B^0

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

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.

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

B^0 MASS

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

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
5279.4±0.5 OUR FIT					
5279.3±0.7 OUR AVERAGE					
5279.1±0.7 ±0.3	135	[1] CSORNA	00	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
5281.3±2.2 ±1.4	51	ABE	96B	CDF	$p\overline{p}$ at 1.8 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
5279.2±0.54±2.0	340	ALAM	94	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
5278.0±0.4 ±2.0		BORTOLETTO	92	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
5279.6±0.7 ±2.0	40	[2] ALBRECHT	90J	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
5278.2±1.0 ±3.0	40	ALBRECHT	87C	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
5279.5±1.6 ±3.0	7	[3] ALBRECHT	87D	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
5280.6±0.8 ±2.0		BEBEK	87	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

[1] CSORNA 00 uses fully reconstructed 135 $B^0 \rightarrow J/\psi^{(\prime)} K^0_S$ events and invariant masses without beam constraint.

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

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

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

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
0.33±0.28 OUR FIT Error includes scale factor of 1.1.				
0.34±0.32 OUR AVERAGE Error includes scale factor of 1.2.				
0.41±0.25±0.19	ALAM	94	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
−0.4 ±0.6 ±0.5	BORTOLETTO	92	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
−0.9 ±1.2 ±0.5	ALBRECHT	90J	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
2.0 ±1.1 ±0.3	[4] BEBEK	87	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

[4] BEBEK 87 actually measure the difference between half of E_{cm} and the $B^{\pm}$ or B^0 mass, so the $m_{B^0} - m_{B^{\pm}}$ is more accurate. Assume $m_{\Upsilon(4S)}$ = 10580 MeV.

$m_{B^0_H} - m_{B^0_L}$

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

B^0 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 Heavy Flavor Averaging Group (HFAG) 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
1.537±0.015 OUR EVALUATION					
$1.523^{+0.024}_{-0.023}\pm0.022$		[5] AUBERT	03C	BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$1.554\pm0.030\pm0.019$		[6] ABE	02H	BELL	$e^+e^- \rightarrow \Upsilon(4S)$
$1.497\pm0.073\pm0.032$		[7] ACOSTA	02C	CDF	$p\overline{p}$ at 1.8 TeV
$1.529\pm0.012\pm0.029$		[8] AUBERT	02H	BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$1.546\pm0.032\pm0.022$		[6] AUBERT	01F	BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$1.541\pm0.028\pm0.023$		[8] ABBIENDI,G	00B	OPAL	$e^+e^- \rightarrow Z$
$1.518\pm0.053\pm0.034$		[9] BARATE	00R	ALEP	$e^+e^- \rightarrow Z$
$1.523\pm0.057\pm0.053$		[10] ABBIENDI	99J	OPAL	$e^+e^- \rightarrow Z$
$1.474\pm0.039^{+0.052}_{-0.051}$		[9] ABE	98Q	CDF	$p\overline{p}$ at 1.8 TeV
$1.52\pm0.06\pm0.04$		[10] ACCIARRI	98S	L3	$e^+e^- \rightarrow Z$
$1.64\pm0.08\pm0.08$		[10] ABE	97J	SLD	$e^+e^- \rightarrow Z$
$1.532\pm0.041\pm0.040$		[11] ABREU	97F	DLPH	$e^+e^- \rightarrow Z$
$1.25^{+0.15}_{-0.13}\pm0.05$	121	[7] BUSKULIC	96J	ALEP	$e^+e^- \rightarrow Z$
$1.49^{+0.17}_{-0.15}{}^{+0.08}_{-0.06}$		[12] BUSKULIC	96J	ALEP	$e^+e^- \rightarrow Z$
$1.61^{+0.14}_{-0.13}\pm0.08$		[9,13] ABREU	95Q	DLPH	$e^+e^- \rightarrow Z$
$1.63\pm0.14\pm0.13$		[14] ADAM	95	DLPH	$e^+e^- \rightarrow Z$
$1.53\pm0.12\pm0.08$		[9,15] AKERS	95T	OPAL	$e^+e^- \rightarrow Z$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$1.58\pm0.09\pm0.02$		[7] ABE	98B	CDF	Repl. by ACOSTA 02C
$1.54\pm0.08\pm0.06$		[9] ABE	96C	CDF	Repl. by ABE 98Q
$1.55\pm0.06\pm0.03$		[16] BUSKULIC	96J	ALEP	$e^+e^- \rightarrow Z$
$1.61\pm0.07\pm0.04$		[9] BUSKULIC	96J	ALEP	Repl. by BARATE 00R
1.62 ± 0.12		[17] ADAM	95	DLPH	$e^+e^- \rightarrow Z$
$1.57\pm0.18\pm0.08$	121	[7] ABE	94D	CDF	Repl. by ABE 98B
$1.17^{+0.29}_{-0.23}\pm0.16$	96	[9] ABREU	93D	DLPH	Sup. by ABREU 95Q
$1.55\pm0.25\pm0.18$	76	[14] ABREU	93G	DLPH	Sup. by ADAM 95
$1.51^{+0.24}_{-0.23}{}^{+0.12}_{-0.14}$	78	[9] ACTON	93C	OPAL	Sup. by AKERS 95T

$1.52\ ^{+0.20}_{-0.18}\ ^{+0.07}_{-0.13}$	77	[9] BUSKULIC	93D	ALEP	Sup. by BUSKULIC 96J
$1.20\ ^{+0.52}_{-0.36}\ ^{+0.16}_{-0.14}$	15	[18] WAGNER	90	MRK2	E^{ee}_{cm}= 29 GeV
$0.82\ ^{+0.57}_{-0.37}\ \pm0.27$		[19] AVERILL	89	HRS	E^{ee}_{cm}= 29 GeV

[5] AUBERT 03C uses a sample of approximately 14,000 exclusively reconstructed $B^0 \to D^*(2010)^- \ell \nu$ and simultaneously measures the lifetime and oscillation frequency.
[6] Events are selected in which one B meson is fully reconstructed while the second B meson is reconstructed inclusively.
[7] Measured mean life using fully reconstructed decays.
[8] Data analyzed using partially reconsturcted $\overline{B}^0 \to D^{*+} \ell^- \overline{\nu}$ decays.
[9] Data analyzed using $D/D^* \ell$X event vertices.
[10] Data analyzed using charge of secondary vertex.
[11] Data analyzed using inclusive $D/D^* \ell X$.
[12] Measured mean life using partially reconstructed $D^{*-} \pi^+$X vertices.
[13] ABREU 95Q assumes B($B^0 \to D^{**-} \ell^+ \nu_\ell$) = 3.2 ± 1.7%.
[14] Data analyzed using vertex-charge technique to tag B charge.
[15] AKERS 95T assumes B($B^0 \to D_s^{(*)} D^{0(*)}$) = 5.0 ± 0.9% to find B^+/B^0 yield.
[16] Combined result of $D/D^* \ell$x analysis, fully reconstructed B analysis, and partially reconstructed $D^{*-} \pi^+$X analysis.
[17] Combined ABREU 95Q and ADAM 95 result.
[18] WAGNER 90 tagged B^0 mesons by their decays into $D^{*-} e^+ \nu$ and $D^{*-} \mu^+ \nu$ where the D^{*-} is tagged by its decay into $\pi^- \overline{D}^0$.
[19] AVERILL 89 is an estimate of the B^0 mean lifetime assuming that $B^0 \to D^{*+}$ + X always.

MEAN LIFE RATIO τ_{B^+}/τ_{B^0}

τ_{B^+}/τ_{B^0} (direct measurements)

"OUR EVALUATION" is an average of the data listed below performed by the Heavy Flavor Averaging Group (HFAG) 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	EVTS	DOCUMENT ID		TECN	COMMENT
The data in this block is included in the average printed for a previous datablock.					
1.085±0.017 OUR EVALUATION					
1.091±0.023±0.014		[20] ABE	02H	BELL	$e^+ e^- \to \Upsilon(4S)$
1.093±0.066±0.028		[21] ACOSTA	02C	CDF	$p\overline{p}$ at 1.8 TeV
1.082±0.026±0.012		[20] AUBERT	01F	BABR	$e^+ e^- \to \Upsilon(4S)$
1.085±0.059±0.018		[22] BARATE	00R	ALEP	$e^+ e^- \to Z$
1.079±0.064±0.041		[23] ABBIENDI	99J	OPAL	$e^+ e^- \to Z$
$1.110\pm0.056\ ^{+0.033}_{-0.030}$		[22] ABE	98Q	CDF	$p\overline{p}$ at 1.8 TeV
1.09 ±0.07 ±0.03		[23] ACCIARRI	98S	L3	$e^+ e^- \to Z$
1.01 ±0.07 ±0.06		[23] ABE	97J	SLD	$e^+ e^- \to Z$
$1.27\ ^{+0.23}_{-0.19}\ ^{+0.03}_{-0.02}$		[21] BUSKULIC	96J	ALEP	$e^+ e^- \to Z$
$1.00\ ^{+0.17}_{-0.15}\ \pm0.10$		[22,24] ABREU	95Q	DLPH	$e^+ e^- \to Z$
$1.06\ ^{+0.13}_{-0.10}\ \pm0.10$		[25] ADAM	95	DLPH	$e^+ e^- \to Z$
$0.99\ \pm0.14\ ^{+0.05}_{-0.04}$		[22,26] AKERS	95T	OPAL	$e^+ e^- \to Z$

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

$1.06 \pm 0.07 \pm 0.02$		[21] ABE	98B	CDF	Repl. by ACOSTA 02C
$1.01 \pm 0.11 \pm 0.02$		[22] ABE	96C	CDF	Repl. by ABE 98Q
$1.03 \pm 0.08 \pm 0.02$		[27] BUSKULIC	96J	ALEP	$e^+e^- \rightarrow Z$
$0.98 \pm 0.08 \pm 0.03$		[22] BUSKULIC	96J	ALEP	Repl. by BARATE 00R
$1.02 \pm 0.16 \pm 0.05$	269	[21] ABE	94D	CDF	Repl. by ABE 98B
$1.11 {}^{+0.51}_{-0.39} \pm 0.11$	188	[22] ABREU	93D	DLPH	Sup. by ABREU 95Q
$1.01 {}^{+0.29}_{-0.22} \pm 0.12$	253	[25] ABREU	93G	DLPH	Sup. by ADAM 95
$1.0 {}^{+0.33}_{-0.25} \pm 0.08$	130	ACTON	93C	OPAL	Sup. by AKERS 95T
$0.96 {}^{+0.19}_{-0.15} {}^{+0.18}_{-0.12}$	154	[22] BUSKULIC	93D	ALEP	Sup. by BUSKULIC 96J

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

[21] Measured using fully reconstructed decays.

[22] Data analyzed using $D/D^* \ell X$ vertices.

[23] Data analyzed using charge of secondary vertex.

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

[25] Data analyzed using vertex-charge technique to tag B charge.

[26] AKERS 95T assumes B($B^0 \rightarrow D_s^{(*)} D^{0(*)}$) = 5.0 ± 0.9% to find B^+/B^0 yield.

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

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

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

VALUE	*CL%*	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*

The data in this block is included in the average printed for a previous datablock.

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

$0.95 {}^{+0.117}_{-0.080} \pm 0.091$			[28] ARTUSO	97	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
$1.15 \pm 0.17 \pm 0.06$			[29] JESSOP	97	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
$0.93 \pm 0.18 \pm 0.12$			[30] ATHANAS	94	CLE2	Sup. by ARTUSO 97
$0.91 \pm 0.27 \pm 0.21$			[31] ALBRECHT	92C	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
1.0 ± 0.4		29	[31,32] ALBRECHT	92G	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
$0.89 \pm 0.19 \pm 0.13$			[31] FULTON	91	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
$1.00 \pm 0.23 \pm 0.14$			[31] ALBRECHT	89L	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
0.49 to 2.3	90		[33] BEAN	87B	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

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

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

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

[31] Assumes equal production of B^0 and B^+.

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

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

$\left|\Delta\Gamma_{B^0_d}\right| / \Gamma_{B^0_d}$

$\Gamma_{B^0_d}$ and $\left|\Delta\Gamma_{B^0_d}\right|$ are the decay rate average and difference between two B^0_d *CP* eigenstates.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.18	95	[34] ABDALLAH	03B	DLPH	$e^+ e^- \rightarrow Z$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.80	95	[35,36] BEHRENS	00B	CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$

[34] Using the measured τ_{B^0}=1.55 ± 0.03 ps.

