2117	+Goldberg, Horwitz, Jain, Mestayer+	(CLEO Collab.)
Also	92	PR D45 21	Bortoletto, Brown, Dominick, McIlwain+	(CLEO Collab.)
WEIR	90B	PR D41 1384	+Klein, Abrams, Adolphsen, Akerlof+	(Mark II Collab.)
ALBRECHT	89G	PL B229 304	+Glaeser, Harder, Krueger+	(ARGUS Collab.)
AVERY	89B	PL B223 470	+Besson, Garren, Yelton+	(CLEO Collab.)
BEBEK	89	PRL 62 8	+Berkelman, Blucher+	(CLEO Collab.)
BORTOLETTO	89	PRL 62 2436	+Goldberg, Horwitz, Mestayer+	(CLEO Collab.)
ALBRECHT	88F	PL B209 119	+Boeckmann, Glaeser+	(ARGUS Collab.)
ALBRECHT	88K	PL B215 424	+Boeckmann, Glaeser+	(ARGUS Collab.)
ALBRECHT	87C	PL B185 218	+Binder, Boeckmann, Glaser+	(ARGUS Collab.)
ALBRECHT	87D	PL B199 451	+Andam, Binder, Boeckmann+	(ARGUS Collab.)
AVERY	87	PL B183 429	+Besson, Bowcock, Giles+	(CLEO Collab.)
BEBEK	87	PR D36 1289	+Berkelman, Blucher, Cassel+	(CLEO Collab.)
ALAM	86	PR D34 3279	+Katayama, Kim, Sun+	(CLEO Collab.)
PDG	86	PL 170B	Aguilar-Benitez, Porter+	(CERN, CIT+)
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