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

[36] Assumes Δ_{md}=0.478 ± 0.018 ps^{-1} and τ_{B^0}=1.548 ± 0.032 ps.

B^0 DECAY MODES

$\overline{B}^0$ modes are charge conjugates of the modes below. Reactions indicate the weak decay vertex and do not include mixing. Modes which do not identify the charge state of the B are listed in the $B^\pm/B^0$ ADMIXTURE section.

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

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

	Mode		Fraction (Γ_i/Γ)	Scale factor/ Confidence level
Γ_1	$\ell^+ \nu_\ell$ anything	[a]	(10.5 ±0.8) %	
Γ_2	$D^- \ell^+ \nu_\ell$	[a]	(2.14±0.20) %	
Γ_3	$D^*(2010)^- \ell^+ \nu_\ell$	[a]	(5.53±0.23) %	
Γ_4	$\rho^- \ell^+ \nu_\ell$	[a]	$(2.6\ ^{+0.6}_{-0.7}) \times 10^{-4}$	
Γ_5	$\pi^- \ell^+ \nu_\ell$		$(1.8 \pm 0.6) \times 10^{-4}$	
	Inclusive modes			
Γ_6	$\pi^- \mu^+ \nu_\mu$			
Γ_7	K^+ anything		(78 ±8) %	

D, D^*, or D_s modes

Γ_{8}	$D^- \pi^+$	(2.76±0.25) × 10^{-3}		
Γ_{9}	$D^- \rho^+$	(8.0 ±1.4) × 10^{-3}		
Γ_{10}	$D^- K^*(892)^+$	(3.7 ±1.8) × 10^{-4}		
Γ_{11}	$D^- \omega \pi^+$	(2.8 ±0.6) × 10^{-3}		
Γ_{12}	$D^- K^+$	(2.0 ±0.6) × 10^{-4}		
Γ_{13}	$D^- K^+ \overline{K}^0$	< 3.1	× 10^{-4}	CL=90%
Γ_{14}	$D^- K^+ \overline{K}^*(892)^0$	(8.8 ±1.9) × 10^{-4}		
Γ_{15}	$\overline{D}^0 \pi^+ \pi^-$	(8.0 ±1.6) × 10^{-4}		
Γ_{16}	$D^*(2010)^- \pi^+$	(2.76±0.21) × 10^{-3}		
Γ_{17}	$D^- \pi^+ \pi^+ \pi^-$	(8.0 ±2.5) × 10^{-3}		
Γ_{18}	$(D^- \pi^+ \pi^+ \pi^-)$ nonresonant	(3.9 ±1.9) × 10^{-3}		
Γ_{19}	$D^- \pi^+ \rho^0$	(1.1 ±1.0) × 10^{-3}		
Γ_{20}	$D^- a_1(1260)^+$	(6.0 ±3.3) × 10^{-3}		
Γ_{21}	$D^*(2010)^- \pi^+ \pi^0$	(1.5 ±0.5) %		
Γ_{22}	$D^*(2010)^- \rho^+$	(7.3 ±1.5) × 10^{-3}		
Γ_{23}	$D^*(2010)^- K^+$	(2.0 ±0.5) × 10^{-4}		
Γ_{24}	$D^*(2010)^- K^*(892)^+$	(3.8 ±1.5) × 10^{-4}		
Γ_{25}	$D^*(2010)^- K^+ \overline{K}^0$	< 4.7	× 10^{-4}	CL=90%
Γ_{26}	$D^*(2010)^- K^+ \overline{K}^*(892)^0$	(1.29±0.33) × 10^{-3}		
Γ_{27}	$D^*(2010)^- \pi^+ \pi^+ \pi^-$	(7.6 ±1.8) × 10^{-3}		S=1.4
Γ_{28}	$(D^*(2010)^- \pi^+ \pi^+ \pi^-)$ non-resonant	(0.0 ±2.5) × 10^{-3}		
Γ_{29}	$D^*(2010)^- \pi^+ \rho^0$	(5.7 ±3.2) × 10^{-3}		
Γ_{30}	$D^*(2010)^- a_1(1260)^+$	(1.30±0.27) %		
Γ_{31}	$D^*(2010)^- \pi^+ \pi^+ \pi^- \pi^0$	(1.76±0.27) %		
Γ_{32}	$D^*(2010)^+ \pi^+ \pi^- \pi^- \pi^0$	(1.8 ±0.7) %		
Γ_{33}	$D^*(2010)^- p \overline{p} \pi^+$	(6.5 ±1.6) × 10^{-4}		
Γ_{34}	$D^*(2010)^- p \overline{n}$	(1.5 ±0.4) × 10^{-3}		
Γ_{35}	$\overline{D}^*(2010)^- \omega \pi^+$	(2.9 ±0.5) × 10^{-3}		
Γ_{36}	$\overline{D}_2^*(2460)^- \pi^+$	< 2.2	× 10^{-3}	CL=90%
Γ_{37}	$\overline{D}_2^*(2460)^- \rho^+$	< 4.9	× 10^{-3}	CL=90%
Γ_{38}	$D^- D^+$	< 9.4	× 10^{-4}	CL=90%
Γ_{39}	$D^- D_s^+$	(8.0 ±3.0) × 10^{-3}		
Γ_{40}	$D^*(2010)^- D_s^+$	(1.11±0.33) %		
Γ_{41}	$D^- D_s^{*+}$	(1.0 ±0.5) %		
Γ_{42}	$D^*(2010)^- D_s^{*+}$	(1.8 ±0.6) %		
Γ_{43}	$D_s^+ \pi^-$	(2.7 ±1.0) × 10^{-5}		
Γ_{44}	$D_s^{*+} \pi^-$	< 4.1	× 10^{-5}	CL=90%
Γ_{45}	$D_s^+ \rho^-$	< 7	× 10^{-4}	CL=90%
Γ_{46}	$D_s^{*+} \rho^-$	< 8	× 10^{-4}	CL=90%
Γ_{47}	$D_s^+ a_1(1260)^-$	< 2.6	× 10^{-3}	CL=90%
Γ_{48}	$D_s^{*+} a_1(1260)^-$	< 2.2	× 10^{-3}	CL=90%

Γ_{49}	$D_s^- K^+$	$(3.8 \pm 1.3) \times 10^{-5}$	
Γ_{50}	$D_s^{*-} K^+$	$< 2.5 \times 10^{-5}$	CL=90%
Γ_{51}	$D_s^- K^*(892)^+$	$< 9.9 \times 10^{-4}$	CL=90%
Γ_{52}	$D_s^{*-} K^*(892)^+$	$< 1.1 \times 10^{-3}$	CL=90%
Γ_{53}	$D_s^- \pi^+ K^0$	$< 5 \times 10^{-3}$	CL=90%
Γ_{54}	$D_s^{*-} \pi^+ K^0$	$< 3.1 \times 10^{-3}$	CL=90%
Γ_{55}	$D_s^- \pi^+ K^*(892)^0$	$< 4 \times 10^{-3}$	CL=90%
Γ_{56}	$D_s^{*-} \pi^+ K^*(892)^0$	$< 2.0 \times 10^{-3}$	CL=90%
Γ_{57}	$\overline{D}^0 K^0$	$(5.0 \pm 1.4) \times 10^{-5}$	
Γ_{58}	$\overline{D}^0 K^*(892)^0$	$(4.8 \pm 1.2) \times 10^{-5}$	
Γ_{59}	$\overline{D}^0 \pi^0$	$(2.9 \pm 0.5) \times 10^{-4}$	
Γ_{60}	$\overline{D}^0 \rho^0$	$(2.9 \pm 1.1) \times 10^{-4}$	
Γ_{61}	$\overline{D}^0 \eta$	$(1.4 {}^{+0.6}_{-0.5}) \times 10^{-4}$	
Γ_{62}	$\overline{D}^0 \eta'$	$< 9.4 \times 10^{-4}$	CL=90%
Γ_{63}	$\overline{D}^0 \omega$	$(1.8 \pm 0.6) \times 10^{-4}$	
Γ_{64}	$D^0 K^*(892)^0$	$< 1.8 \times 10^{-5}$	CL=90%
Γ_{65}	$\overline{D}^{*0} \gamma$	$< 5.0 \times 10^{-5}$	CL=90%
Γ_{66}	$\overline{D}^*(2007)^0 \pi^0$	$(2.5 \pm 0.7) \times 10^{-4}$	
Γ_{67}	$\overline{D}^*(2007)^0 \rho^0$	$< 5.1 \times 10^{-4}$	CL=90%
Γ_{68}	$\overline{D}^*(2007)^0 \eta$	$< 2.6 \times 10^{-4}$	CL=90%
Γ_{69}	$\overline{D}^*(2007)^0 \eta'$	$< 1.4 \times 10^{-3}$	CL=90%
Γ_{70}	$\overline{D}^*(2007)^0 \omega$	$< 7.4 \times 10^{-4}$	CL=90%
Γ_{71}	$\overline{D}^*(2007)^0 \pi^+ \pi^-$	$(6.2 \pm 2.2) \times 10^{-4}$	
Γ_{72}	$\overline{D}^*(2007)^0 K^0$	$< 6.6 \times 10^{-5}$	CL=90%
Γ_{73}	$\overline{D}^*(2007)^0 K^*(892)^0$	$< 6.9 \times 10^{-5}$	CL=90%
Γ_{74}	$D^*(2007)^0 K^*(892)^0$	$< 4.0 \times 10^{-5}$	CL=90%
Γ_{75}	$D^*(2007)^0 \pi^+ \pi^+ \pi^- \pi^-$	$(3.0 \pm 0.9) \times 10^{-3}$	
Γ_{76}	$D^*(2010)^+ D^*(2010)^-$	$(8.7 \pm 1.8) \times 10^{-4}$	
Γ_{77}	$D^*(2010)^+ D^-$	$< 6.3 \times 10^{-4}$	CL=90%
Γ_{78}	$D^*(2010)^- D^+ +$ $D^*(2010)^+ D^-$	$(1.17 \pm 0.35) \times 10^{-3}$	
Γ_{79}	$D^{(*)0} \overline{D}^{(*)0}$	< 2.7 %	CL=90%

Charmonium modes

Γ_{80}	$\eta_c K^0$	$(1.2 \pm 0.4) \times 10^{-3}$	
Γ_{81}	$\eta_c K^*(892)^0$	$(1.6 \pm 0.7) \times 10^{-3}$	
Γ_{82}	$J/\psi(1S) K^0$	$(8.5 \pm 0.5) \times 10^{-4}$	
Γ_{83}	$J/\psi(1S) K^+ \pi^-$	$(1.2 \pm 0.6) \times 10^{-3}$	
Γ_{84}	$J/\psi(1S) K^*(892)^0$	$(1.31 \pm 0.07) \times 10^{-3}$	
Γ_{85}	$J/\psi(1S) \phi K^0$	$(8.8 {}^{+3.7}_{-3.3}) \times 10^{-5}$	
Γ_{86}	$J/\psi(1S) K(1270)^0$	$(1.3 \pm 0.5) \times 10^{-3}$	
Γ_{87}	$J/\psi(1S) \pi^0$	$(2.2 \pm 0.4) \times 10^{-5}$	
Γ_{88}	$J/\psi(1S) \eta$	$< 1.2 \times 10^{-3}$	CL=90%

Γ_{89}	$J/\psi(1S)\pi^+\pi^-$		$(4.6 \pm 0.9) \times 10^{-5}$	
Γ_{90}	$J/\psi(1S)\rho^0$		$(1.6 \pm 0.7) \times 10^{-5}$	
Γ_{91}	$J/\psi(1S)\omega$		$< 2.7 \times 10^{-4}$	CL=90%
Γ_{92}	$J/\psi(1S)K^0\pi^+\pi^-$		$(1.0 \pm 0.4) \times 10^{-3}$	
Γ_{93}	$J/\psi(1S)K^0\rho^0$		$(5.4 \pm 3.0) \times 10^{-4}$	
Γ_{94}	$J/\psi(1S)K^*(892)^+\pi^-$		$(8 \pm 4) \times 10^{-4}$	
Γ_{95}	$J/\psi(1S)K^*(892)^0\pi^+\pi^-$		$(6.6 \pm 2.2) \times 10^{-4}$	
Γ_{96}	$\psi(2S)K^0$		$(6.2 \pm 0.7) \times 10^{-4}$	
Γ_{97}	$\psi(2S)K^+\pi^-$		$< 1 \times 10^{-3}$	CL=90%
Γ_{98}	$\psi(2S)K^*(892)^0$		$(8.0 \pm 1.3) \times 10^{-4}$	
Γ_{99}	$\chi_{c0}(1P)K^0$		$< 5.0 \times 10^{-4}$	CL=90%
Γ_{100}	$\chi_{c1}(1P)K^0$		$(4.0 {}^{+1.2}_{-1.0}) \times 10^{-4}$	
Γ_{101}	$\chi_{c1}(1P)K^*(892)^0$		$(4.1 \pm 1.5) \times 10^{-4}$	

K or *K** modes

Γ_{102}	$K^+\pi^-$		$(1.85 \pm 0.12) \times 10^{-5}$	S=1.2
Γ_{103}	$K^0\pi^0$		$(9.0 \pm 2.2) \times 10^{-6}$	
Γ_{104}	$\eta' K^0$		$(5.8 {}^{+1.4}_{-1.3}) \times 10^{-5}$	S=1.5
Γ_{105}	$\eta' K^*(892)^0$		$< 2.4 \times 10^{-5}$	CL=90%
Γ_{106}	$\eta K^*(892)^0$		$(1.4 {}^{+0.6}_{-0.5}) \times 10^{-5}$	
Γ_{107}	ηK^0		$< 9.3 \times 10^{-6}$	CL=90%
Γ_{108}	ωK^0		$< 1.3 \times 10^{-5}$	CL=90%
Γ_{109}	$K^0_S X^0$ (Familon)		$< 5.3 \times 10^{-5}$	CL=90%
Γ_{110}	$\omega K^*(892)^0$		$< 2.3 \times 10^{-5}$	CL=90%
Γ_{111}	K^+K^-			
Γ_{112}	$K^0\overline{K}^0$		$< 4.1 \times 10^{-6}$	CL=90%
Γ_{113}	$K^+\pi^-\pi^0$		$< 4.0 \times 10^{-5}$	CL=90%
Γ_{114}	$K^+\rho^-$		$< 3.2 \times 10^{-5}$	CL=90%
Γ_{115}	$K^0\pi^+\pi^-$		$(5.0 \pm 1.2) \times 10^{-5}$	
Γ_{116}	$K^0\rho^0$		$< 3.9 \times 10^{-5}$	CL=90%
Γ_{117}	$K^0 f_0(980)$		$< 3.6 \times 10^{-4}$	CL=90%
Γ_{118}	$K^*(892)^+\pi^-$		$(1.6 {}^{+0.6}_{-0.5}) \times 10^{-5}$	
Γ_{119}	$K^*(892)^0\pi^0$		$< 3.6 \times 10^{-6}$	CL=90%
Γ_{120}	$K_2^*(1430)^+\pi^-$		$< 2.6 \times 10^{-3}$	CL=90%
Γ_{121}	$K^0K^-\pi^+$		$< 2.1 \times 10^{-5}$	CL=90%
Γ_{122}	$K^+K^-\pi^0$		$< 1.9 \times 10^{-5}$	CL=90%
Γ_{123}	$K^0K^+K^-$		$< 1.3 \times 10^{-3}$	CL=90%
Γ_{124}	$K^0\phi$		$(8.1 {}^{+3.2}_{-2.6}) \times 10^{-6}$	
Γ_{125}	$K^-\pi^+\pi^+\pi^-$	[b]	$< 2.3 \times 10^{-4}$	CL=90%
Γ_{126}	$K^*(892)^0\pi^+\pi^-$		$< 1.4 \times 10^{-3}$	CL=90%
Γ_{127}	$K^*(892)^0\rho^0$		$< 3.4 \times 10^{-5}$	CL=90%

Γ_{128}	$K^*(892)^0 f_0(980)$		$<$ 1.7	$\times 10^{-4}$	CL=90%
Γ_{129}	$K_1(1400)^+ \pi^-$		$<$ 1.1	$\times 10^{-3}$	CL=90%
Γ_{130}	$K^- a_1(1260)^+$	[*b*]	$<$ 2.3	$\times 10^{-4}$	CL=90%
Γ_{131}	$K^*(892)^0 K^+ K^-$		$<$ 6.1	$\times 10^{-4}$	CL=90%
Γ_{132}	$K^*(892)^0 \phi$		$(9.5\ ^{+2.4}_{-2.0})$	$\times 10^{-6}$	
Γ_{133}	$\overline{K}^*(892)^0 K^*(892)^0$		$<$ 2.2	$\times 10^{-5}$	CL=90%
Γ_{134}	$K^*(892)^0 K^*(892)^0$		$<$ 3.7	$\times 10^{-5}$	CL=90%
Γ_{135}	$K^*(892)^+ K^*(892)^-$		$<$ 1.41	$\times 10^{-4}$	CL=90%
Γ_{136}	$K_1(1400)^0 \rho^0$		$<$ 3.0	$\times 10^{-3}$	CL=90%
Γ_{137}	$K_1(1400)^0 \phi$		$<$ 5.0	$\times 10^{-3}$	CL=90%
Γ_{138}	$K_2^*(1430)^0 \rho^0$		$<$ 1.1	$\times 10^{-3}$	CL=90%
Γ_{139}	$K_2^*(1430)^0 \phi$		$<$ 1.4	$\times 10^{-3}$	CL=90%
Γ_{140}	$K^*(892)^0 \gamma$		(4.3 ± 0.4)	$\times 10^{-5}$	
Γ_{141}	$K^+ \pi^- \gamma$		(4.6 ± 1.4)	$\times 10^{-6}$	
Γ_{142}	$K^*(1410) \gamma$		$<$ 1.3	$\times 10^{-4}$	CL=90%
Γ_{143}	$K^+ \pi^- \gamma$ (NR)		$<$ 2.6	$\times 10^{-6}$	CL=90%
Γ_{144}	$K_1(1270)^0 \gamma$		$<$ 7.0	$\times 10^{-3}$	CL=90%
Γ_{145}	$K_1(1400)^0 \gamma$		$<$ 4.3	$\times 10^{-3}$	CL=90%
Γ_{146}	$K_2^*(1430)^0 \gamma$		(1.3 ± 0.5)	$\times 10^{-5}$	
Γ_{147}	$K^*(1680)^0 \gamma$		$<$ 2.0	$\times 10^{-3}$	CL=90%
Γ_{148}	$K_3^*(1780)^0 \gamma$		$<$ 1.0	%	CL=90%
Γ_{149}	$K_4^*(2045)^0 \gamma$		$<$ 4.3	$\times 10^{-3}$	CL=90%

Light unflavored meson modes

Γ_{150}	$\rho^0 \gamma$	$<$ 1.7	$\times 10^{-5}$	CL=90%
Γ_{151}	$\omega \gamma$	$<$ 9.2	$\times 10^{-6}$	CL=90%
Γ_{152}	$\phi \gamma$	$<$ 3.3	$\times 10^{-6}$	CL=90%
Γ_{153}	$\pi^+ \pi^-$	(4.8 ± 0.5)	$\times 10^{-6}$	
Γ_{154}	$\pi^0 \pi^0$	$<$ 5.7	$\times 10^{-6}$	CL=90%
Γ_{155}	$\eta \pi^0$	$<$ 2.9	$\times 10^{-6}$	CL=90%
Γ_{156}	$\eta \eta$	$<$ 1.8	$\times 10^{-5}$	CL=90%
Γ_{157}	$\eta' \pi^0$	$<$ 5.7	$\times 10^{-6}$	CL=90%
Γ_{158}	$\eta' \eta'$	$<$ 4.7	$\times 10^{-5}$	CL=90%
Γ_{159}	$\eta' \eta$	$<$ 2.7	$\times 10^{-5}$	CL=90%
Γ_{160}	$\eta' \rho^0$	$<$ 1.2	$\times 10^{-5}$	CL=90%
Γ_{161}	$\eta \rho^0$	$<$ 1.0	$\times 10^{-5}$	CL=90%
Γ_{162}	$\omega \eta$	$<$ 1.2	$\times 10^{-5}$	CL=90%
Γ_{163}	$\omega \eta'$	$<$ 6.0	$\times 10^{-5}$	CL=90%
Γ_{164}	$\omega \rho^0$	$<$ 1.1	$\times 10^{-5}$	CL=90%
Γ_{165}	$\omega \omega$	$<$ 1.9	$\times 10^{-5}$	CL=90%
Γ_{166}	$\phi \pi^0$	$<$ 5	$\times 10^{-6}$	CL=90%
Γ_{167}	$\phi \eta$	$<$ 9	$\times 10^{-6}$	CL=90%
Γ_{168}	$\phi \eta'$	$<$ 3.1	$\times 10^{-5}$	CL=90%

Γ_{169}	$\phi\rho^0$		< 1.3	$\times 10^{-5}$	CL=90%
Γ_{170}	$\phi\omega$		< 2.1	$\times 10^{-5}$	CL=90%
Γ_{171}	$\phi\phi$		< 1.2	$\times 10^{-5}$	CL=90%
Γ_{172}	$\pi^+\pi^-\pi^0$		< 7.2	$\times 10^{-4}$	CL=90%
Γ_{173}	$\rho^0\pi^0$		< 5.3	$\times 10^{-6}$	CL=90%
Γ_{174}	$\rho^\mp\pi^\pm$	[c]	(2.3 ±0.5)	$\times 10^{-5}$	
Γ_{175}	$\pi^+\pi^-\pi^+\pi^-$		< 2.3	$\times 10^{-4}$	CL=90%
Γ_{176}	$\rho^0\rho^0$		< 1.8	$\times 10^{-5}$	CL=90%
Γ_{177}	$a_1(1260)^\mp\pi^\pm$	[c]	< 4.9	$\times 10^{-4}$	CL=90%
Γ_{178}	$a_2(1320)^\mp\pi^\pm$	[c]	< 3.0	$\times 10^{-4}$	CL=90%
Γ_{179}	$\pi^+\pi^-\pi^0\pi^0$		< 3.1	$\times 10^{-3}$	CL=90%
Γ_{180}	$\rho^+\rho^-$		< 2.2	$\times 10^{-3}$	CL=90%
Γ_{181}	$a_1(1260)^0\pi^0$		< 1.1	$\times 10^{-3}$	CL=90%
Γ_{182}	$\omega\pi^0$		< 3	$\times 10^{-6}$	CL=90%
Γ_{183}	$\pi^+\pi^+\pi^-\pi^-\pi^0$		< 9.0	$\times 10^{-3}$	CL=90%
Γ_{184}	$a_1(1260)^+\rho^-$		< 3.4	$\times 10^{-3}$	CL=90%
Γ_{185}	$a_1(1260)^0\rho^0$		< 2.4	$\times 10^{-3}$	CL=90%
Γ_{186}	$\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-$		< 3.0	$\times 10^{-3}$	CL=90%
Γ_{187}	$a_1(1260)^+a_1(1260)^-$		< 2.8	$\times 10^{-3}$	CL=90%
Γ_{188}	$\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^0$		< 1.1	%	CL=90%

Baryon modes

Γ_{189}	$p\overline{p}$		< 1.2	$\times 10^{-6}$	CL=90%
Γ_{190}	$p\overline{p}\pi^+\pi^-$		< 2.5	$\times 10^{-4}$	CL=90%
Γ_{191}	$p\overline{p}K^0$		< 7.2	$\times 10^{-6}$	CL=90%
Γ_{192}	$p\overline{\Lambda}\pi^-$		< 1.3	$\times 10^{-5}$	CL=90%
Γ_{193}	$\overline{\Lambda}\Lambda$		< 1.0	$\times 10^{-6}$	CL=90%
Γ_{194}	$\Delta^0\overline{\Delta}^0$		< 1.5	$\times 10^{-3}$	CL=90%
Γ_{195}	$\Delta^{++}\Delta^{--}$		< 1.1	$\times 10^{-4}$	CL=90%
Γ_{196}	$\overline{D}^0 p\overline{p}$		(1.18±0.22)	$\times 10^{-4}$	
Γ_{197}	$\overline{D}^*(2007)^0 p\overline{p}$		(1.2 ±0.4)	$\times 10^{-4}$	
Γ_{198}	$\overline{\Sigma}_c^{--}\Delta^{++}$		< 1.0	$\times 10^{-3}$	CL=90%
Γ_{199}	$\overline{\Lambda}_c^- p\pi^+\pi^-$		(1.3 ±0.4)	$\times 10^{-3}$	
Γ_{200}	$\overline{\Lambda}_c^- p$		(2.2 ±0.8)	$\times 10^{-5}$	
Γ_{201}	$\overline{\Lambda}_c^- p\pi^0$		< 5.9	$\times 10^{-4}$	CL=90%
Γ_{202}	$\overline{\Lambda}_c^- p\pi^+\pi^-\pi^0$		< 5.07	$\times 10^{-3}$	CL=90%
Γ_{203}	$\overline{\Lambda}_c^- p\pi^+\pi^-\pi^+\pi^-$		< 2.74	$\times 10^{-3}$	CL=90%
Γ_{204}	$\overline{\Sigma}_c(2520)^{--} p\pi^+$		(1.6 ±0.7)	$\times 10^{-4}$	
Γ_{205}	$\overline{\Sigma}_c(2520)^0 p\pi^-$		< 1.21	$\times 10^{-4}$	CL=90%
Γ_{206}	$\overline{\Sigma}_c(2455)^0 p\pi^-$		(10 ±8)	$\times 10^{-5}$	S=1.7
Γ_{207}	$\Sigma_c(2455)^{--} p\pi^+$		(2.8 ±0.9)	$\times 10^{-4}$	
Γ_{208}	$\Lambda_{c1}^- p$		< 1.1	$\times 10^{-4}$	CL=90%

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

Γ_{209}	$\gamma\gamma$			< 1.7	$\times 10^{-6}$	CL=90%
Γ_{210}	$e^+ e^-$	*B1*		< 8.3	$\times 10^{-7}$	CL=90%
Γ_{211}	$\mu^+ \mu^-$	*B1*		< 6.1	$\times 10^{-7}$	CL=90%
Γ_{212}	$K^0 e^+ e^-$	*B1*		< 2.7	$\times 10^{-6}$	CL=90%
Γ_{213}	$K^0 \mu^+ \mu^-$	*B1*		< 3.3	$\times 10^{-6}$	CL=90%
Γ_{214}	$K^*(892)^0 e^+ e^-$	*B1*		< 6.4	$\times 10^{-6}$	CL=90%
Γ_{215}	$K^*(892)^0 \mu^+ \mu^-$	*B1*		< 3.3	$\times 10^{-6}$	CL=90%
Γ_{216}	$K^*(892)^0 \nu\overline{\nu}$	*B1*		< 1.0	$\times 10^{-3}$	CL=90%
Γ_{217}	$e^\pm \mu^\mp$	*LF*	[c]	< 1.5	$\times 10^{-6}$	CL=90%
Γ_{218}	$K^0 e^\pm \mu^\mp$	*LF*		< 4.0	$\times 10^{-6}$	CL=90%
Γ_{219}	$K^*(892)^0 e^\pm \mu^\mp$	*LF*		< 3.4	$\times 10^{-6}$	CL=90%
Γ_{220}	$e^\pm \tau^\mp$	*LF*	[c]	< 5.3	$\times 10^{-4}$	CL=90%
Γ_{221}	$\mu^\pm \tau^\mp$	*LF*	[c]	< 8.3	$\times 10^{-4}$	CL=90%

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

[b] B^0 and B_s^0 contributions not separated. Limit is on weighted average of the two decay rates.

[c] The value is for the sum of the charge states or particle/antiparticle states indicated.

B^0 BRANCHING RATIOS

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

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

VALUE	DOCUMENT ID		TECN	COMMENT
0.105 ±0.008 OUR AVERAGE				
0.1078±0.0060±0.0069	[37] ARTUSO	97	CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$
0.093 ±0.011 ±0.015	ALBRECHT	94	ARG	$e^+ e^- \rightarrow \Upsilon(4S)$
0.099 ±0.030 ±0.009	HENDERSON	92	CLEO	$e^+ e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.109 ±0.007 ±0.011	ATHANAS	94	CLE2	Sup. by ARTUSO 97

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

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

ℓ denotes e or μ, not the sum.

"OUR EVALUATION" is an average of the data listed below performed by the Heavy Flavor Averaging Group (HFAG)

VALUE	DOCUMENT ID		TECN	COMMENT
0.0214±0.0020 OUR EVALUATION				
0.0213±0.0018 OUR AVERAGE				
0.0213±0.0012±0.0039	ABE	02E	BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
0.0209±0.0013±0.0018	[38] BARTELT	99	CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$
0.0235±0.0020±0.0044	[39] BUSKULIC	97	ALEP	$e^+ e^- \rightarrow Z$

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

$0.0187\pm0.0015\pm0.0032$	[40] ATHANAS	97	CLE2	Repl. by BARTELT 99
$0.018\ \pm0.006\ \pm0.003$	[41] FULTON	91	CLEO	$e^+e^- \to \Upsilon(4S)$
$0.020\ \pm0.007\ \pm0.006$	[42] ALBRECHT	89J	ARG	$e^+e^- \to \Upsilon(4S)$

[38] Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.
[39] BUSKULIC 97 assumes fraction (B^+) = fraction (B^0) = (37.8 ± 2.2)% and PDG 96 values for B lifetime and branching ratio of D^* and D decays.
[40] ATHANAS 97 uses missing energy and missing momentum to reconstruct neutrino.
[41] FULTON 91 assumes assuming equal production of B^0 and B^+ at the $\Upsilon(4S)$ and uses Mark III D and D^* branching ratios.
[42] ALBRECHT 89J reports $0.018 \pm 0.006 \pm 0.005$. We rescale using the method described in STONE 94 but with the updated PDG 94 B($D^0 \to K^-\pi^+$).

$\Gamma(D^*(2010)^-\ell^+\nu_\ell)/\Gamma_{\rm total}$ $\qquad\qquad \Gamma_3/\Gamma$

"OUR EVALUATION" is an average of the data listed below performed by the Heavy Flavor Averaging Group (HFAG)

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.0553±0.0023 OUR EVALUATION					
0.0519±0.0032 OUR AVERAGE Error includes scale factor of 1.3. See the ideogram below.					
$0.0609\pm0.0019\pm0.0040$		[43] ADAM	03	CLE2	$e^+e^- \to \Upsilon(4S)$
$0.0459\pm0.0023\pm0.0040$		[44] ABE	02F	BELL	$e^+e^- \to \Upsilon(4S)$
$0.0470\pm0.0013^{+0.0036}_{-0.0031}$		[45] ABREU	01H	DLPH	$e^+e^- \to Z$
$0.0526\pm0.0020\pm0.0046$		[46] ABBIENDI	00Q	OPAL	$e^+e^- \to Z$
$0.0553\pm0.0026\pm0.0052$		[47] BUSKULIC	97	ALEP	$e^+e^- \to Z$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$0.0609\pm0.0019\pm0.0040$		[48] BRIERE	02	CLE2	$e^+e^- \to \Upsilon(4S)$
$0.0508\pm0.0021\pm0.0066$		[49] ACKERSTAFF	97G	OPAL	Repl. by ABBIENDI 00Q
$0.0552\pm0.0017\pm0.0068$		[50] ABREU	96P	DLPH	Repl. by ABREU 01H
$0.0449\pm0.0032\pm0.0039$	376	[51] BARISH	95	CLE2	Repl. by ADAM 03
$0.0518\pm0.0030\pm0.0062$	410	[52] BUSKULIC	95N	ALEP	Sup. by BUSKULIC 97
$0.045\ \pm0.003\ \pm0.004$		[53] ALBRECHT	94	ARG	$e^+e^- \to \Upsilon(4S)$
$0.047\ \pm0.005\ \pm0.005$	235	[54] ALBRECHT	93	ARG	$e^+e^- \to \Upsilon(4S)$
seen	398	[55] SANGHERA	93	CLE2	$e^+e^- \to \Upsilon(4S)$
$0.070\ \pm0.018\ \pm0.014$		[56] ANTREASYAN	90B	CBAL	$e^+e^- \to \Upsilon(4S)$
		[57] ALBRECHT	89C	ARG	$e^+e^- \to \Upsilon(4S)$
$0.060\ \pm0.010\ \pm0.014$		[58] ALBRECHT	89J	ARG	$e^+e^- \to \Upsilon(4S)$
$0.040\ \pm0.004\ \pm0.006$		[59] BORTOLETTO	89B	CLEO	$e^+e^- \to \Upsilon(4S)$
$0.070\ \pm0.012\ \pm0.019$	47	[60] ALBRECHT	87J	ARG	$e^+e^- \to \Upsilon(4S)$

[43] Uses the combined fit of both $B^0 \to D^*(2010)^-\ell\nu$ and $B^+ \to \overline{D}(2007)^0\ell\nu$ samples.
[44] Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.
[45] ABREU 01H measured using about 5000 partial reconstructed D^* sample.
[46] ABBIENDI 00Q assumes the fraction B($b \to B^0$)= $(39.7^{+1.8}_{-2.2})$%. This result is an average of two methods using exclusive and partial D^* reconstruction.
[47] BUSKULIC 97 assumes fraction (B^+) = fraction (B^0) = (37.8 ± 2.2)% and PDG 96 values for B lifetime and D^* and D branching fractions.

[48] The results are based on the same analysis and data sample reported in ADAM 03.

[49] ACKERSTAFF 97G assumes fraction (B^+) = fraction (B^0) = (37.8 ± 2.2)% and PDG 96 values for B lifetime and branching ratio of D^* and D decays.

[50] ABREU 96P result is the average of two methods using exclusive and partial D^* reconstruction.

[51] BARISH 95 use B($D^0 \to K^- \pi^+$) = (3.91 ± 0.08 ± 0.17)% and B($D^{*+} \to D^0 \pi^+$) = (68.1 ± 1.0 ± 1.3)%.

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

[53] ALBRECHT 94 assumes B($D^{*+} \to D^0 \pi^+$) = 68.1 ± 1.0 ± 1.3%. Uses partial reconstruction of D^{*+} and is independent of D^0 branching ratios.

[54] ALBRECHT 93 reports 0.052 ± 0.005 ± 0.006. We rescale using the method described in STONE 94 but with the updated PDG 94 B($D^0 \to K^- \pi^+$). We have taken their average e and μ value. They also obtain $\alpha = 2*\Gamma^0/(\Gamma^- + \Gamma^+) - 1 = 1.1 \pm 0.4 \pm 0.2$, $A_{AF} = 3/4*(\Gamma^- - \Gamma^+)/\Gamma = 0.2 \pm 0.08 \pm 0.06$ and a value of $|V_{cb}|$ = 0.036–0.045 depending on model assumptions.

[55] 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.

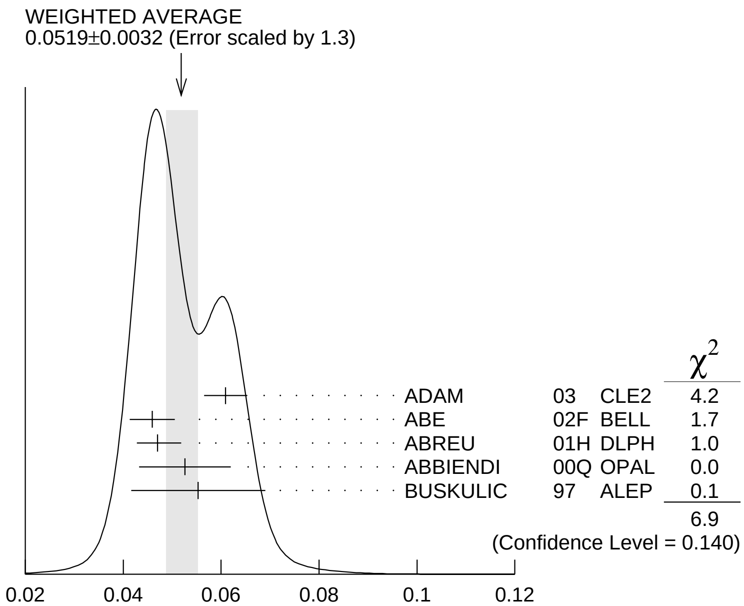
[56] ANTREASYAN 90B is average over B and $\overline{D}^*(2010)$ charge states.

[57] The measurement of ALBRECHT 89C suggests a D^* polarization γ_L/γ_T of 0.85 ± 0.45. or α = 0.7 ± 0.9.

[58] ALBRECHT 89J is ALBRECHT 87J value rescaled using B($D^*(2010)^- \to D^0 \pi^-$) = 0.57 ± 0.04 ± 0.04. Superseded by ALBRECHT 93.

[59] We have taken average of the the BORTOLETTO 89B values for electrons and muons, 0.046 ± 0.005 ± 0.007. We rescale using the method described in STONE 94 but with the updated PDG 94 B($D^0 \to K^- \pi^+$). The measurement suggests a D^* polarization parameter value α = 0.65 ± 0.66 ± 0.25.

[60] ALBRECHT 87J assume μ-e universality, the B($\Upsilon(4S) \to B^0 \overline{B}^0$) = 0.45, the B($D^0 \to K^- \pi^+$) = (0.042 ± 0.004 ± 0.004), and the B($D^*(2010)^- \to D^0 \pi^-$) = 0.49 ± 0.08. Superseded by ALBRECHT 89J.



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

$\Gamma(\rho^- \ell^+ \nu_\ell)/\Gamma_{\text{total}}$ Γ_4/Γ

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

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
$2.57 \pm 0.29 ^{+0.53}_{-0.62}$		[61] BEHRENS	00	CLE2	$e^+ e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$2.69 \pm 0.41 ^{+0.61}_{-0.64}$		[62] BEHRENS	00	CLE2	$e^+ e^- \to \Upsilon(4S)$
$2.5 \pm 0.4 ^{+0.7}_{-0.9}$		[63] ALEXANDER	96T	CLE2	Repl. by BEHRENS 00
<4.1	90	[64] BEAN	93B	CLE2	$e^+ e^- \to \Upsilon(4S)$

[61] Averaging with ALEXANDER 96T results including experimental and theoretical correlations considered, BEHRENS 00 reports systematic errors $^{+0.33}_{-0.46} \pm 0.41$, where the second error is theoretical model dependence. We combine these in quadrature.

[62] BEHRENS 00 reports $^{+0.35}_{-0.40} \pm 0.50$, where the second error is the theoretical model dependence. We combine these in quadrature. B^+ and B^0 decays combined using isospin symmetry: $\Gamma(B^0 \to \rho^- \ell^+ \nu)$=$2\Gamma(B^+ \to \rho^0 \ell^+ \nu) \approx 2\Gamma(B^+ \to \omega \ell^+ \nu)$. No evidence for $\omega \ell \nu$ is reported.

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

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

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

VALUE (units 10^{-4})	DOCUMENT ID	TECN	COMMENT
1.8±0.4±0.4	[65] ALEXANDER 96T	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

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

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

VALUE	DOCUMENT ID	TECN
• • • We do not use the following data for averages, fits, limits, etc. • • •		
seen	[66] ALBRECHT 91C	ARG

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

$\Gamma(K^+ \text{anything})/\Gamma_{\text{total}}$ — Γ_7/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
0.78±0.08	[67] ALBRECHT 96D	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

[67] Average multiplicity.

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

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
0.00276±0.00025 OUR AVERAGE				
0.00268±0.00012±0.00024		[68,69] AHMED 02B	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
0.0027 ±0.0006 ±0.0005		[70] BORTOLETTO 92	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
0.0048 ±0.0011 ±0.0011	22	[71] ALBRECHT 90J	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
0.0051 $^{+0.0028}_{-0.0025}$ $^{+0.0013}_{-0.0012}$	4	[72] BEBEK 87	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.0030 ±0.0004 ±0.0002	81	[73] ALAM 94	CLE2	Repl. by AHMED 02B
0.0031 ±0.0013 ±0.0010	7	[71] ALBRECHT 88K	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

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

[69] AHMED 02B reports an additional uncertainty on the branching ratios to account for 4.5% uncertainty on relative production of B^0 and B^+, which is not included here.

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

[71] ALBRECHT 88K assumes $B^0 \overline{B}^0$:$B^+ B^-$ production ratio is 45:55. Superseded by ALBRECHT 90J which assumes 50:50.

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

[73] ALAM 94 reports $[B(B^0 \rightarrow D^- \pi^+) \times B(D^+ \rightarrow K^- \pi^+ \pi^+)] = 0.000265 \pm 0.000032 \pm 0.000023$. We divide by our best value $B(D^+ \rightarrow K^- \pi^+ \pi^+) = (8.8 \pm 0.6) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

$\Gamma(D^- \rho^+)/\Gamma_{total}$ Γ_9/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.0080±0.0014 OUR AVERAGE					
$0.0080\pm0.0013^{+0.0006}_{-0.0005}$	79	[74] ALAM	94	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
$0.009 \pm0.005 \pm0.003$	9	[75] ALBRECHT	90J	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$0.022 \pm0.012 \pm0.009$	6	[75] ALBRECHT	88K	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

[74] ALAM 94 reports $[B(B^0 \rightarrow D^- \rho^+) \times B(D^+ \rightarrow K^- \pi^+ \pi^+)] = 0.000704 \pm 0.000096 \pm 0.000070$. We divide by our best value $B(D^+ \rightarrow K^- \pi^+ \pi^+) = (8.8 \pm 0.6) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

[75] ALBRECHT 88K assumes $B^0 \overline{B}^0$:$B^+ B^-$ production ratio is 45:55. Superseded by ALBRECHT 90J which assumes 50:50.

$\Gamma(D^- K^*(892)^+)/\Gamma_{total}$ Γ_{10}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
$(3.7\pm1.5\pm1.0) \times 10^{-4}$	[76] MAHAPATRA	02	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

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

$\Gamma(D^- \omega\pi^+)/\Gamma_{total}$ Γ_{11}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
0.0028±0.0005±0.0004	[77] ALEXANDER	01B	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

[77] Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. The signal is consistent with all observed $\omega\pi^+$ having proceeded through the ρ'^+ resonance at mass $1349 \pm 25^{+10}_{-\ 5}$ MeV and width $547 \pm 86^{+46}_{-45}$ MeV.

$\Gamma(D^- K^+)/\Gamma_{total}$ Γ_{12}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
$(2.04\pm0.50\pm0.27) \times 10^{-4}$	[78] ABE	01I	BELL	$e^+e^- \rightarrow \Upsilon(4S)$

[78] ABE 01I reports $B(B^0 \rightarrow D^- K^+)/B(B^0 \rightarrow D^- \pi^+) = 0.068 \pm 0.015 \pm 0.007$. We multiply by our best value $B(B^0 \rightarrow D^- \pi^+) = (3.0 \pm 0.4) \times 10^{-3}$. Our first error is their experiment's error and the second error is systematic error from using our best value.

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

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<3.1	90	[79] DRUTSKOY	02	BELL	$e^+e^- \rightarrow \Upsilon(4S)$

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

$\Gamma(D^- K^+ \overline{K}^*(892)^0)/\Gamma_{total}$ Γ_{14}/Γ

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
8.8±1.1±1.5	[80] DRUTSKOY	02	BELL	$e^+e^- \rightarrow \Upsilon(4S)$

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

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

VALUE (units 10^{-4})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
8.0± 0.6±1.5			[81,82] SATPATHY	03	BELL	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
< 16	90		[81] ALAM	94	CLE2	$e^+e^- \to \Upsilon(4S)$
< 70	90		[83] BORTOLETTO	92	CLEO	$e^+e^- \to \Upsilon(4S)$
<340	90		[84] BEBEK	87	CLEO	$e^+e^- \to \Upsilon(4S)$
700 ±500		5	[85] BEHRENDS	83	CLEO	$e^+e^- \to \Upsilon(4S)$

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

[82] No assumption about the intermediate mechanism is made in the analysis.

[83] 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 $D_0^*(2340) \to D^0\pi$ is < 0.0001 at 90% CL and into $D_2^*(2460)$ followed by $D_2^*(2460) \to D^0\pi$ is < 0.0004 at 90% CL.

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

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

$\Gamma(D^*(2010)^-\pi^+)/\Gamma_{\text{total}}$ — Γ_{16}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.00276±0.00021 OUR AVERAGE					
0.00281±0.00024±0.00005		[86] BRANDENB...	98	CLE2	$e^+e^- \to \Upsilon(4S)$
0.0026 ±0.0003 ±0.0004	82	[87] ALAM	94	CLE2	$e^+e^- \to \Upsilon(4S)$
0.00337±0.00096±0.00002		[88] BORTOLETTO	92	CLEO	$e^+e^- \to \Upsilon(4S)$
0.00236±0.00088±0.00002	12	[89] ALBRECHT	90J	ARG	$e^+e^- \to \Upsilon(4S)$
$0.00236^{+0.00150}_{-0.00110}\pm0.00002$	5	[90] BEBEK	87	CLEO	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.010 ±0.004 ±0.001	8	[91] AKERS	94J	OPAL	$e^+e^- \to Z$
0.0027 ±0.0014 ±0.0010	5	[92] ALBRECHT	87C	ARG	$e^+e^- \to \Upsilon(4S)$
0.0035 ±0.002 ±0.002		[93] ALBRECHT	86F	ARG	$e^+e^- \to \Upsilon(4S)$
0.017 ±0.005 ±0.005	41	[94] GILES	84	CLEO	$e^+e^- \to \Upsilon(4S)$

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

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

[88] BORTOLETTO 92 reports $0.0040 \pm 0.0010 \pm 0.0007$ for $B(D^*(2010)^+ \to D^0\pi^+) = 0.57 \pm 0.06$. We rescale to our best value $B(D^*(2010)^+ \to D^0\pi^+) = (67.7 \pm 0.5) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$ and uses Mark III branching fractions for the D.

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

10^{-2}. Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$ and uses Mark III branching fractions for the D.

[90] BEBEK 87 reports $0.0028^{+0.0015}_{-0.0012}{}^{+0.0010}_{-0.0006}$ for B($D^*(2010)^+ \rightarrow D^0\pi^+$) = 0.57 ± 0.06. We rescale to our best value B($D^*(2010)^+ \rightarrow D^0\pi^+$) = $(67.7 \pm 0.5) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Updated in BERKELMAN 91 to use same assumptions as noted for BORTOLETTO 92 and ALBRECHT 90J.

[91] Assumes B($Z \rightarrow b\overline{b}$) = 0.217 and 38% B_d production fraction.

[92] 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.

[93] ALBRECHT 86F uses pseudomass that is independent of D^0 and D^+ branching ratios.

[94] Assumes B($D^*(2010)^+ \rightarrow D^0\pi^+$) = $0.60^{+0.08}_{-0.15}$. Assumes B($\Upsilon(4S) \rightarrow B^0\overline{B}^0$) = 0.40 ± 0.02 Does not depend on D branching ratios.

$\Gamma(D^-\pi^+\pi^+\pi^-)/\Gamma_{total}$ — Γ_{17}/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
0.0080±0.0021±0.0014	[95] BORTOLETTO92	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

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

$\Gamma((D^-\pi^+\pi^+\pi^-)\text{ nonresonant})/\Gamma_{total}$ — Γ_{18}/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
0.0039±0.0014±0.0013	[96] BORTOLETTO92	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

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

$\Gamma(D^-\pi^+\rho^0)/\Gamma_{total}$ — Γ_{19}/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
0.0011±0.0009±0.0004	[97] BORTOLETTO92	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

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

$\Gamma(D^-a_1(1260)^+)/\Gamma_{total}$ — Γ_{20}/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
0.0060±0.0022±0.0024	[98] BORTOLETTO92	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

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

$\Gamma(D^*(2010)^-\pi^+\pi^0)/\Gamma_{total}$ — Γ_{21}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.0152±0.0052±0.0001	51	[99] ALBRECHT	90J	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.015 ±0.008 ±0.008	8	[100] ALBRECHT	87C	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

[99] ALBRECHT 90J reports $0.018 \pm 0.004 \pm 0.005$ for $B(D^*(2010)^+ \rightarrow D^0\pi^+) = 0.57 \pm 0.06$. We rescale to our best value $B(D^*(2010)^+ \rightarrow D^0\pi^+) = (67.7 \pm 0.5) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$ and uses Mark III branching fractions for the D.

[100] 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.

$\Gamma(D^*(2010)^-\rho^+)/\Gamma_{total}$ $\qquad\qquad$ Γ_{22}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.0073 ±0.0015 OUR AVERAGE					
0.0074 ±0.0010 ±0.0014	76	[101,102] ALAM	94	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
0.0160 ±0.0113 ±0.0001		[103] BORTOLETTO	92	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
0.00589±0.00352±0.00004	19	[104] ALBRECHT	90J	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.081 ±0.029 $^{+0.059}_{-0.024}$	19	[105] CHEN	85	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

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

[102] This decay is nearly completely longitudinally polarized, $\Gamma_L/\Gamma = (93 \pm 5 \pm 5)\%$, as expected from the factorization hypothesis (ROSNER 90). The nonresonant $\pi^+\pi^0$ contribution under the ρ^+ is less than 9% at 90% CL.

[103] BORTOLETTO 92 reports $0.019 \pm 0.008 \pm 0.011$ for $B(D^*(2010)^+ \rightarrow D^0\pi^+) = 0.57 \pm 0.06$. We rescale to our best value $B(D^*(2010)^+ \rightarrow D^0\pi^+) = (67.7 \pm 0.5) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$ and uses Mark III branching fractions for the D.

[104] ALBRECHT 90J reports $0.007 \pm 0.003 \pm 0.003$ for $B(D^*(2010)^+ \rightarrow D^0\pi^+) = 0.57 \pm 0.06$. We rescale to our best value $B(D^*(2010)^+ \rightarrow D^0\pi^+) = (67.7 \pm 0.5) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$ and uses Mark III branching fractions for the D.

[105] Uses $B(D^* \rightarrow D^0\pi^+) = 0.6 \pm 0.15$ and $B(\Upsilon(4S) \rightarrow B^0\overline{B}^0) = 0.4$. Does not depend on D branching ratios.

$\Gamma(D^*(2010)^-K^+)/\Gamma_{total}$ $\qquad\qquad$ Γ_{23}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
(2.04±0.44±0.16) × 10^{-4}	[106] ABE	01I	BELL	$e^+e^- \rightarrow \Upsilon(4S)$

[106] ABE 01I reports $B(B^0 \rightarrow D^*(2010)^-K^+)/B(B^0 \rightarrow D^*(2010)^-\pi^+) = 0.074 \pm 0.015 \pm 0.006$. We multiply by our best value $B(B^0 \rightarrow D^*(2010)^-\pi^+) = (2.76 \pm 0.21) \times 10^{-3}$. Our first error is their experiment's error and the second error is systematic error from using our best value.

$\Gamma(D^*(2010)^-K^*(892)^+)/\Gamma_{total}$ $\qquad\qquad$ Γ_{24}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
(3.8±1.3±0.8) × 10^{-4}	[107] MAHAPATRA	02	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

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

$\Gamma(D^*(2010)^- K^+ \overline{K}^0)/\Gamma_{\text{total}}$ — Γ_{25}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<4.7	90	[108] DRUTSKOY	02	BELL	$e^+e^- \rightarrow \Upsilon(4S)$

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

$\Gamma(D^*(2010)^- K^+ \overline{K}^*(892)^0)/\Gamma_{\text{total}}$ — Γ_{26}/Γ

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
12.9±2.2±2.5	[109] DRUTSKOY	02	BELL	$e^+e^- \rightarrow \Upsilon(4S)$

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

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

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
0.0076±0.0018 OUR AVERAGE Error includes scale factor of 1.4. See the ideogram below.						
0.0063±0.0010±0.0011		49	[110,111] ALAM	94	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
0.0134±0.0036±0.0001			[112] BORTOLETTO	92	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
0.0101±0.0041±0.0001		26	[113] ALBRECHT	90J	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
0.033 ±0.009 ±0.016		27	[114] ALBRECHT	87C	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
<0.042	90		[115] BEBEK	87	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

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

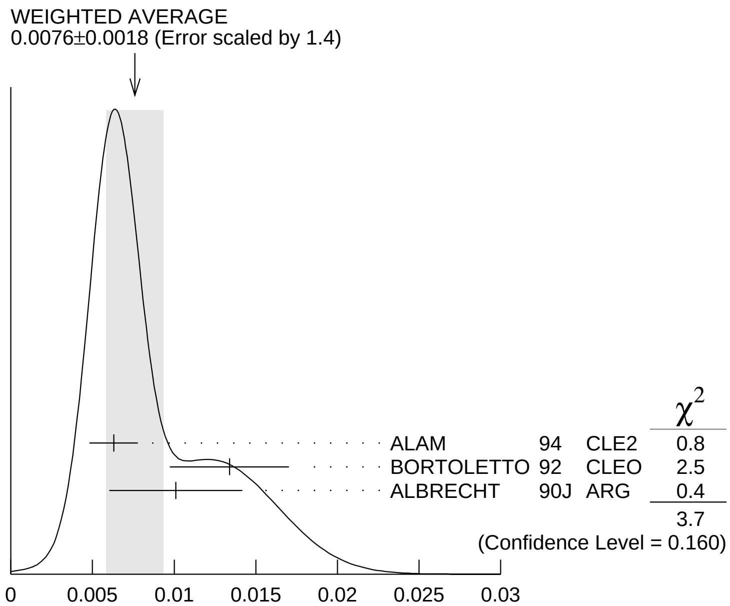
[111] The three pion mass is required to be between 1.0 and 1.6 GeV consistent with an a_1 meson. (If this channel is dominated by a_1^+, the branching ratio for $\overline{D}^{*-} a_1^+$ is twice that for $\overline{D}^{*-}\pi^+\pi^+\pi^-$.)

[112] BORTOLETTO 92 reports $0.0159 \pm 0.0028 \pm 0.0037$ for $B(D^*(2010)^+ \rightarrow D^0\pi^+) = 0.57 \pm 0.06$. We rescale to our best value $B(D^*(2010)^+ \rightarrow D^0\pi^+) = (67.7 \pm 0.5) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$ and uses Mark III branching fractions for the D.

[113] ALBRECHT 90J reports $0.012 \pm 0.003 \pm 0.004$ for $B(D^*(2010)^+ \rightarrow D^0\pi^+) = 0.57 \pm 0.06$. We rescale to our best value $B(D^*(2010)^+ \rightarrow D^0\pi^+) = (67.7 \pm 0.5) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$ and uses Mark III branching fractions for the D.

[114] 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.

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



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

$\Gamma\left((D^*(2010)^-\pi^+\pi^+\pi^-)\ \text{nonresonant}\right)/\Gamma_{\text{total}}$ Γ_{28}/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
0.0000±0.0019±0.0016	[116] BORTOLETTO92	CLEO	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma\left(D^*(2010)^-\pi^+\rho^0\right)/\Gamma_{\text{total}}$ Γ_{29}/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
0.00573±0.00317±0.00004	[117] BORTOLETTO92	CLEO	$e^+e^- \to \Upsilon(4S)$

[117] BORTOLETTO 92 reports $0.0068 \pm 0.0032 \pm 0.0021$ for $B(D^*(2010)^+ \to D^0\pi^+) = 0.57 \pm 0.06$. We rescale to our best value $B(D^*(2010)^+ \to D^0\pi^+) = (67.7 \pm 0.5) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$ and uses Mark III branching fractions for the D.

$\Gamma\left(D^*(2010)^-a_1(1260)^+\right)/\Gamma_{\text{total}}$ Γ_{30}/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
0.0130±0.0027 OUR AVERAGE			
0.0126±0.0020±0.0022	[118,119] ALAM 94	CLE2	$e^+e^- \to \Upsilon(4S)$
0.0152±0.0070±0.0001	[120] BORTOLETTO92	CLEO	$e^+e^- \to \Upsilon(4S)$

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

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

[120] BORTOLETTO 92 reports $0.018 \pm 0.006 \pm 0.006$ for $B(D^*(2010)^+ \to D^0\pi^+) = 0.57 \pm 0.06$. We rescale to our best value $B(D^*(2010)^+ \to D^0\pi^+) = (67.7 \pm 0.5) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$ and uses Mark III branching fractions for the D.

$\Gamma\left(D^*(2010)^- \pi^+\pi^+\pi^-\pi^0\right)/\Gamma_{\text{total}}$ $\qquad$ Γ_{31}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.0176±0.0027 OUR AVERAGE					
0.0172±0.0014±0.0024		[121] ALEXANDER	01B	CLE2	$e^+e^- \to \Upsilon(4S)$
0.0345±0.0181±0.0003	28	[122] ALBRECHT	90J	ARG	$e^+e^- \to \Upsilon(4S)$

[121] Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. The signal is consistent with all observed $\omega\pi^+$ having proceeded through the ρ'^+ resonance at mass $1349 \pm 25^{+10}_{-\ 5}$ MeV and width $547 \pm 86^{+46}_{-45}$ MeV.

[122] ALBRECHT 90J reports $0.041 \pm 0.015 \pm 0.016$ for $B(D^*(2010)^+ \to D^0\pi^+) = 0.57 \pm 0.06$. We rescale to our best value $B(D^*(2010)^+ \to D^0\pi^+) = (67.7 \pm 0.5) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$ and uses Mark III branching fractions for the D.

$\Gamma\left(D^*(2010)^- p\overline{p}\pi^+\right)/\Gamma_{\text{total}}$ $\qquad$ Γ_{33}/Γ

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
$\mathbf{6.5^{+1.3}_{-1.2}\pm1.0}$	[123] ANDERSON	01	CLE2	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma\left(D^*(2010)^- p\overline{n}\right)/\Gamma_{\text{total}}$ $\qquad$ Γ_{34}/Γ

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
$\mathbf{14.5^{+3.4}_{-3.0}\pm2.7}$	[124] ANDERSON	01	CLE2	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma\left(\overline{D}^*(2010)^- \omega\pi^+\right)/\Gamma_{\text{total}}$ $\qquad$ Γ_{35}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
0.0029±0.0003±0.0004	[125] ALEXANDER	01B	CLE2	$e^+e^- \to \Upsilon(4S)$

[125] Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. The signal is consistent with all observed $\omega\pi^+$ having proceeded through the ρ'^+ resonance at mass $1349 \pm 25^{+10}_{-\ 5}$ MeV and width $547 \pm 86^{+46}_{-45}$ MeV.

$\Gamma\left(\overline{D}^*_2(2460)^- \pi^+\right)/\Gamma_{\text{total}}$ $\qquad$ Γ_{36}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0022	90	[126] ALAM	94	CLE2	$e^+e^- \to \Upsilon(4S)$

[126] ALAM 94 assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$ and use the CLEO II absolute $B(D^0 \to K^-\pi^+)$ and $B(D^*_2(2460)^+ \to D^0\pi^+) = 30\%$.

$\Gamma(\overline{D}^*_2(2460)^- \rho^+)/\Gamma_{total}$ Γ_{37}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0049	90	[127] ALAM	94	CLE2	$e^+ e^- \to \Upsilon(4S)$

[127] ALAM 94 assumesequal production of B^+ and B^0 at the $\Upsilon(4S)$ and use the CLEO II absolute B($D^0 \to K^- \pi^+$) and B($D^*_2(2460)^+ \to D^0 \pi^+$) = 30%.

$\Gamma(D^- D^+)/\Gamma_{total}$ Γ_{38}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<9.4 × 10^−4	90	[128] LIPELES	00	CLE2	$e^+ e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<5.9 \times 10^{-3}$	90	BARATE	98Q	ALEP	$e^+ e^- \to Z$
$<1.2 \times 10^{-3}$	90	ASNER	97	CLE2	$e^+ e^- \to \Upsilon(4S)$

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

$\Gamma(D^- D^+_s)/\Gamma_{total}$ Γ_{39}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.0080±0.0030 OUR AVERAGE					
$0.0084 \pm 0.0030 ^{+0.0020}_{-0.0021}$		[129] GIBAUT	96	CLE2	$e^+ e^- \to \Upsilon(4S)$
$0.013 \pm 0.011 \pm 0.003$		[130] ALBRECHT	92G	ARG	$e^+ e^- \to \Upsilon(4S)$
$0.007 \pm 0.004 \pm 0.002$		[131] BORTOLETTO	92	CLEO	$e^+ e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.012 ± 0.007	3	[132] BORTOLETTO	90	CLEO	$e^+ e^- \to \Upsilon(4S)$

[129] GIBAUT 96 reports $0.0087 \pm 0.0024 \pm 0.0020$ 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.

[130] ALBRECHT 92G reports $0.017 \pm 0.013 \pm 0.006$ 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^+ branching ratios, e.g., B($D^+ \to K^- \pi^+ \pi^+$) = 7.7 ± 1.0%.

[131] BORTOLETTO 92 reports $0.0080 \pm 0.0045 \pm 0.0030$ for B($D^+_s \to \phi\pi^+$) = 0.030 ± 0.011. 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 equal production of B^+ and B^0 at the $\Upsilon(4S)$ and uses Mark III branching fractions for the D.

[132] BORTOLETTO 90 assume B($D_s \to \phi\pi^+$) = 2%. Superseded by BORTOLETTO 92.

$\Gamma(D^*(2010)^- D^+_s)/\Gamma_{total}$ Γ_{40}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.0111±0.0033 OUR AVERAGE					
$0.0110 \pm 0.0021 ^{+0.0026}_{-0.0027}$		[133] AHMED	00B	CLE2	$e^+ e^- \to \Upsilon(4S)$
$0.010 \pm 0.008 \pm 0.003$		[134] ALBRECHT	92G	ARG	$e^+ e^- \to \Upsilon(4S)$
$0.013 \pm 0.008 \pm 0.003$		[135] BORTOLETTO	92	CLEO	$e^+ e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$0.0090 \pm 0.0027 \pm 0.0022$		[136] GIBAUT	96	CLE2	Repl. by AHMED 00B
0.024 ± 0.014	3	[137] BORTOLETTO	90	CLEO	$e^+ e^- \to \Upsilon(4S)$

[133] AHMED 00B reports $0.0110 \pm 0.0018 \pm 0.0011$ for $B(D_s^+ \rightarrow \phi\pi^+) = 0.036$. 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.

[134] ALBRECHT 92G reports $0.014 \pm 0.010 \pm 0.003$ for $B(D_s^+ \rightarrow \phi\pi^+) = 0.027$. We rescale to our best value $B(D_s^+ \rightarrow \phi\pi^+) = (3.6 \pm 0.9) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes PDG 1990 D^+ and $D^*(2010)^+$ branching ratios, e.g., $B(D^0 \rightarrow K^-\pi^+) = 3.71 \pm 0.25\%$, $B(D^+ \rightarrow K^-\pi^+\pi^+) = 7.1 \pm 1.0\%$, and $B(D^*(2010)^+ \rightarrow D^0\pi^+) = 55 \pm 4\%$.

[135] BORTOLETTO 92 reports $0.016 \pm 0.009 \pm 0.006$ for $B(D_s^+ \rightarrow \phi\pi^+) = 0.030 \pm 0.011$. 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 equal production of B^+ and B^0 at the $\Upsilon(4S)$ and uses Mark III branching fractions for the D and $D^*(2010)$.

[136] GIBAUT 96 reports $0.0093 \pm 0.0023 \pm 0.0016$ 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.

[137] BORTOLETTO 90 assume $B(D_s \rightarrow \phi\pi^+) = 2\%$. Superseded by BORTOLETTO 92.

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

VALUE	DOCUMENT ID		TECN	COMMENT
0.010±0.005 OUR AVERAGE				
0.010±0.004±0.002	[138] GIBAUT	96	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
0.020±0.014±0.005	[139] ALBRECHT	92G	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

[138] GIBAUT 96 reports $0.0100 \pm 0.0035 \pm 0.0022$ 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.

[139] ALBRECHT 92G reports $0.027 \pm 0.017 \pm 0.009$ 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^+ branching ratios, e.g., $B(D^+ \rightarrow K^-\pi^+\pi^+) = 7.7 \pm 1.0\%$.

$\left[\Gamma(D^*(2010)^- D_s^+) + \Gamma(D^*(2010)^- D_s^{*+})\right]/\Gamma_{\text{total}}$ $(\Gamma_{40}+\Gamma_{42})/\Gamma$

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
4.1±1.1±1.0	22	[140] BORTOLETTO	90	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

[140] BORTOLETTO 90 reports 7.5 ± 2.0 for $B(D_s^+ \rightarrow \phi\pi^+) = 0.02$. 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.

$\Gamma(D^*(2010)^- D_s^{*+})/\Gamma_{\text{total}}$ Γ_{42}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
0.018±0.006 OUR AVERAGE				
0.018±0.004±0.004	[141] AHMED	00B	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
0.019±0.011±0.005	[142] ALBRECHT	92G	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.020±0.006±0.005	[143] GIBAUT	96	CLE2	Repl. by AHMED 00B

[141] AHMED 00B reports $0.0182 \pm 0.0037 \pm 0.0025$ for $B(D_s^+ \to \phi\pi^+) = 0.036$. 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.

[142] ALBRECHT 92G reports $0.026 \pm 0.014 \pm 0.006$ 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^+ and $D^*(2010)^+$ branching ratios, e.g., $B(D^0 \to K^-\pi^+) = 3.71 \pm 0.25\%$, $B(D^+ \to K^-\pi^+\pi^+) = 7.1 \pm 1.0\%$, and $B(D^*(2010)^+ \to D^0\pi^+) = 55 \pm 4\%$.

[143] GIBAUT 96 reports $0.0203 \pm 0.0050 \pm 0.0036$ 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.

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

VALUE (units 10^{-6})	CL%	DOCUMENT ID		TECN	COMMENT
27±10 OUR AVERAGE					
$31. \pm 11. ^{+7.}_{-8.}$		[144] AUBERT	03D	BABR	$e^+e^- \to \Upsilon(4S)$
$24. ^{+11.}_{-9.} \pm 6.$		[145] KROKOVNY	02	BELL	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<280	90	[146] ALEXANDER	93B	CLE2	$e^+e^- \to \Upsilon(4S)$
<1300	90	[147] BORTOLETTO	90	CLEO	$e^+e^- \to \Upsilon(4S)$

[144] AUBERT 03D reports $[B(B^0 \to D_s^+\pi^-) \times B(D_s^+ \to \phi\pi^+)] = 1.13 \pm 0.33 \pm 0.21$. We divide by our best value $B(D_s^+ \to \phi\pi^+) = (3.6 \pm 0.9) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[145] KROKOVNY 02 reports $[B(B^0 \to D_s^+\pi^-) \times B(D_s^+ \to \phi\pi^+)] = 0.86^{+0.37}_{-0.30} \pm 0.11$. We divide by our best value $B(D_s^+ \to \phi\pi^+) = (3.6 \pm 0.9) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[146] ALEXANDER 93B reports < 270 for $B(D_s^+ \to \phi\pi^+) = 0.037$. We rescale to our best value $B(D_s^+ \to \phi\pi^+) = 0.036$.

[147] BORTOLETTO 90 assume $B(D_s \to \phi\pi^+) = 2\%$.

$\left[\Gamma(D_s^+\pi^-) + \Gamma(D_s^- K^+)\right]/\Gamma_{total}$ — $(\Gamma_{43}+\Gamma_{49})/\Gamma$

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0013	90	[148] ALBRECHT	93E	ARG	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma(D_s^{*+}\pi^-)/\Gamma_{total}$ — Γ_{44}/Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID		TECN	COMMENT
< 4.1	90	AUBERT	03D	BABR	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<50	90	[149] ALEXANDER	93B	CLE2	$e^+e^- \to \Upsilon(4S)$

[149] ALEXANDER 93B reports < 44 for B($D_s^+ \rightarrow \phi\pi^+$) = 0.037. We rescale to our best value B($D_s^+ \rightarrow \phi\pi^+$) = 0.036.

$\left[\Gamma(D_s^{*+}\pi^-) + \Gamma(D_s^{*-}K^+)\right]/\Gamma_{total}$ — $(\Gamma_{44}+\Gamma_{50})/\Gamma$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0009	90	[150] ALBRECHT 93E	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

[150] ALBRECHT 93E reports $< 1.2 \times 10^{-3}$ for B($D_s^+ \rightarrow \phi\pi^+$) = 0.027. We rescale to our best value B($D_s^+ \rightarrow \phi\pi^+$) = 0.036.

$\Gamma(D_s^+\rho^-)/\Gamma_{total}$ — Γ_{45}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0007	90	[151] ALEXANDER 93B	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<0.0016	90	[152] ALBRECHT 93E	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

[151] ALEXANDER 93B reports $< 6.6 \times 10^{-4}$ for B($D_s^+ \rightarrow \phi\pi^+$) = 0.037. We rescale to our best value B($D_s^+ \rightarrow \phi\pi^+$) = 0.036.

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

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

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0008	90	[153] ALEXANDER 93B	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<0.0019	90	[154] ALBRECHT 93E	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

[153] ALEXANDER 93B reports $< 7.4 \times 10^{-4}$ for B($D_s^+ \rightarrow \phi\pi^+$) = 0.037. We rescale to our best value B($D_s^+ \rightarrow \phi\pi^+$) = 0.036.

[154] 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.

$\Gamma(D_s^+ a_1(1260)^-)/\Gamma_{total}$ — Γ_{47}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0026	90	[155] ALBRECHT 93E	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

[155] ALBRECHT 93E reports $< 3.5 \times 10^{-3}$ for B($D_s^+ \rightarrow \phi\pi^+$) = 0.027. We rescale to our best value B($D_s^+ \rightarrow \phi\pi^+$) = 0.036.

$\Gamma(D_s^{*+} a_1(1260)^-)/\Gamma_{total}$ — Γ_{48}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.0022	90	[156] ALBRECHT 93E	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

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

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

VALUE (units 10^{-6})	CL%	DOCUMENT ID		TECN	COMMENT
38±13 OUR AVERAGE					
$32.\pm 12.\pm 8.$		[157] AUBERT	03D	BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$45.^{+14.}_{-12.}\pm 11.$		[158] KROKOVNY	02	BELL	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<240	90	[159] ALEXANDER	93B	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
<1300	90	[160] BORTOLETTO	90	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

[157] AUBERT 03D reports $[B(B^0 \rightarrow D_s^- K^+) \times B(D_s^+ \rightarrow \phi\pi^+)] = 1.16 \pm 0.36 \pm 0.24$. We divide by our best value $B(D_s^+ \rightarrow \phi\pi^+) = (3.6 \pm 0.9) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[158] KROKOVNY 02 reports $[B(B^0 \rightarrow D_s^- K^+) \times B(D_s^+ \rightarrow \phi\pi^+)] = 1.61^{+0.45}_{-0.38} \pm 0.21$. We divide by our best value $B(D_s^+ \rightarrow \phi\pi^+) = (3.6 \pm 0.9) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[159] ALEXANDER 93B reports < 230 for $B(D_s^+ \rightarrow \phi\pi^+) = 0.037$. We rescale to our best value $B(D_s^+ \rightarrow \phi\pi^+) = 0.036$.

[160] BORTOLETTO 90 assume $B(D_s \rightarrow \phi\pi^+) = 2\%$.

$\Gamma(D_s^{*-} K^+)/\Gamma_{total}$ — Γ_{50}/Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID		TECN	COMMENT
< 2.5	90	AUBERT	03D	BABR	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<17	90	[161] ALEXANDER	93B	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

[161] ALEXANDER 93B reports < 17 for $B(D_s^+ \rightarrow \phi\pi^+) = 0.037$. We rescale to our best value $B(D_s^+ \rightarrow \phi\pi^+) = 0.036$.

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0010	90	[162] ALEXANDER	93B	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.0034	90	[163] ALBRECHT	93E	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

[162] ALEXANDER 93B reports $< 9.7 \times 10^{-4}$ for $B(D_s^+ \rightarrow \phi\pi^+) = 0.037$. We rescale to our best value $B(D_s^+ \rightarrow \phi\pi^+) = 0.036$.

[163] ALBRECHT 93E reports $< 4.6 \times 10^{-3}$ for $B(D_s^+ \rightarrow \phi\pi^+) = 0.027$. We rescale to our best value $B(D_s^+ \rightarrow \phi\pi^+) = 0.036$.

$\Gamma(D_s^{*-} K^*(892)^+)/\Gamma_{total}$ — Γ_{52}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0011	90	[164] ALEXANDER	93B	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.004	90	[165] ALBRECHT	93E	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

[164] ALEXANDER 93B reports $< 11.0 \times 10^{-4}$ for B($D_s^+ \to \phi\pi^+$) = 0.037. We rescale to our best value B($D_s^+ \to \phi\pi^+$) = 0.036.

[165] ALBRECHT 93E reports $< 5.8 \times 10^{-3}$ for B($D_s^+ \to \phi\pi^+$) = 0.027. We rescale to our best value B($D_s^+ \to \phi\pi^+$) = 0.036.

$\Gamma(D_s^- \pi^+ K^0)/\Gamma_{total}$ — Γ_{53}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.005	90	[166] ALBRECHT	93E	ARG	$e^+e^- \to \Upsilon(4S)$

[166] ALBRECHT 93E reports $< 7.3 \times 10^{-3}$ for B($D_s^+ \to \phi\pi^+$) = 0.027. We rescale to our best value B($D_s^+ \to \phi\pi^+$) = 0.036.

$\Gamma(D_s^{*-} \pi^+ K^0)/\Gamma_{total}$ — Γ_{54}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0031	90	[167] ALBRECHT	93E	ARG	$e^+e^- \to \Upsilon(4S)$

[167] ALBRECHT 93E reports $< 4.2 \times 10^{-3}$ for B($D_s^+ \to \phi\pi^+$) = 0.027. We rescale to our best value B($D_s^+ \to \phi\pi^+$) = 0.036.

$\Gamma(D_s^- \pi^+ K^*(892)^0)/\Gamma_{total}$ — Γ_{55}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.004	90	[168] ALBRECHT	93E	ARG	$e^+e^- \to \Upsilon(4S)$

[168] ALBRECHT 93E reports $< 5.0 \times 10^{-3}$ for B($D_s^+ \to \phi\pi^+$) = 0.027. We rescale to our best value B($D_s^+ \to \phi\pi^+$) = 0.036.

$\Gamma(D_s^{*-} \pi^+ K^*(892)^0)/\Gamma_{total}$ — Γ_{56}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0020	90	[169] ALBRECHT	93E	ARG	$e^+e^- \to \Upsilon(4S)$

[169] ALBRECHT 93E reports $< 2.7 \times 10^{-3}$ for B($D_s^+ \to \phi\pi^+$) = 0.027. We rescale to our best value B($D_s^+ \to \phi\pi^+$) = 0.036.

$\Gamma(\overline{D}^0 K^0)/\Gamma_{total}$ — Γ_{57}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
$\mathbf{(5.0^{+1.3}_{-1.2} \pm 0.6) \times 10^{-5}}$	[170] KROKOVNY	03	BELL	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma(\overline{D}^0 K^*(892)^0)/\Gamma_{total}$ — Γ_{58}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
$\mathbf{(4.8^{+1.1}_{-1.0} \pm 0.5) \times 10^{-5}}$	[171] KROKOVNY	03	BELL	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma(\overline{D}^0\pi^0)/\Gamma_{\rm total}$ Γ_{59}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
2.9 $\pm$0.5 OUR AVERAGE					
3.1 $\pm$0.4 $\pm$0.5		[172] ABE	02J	BELL	$e^+e^- \rightarrow \Upsilon(4S)$
$2.74^{+0.36}_{-0.32}\pm0.55$		[172] COAN	02	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<1.2	90	[173] NEMATI	98	CLE2	Repl. by COAN 02
<4.8	90	[174] ALAM	94	CLE2	Repl. by NEMATI 98

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

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

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

$\Gamma(\overline{D}^0\rho^0)/\Gamma_{\rm total}$ Γ_{60}/Γ

VALUE (units 10^{-4})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
2.9$\pm$1.0$\pm$0.4			[175] SATPATHY	03	BELL	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
< 3.9	90		[176] NEMATI	98	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
< 5.5	90		[177] ALAM	94	CLE2	Repl. by NEMATI 98
< 6.0	90		[178] BORTOLETTO	92	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
<27.0	90	4	[179] ALBRECHT	88K	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

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

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

[177] 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($D^0 \rightarrow K^-\pi^+$).

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

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

$\Gamma(\overline{D}^0\eta)/\Gamma_{\rm total}$ Γ_{61}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
$1.4^{+0.5}_{-0.4}\pm0.3$		[180] ABE	02J	BELL	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<1.3	90	[181] NEMATI	98	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
<6.8	90	[182] ALAM	94	CLE2	Repl. by NEMATI 98

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

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

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

$\Gamma(\overline{D}^0\eta')/\Gamma_{\text{total}}$ — Γ_{62}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.00094	90	[183] NEMATI	98	CLE2	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.00086	90	[184] ALAM	94	CLE2	Repl. by NEMATI 98

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

[184] 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($D^0 \to K^-\pi^+$).

$\Gamma(\overline{D}^0\omega)/\Gamma_{\text{total}}$ — Γ_{63}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
$\mathbf{1.8 \pm 0.5^{+0.4}_{-0.3}}$		[185] ABE	02J	BELL	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<5.1	90	[186] NEMATI	98	CLE2	$e^+e^- \to \Upsilon(4S)$
<6.3	90	[187] ALAM	94	CLE2	Repl. by NEMATI 98

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

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

[187] 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($D^0 \to K^-\pi^+$).

$\Gamma(D^0 K^*(892)^0)/\Gamma_{\text{total}}$ — Γ_{64}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$\mathbf{<1.8 \times 10^{-5}}$	90	[188] KROKOVNY	03	BELL	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma(\overline{D}^{*0}\gamma)/\Gamma_{\text{total}}$ — Γ_{65}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$\mathbf{<5.0 \times 10^{-5}}$	90	[189] ARTUSO	00	CLE2	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma(\overline{D}^*(2007)^0\pi^0)/\Gamma_{\text{total}}$ — Γ_{66}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
2.5 ±0.7 OUR AVERAGE					
$2.7\ ^{+0.8}_{-0.7}\ ^{+0.5}_{-0.6}$		[190] ABE	02J	BELL	$e^+e^- \to \Upsilon(4S)$
$2.20^{+0.59}_{-0.52} \pm 0.79$		[190] COAN	02	CLE2	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<4.4	90	[191] NEMATI	98	CLE2	Repl. by COAN 02
<9.7	90	[192] ALAM	94	CLE2	Repl. by NEMATI 98

[190] Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.
[191] NEMATI 98 assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$ and use the PDG 96 values for D^0, D^{*0}, η, η', and ω branching fractions.
[192] ALAM 94 assume equal production of B^+ and B^0 at the $\Upsilon(4S)$ and use the CLEO II B($D^*(2007)^0 \rightarrow D^0\pi^0$) and absolute B($D^0 \rightarrow K^-\pi^+$) and the PDG 1992 B($D^0 \rightarrow K^-\pi^+\pi^0$)/B($D^0 \rightarrow K^-\pi^+$) and B($D^0 \rightarrow K^-\pi^+\pi^+\pi^-$)/B($D^0 \rightarrow K^-\pi^+$).

$\Gamma(\overline{D}^*(2007)^0\rho^0)/\Gamma_{total}$ Γ_{67}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<5.1 × 10^{-4}	90	[193] SATPATHY	03	BELL	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.00056	90	[194] NEMATI	98	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
<0.00117	90	[195] ALAM	94	CLE2	Repl. by NEMATI 98

[193] Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.
[194] NEMATI 98 assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$ and use the PDG 96 values for D^0, D^{*0}, η, η', and ω branching fractions.
[195] ALAM 94 assume equal production of B^+ and B^0 at the $\Upsilon(4S)$ and use the CLEO II B($D^*(2007)^0 \rightarrow D^0\pi^0$) and absolute B($D^0 \rightarrow K^-\pi^+$) and the PDG 1992 B($D^0 \rightarrow K^-\pi^+\pi^0$)/B($D^0 \rightarrow K^-\pi^+$) and B($D^0 \rightarrow K^-\pi^+\pi^+\pi^-$)/B($D^0 \rightarrow K^-\pi^+$).

$\Gamma(\overline{D}^*(2007)^0\eta)/\Gamma_{total}$ Γ_{68}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.00026	90	[196] NEMATI	98	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.00046	90	[197] ABE	02J	BELL	$e^+e^- \rightarrow \Upsilon(4S)$
<0.00069	90	[198] ALAM	94	CLE2	Repl. by NEMATI 98

[196] NEMATI 98 assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$ and use the PDG 96 values for D^0, D^{*0}, η, η', and ω branching fractions.
[197] Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.
[198] ALAM 94 assume equal production of B^+ and B^0 at the $\Upsilon(4S)$ and use the CLEO II B($D^*(2007)^0 \rightarrow D^0\pi^0$) and absolute B($D^0 \rightarrow K^-\pi^+$) and the PDG 1992 B($D^0 \rightarrow K^-\pi^+\pi^0$)/B($D^0 \rightarrow K^-\pi^+$) and B($D^0 \rightarrow K^-\pi^+\pi^+\pi^-$)/B($D^0 \rightarrow K^-\pi^+$).

$\Gamma(\overline{D}^*(2007)^0\eta')/\Gamma_{total}$ Γ_{69}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0014	90	BRANDENB...	98	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.0019	90	[199] NEMATI	98	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
<0.0027	90	[200] ALAM	94	CLE2	Repl. by NEMATI 98

[199] NEMATI 98 assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$ and use the PDG 96 values for D^0, D^{*0}, η, η', and ω branching fractions.
[200] ALAM 94 assume equal production of B^+ and B^0 at the $\Upsilon(4S)$ and use the CLEO II B($D^*(2007)^0 \rightarrow D^0\pi^0$) and absolute B($D^0 \rightarrow K^-\pi^+$) and the PDG 1992 B($D^0 \rightarrow K^-\pi^+\pi^0$)/B($D^0 \rightarrow K^-\pi^+$) and B($D^0 \rightarrow K^-\pi^+\pi^+\pi^-$)/B($D^0 \rightarrow K^-\pi^+$).

$\Gamma(\overline{D}^*(2007)^0 \omega)/\Gamma_{\text{total}}$ Γ_{70}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.00074	90	[201] NEMATI	98	CLE2	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.00079	90	[202] ABE	02J	BELL	$e^+e^- \to \Upsilon(4S)$
<0.0021	90	[203] ALAM	94	CLE2	Repl. by NEMATI 98

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

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

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

$\Gamma(\overline{D}^*(2007)^0 \pi^+\pi^-)/\Gamma_{\text{total}}$ Γ_{71}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
$(6.2\pm1.2\pm1.8) \times 10^{-4}$	[204,205] SATPATHY	03	BELL	$e^+e^- \to \Upsilon(4S)$

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

[205] No assumption about the intermediate mechanism is made in the analysis.

$\Gamma(\overline{D}^*(2007)^0 K^0)/\Gamma_{\text{total}}$ Γ_{72}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<6.6 \times 10^{-5}$	90	[206] KROKOVNY	03	BELL	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma(\overline{D}^*(2007)^0 K^*(892)^0)/\Gamma_{\text{total}}$ Γ_{73}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<6.9 \times 10^{-5}$	90	[207] KROKOVNY	03	BELL	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma(D^*(2007)^0 K^*(892)^0)/\Gamma_{\text{total}}$ Γ_{74}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<4.0 \times 10^{-5}$	90	[208] KROKOVNY	03	BELL	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma(D^*(2007)^0 \pi^+\pi^+\pi^-\pi^-)/\Gamma_{\text{total}}$ Γ_{75}/Γ

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
$3.0\pm0.7\pm0.6$	[209] EDWARDS	02	CLE2	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma(D^*(2007)^0 \pi^+\pi^+\pi^-\pi^-)/\Gamma(D^*(2010)^+ \pi^+\pi^-\pi^-\pi^0)$ Γ_{75}/Γ_{32}

VALUE	DOCUMENT ID		TECN	COMMENT
$0.17\pm0.04\pm0.02$	[210] EDWARDS	02	CLE2	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma(D^*(2010)^+ D^*(2010)^-)/\Gamma_{\text{total}}$ Γ_{76}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
(8.7±1.8) × 10^−4 OUR AVERAGE				
$(8.3\pm1.6\pm1.2)\times10^{-4}$		[211,212] AUBERT 02M	BABR	$e^+e^- \to \Upsilon(4S)$
$(9.9^{+4.2}_{-3.3}\pm1.2)\times10^{-4}$		[211] LIPELES 00	CLE2	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$(6.2^{+4.0}_{-2.9}\pm1.0)\times10^{-4}$		[213] ARTUSO 99	CLE2	Repl. by LIPELES 00
$<6.1\times10^{-3}$	90	[214] BARATE 98Q	ALEP	$e^+e^- \to Z$
$<2.2\times10^{-3}$	90	[215] ASNER 97	CLE2	Repl. by ARTUSO 99

[211] Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.
[212] AUBERT 02M also assumes the measured CP-odd fraction of the final states is $0.22 \pm 0.18 \pm 0.03$.
[213] ARTUSO 99 uses $B(\Upsilon(4S) \to B^0\overline{B}^0)=(48 \pm 4)\%$.
[214] BARATE 98Q (ALEPH) observes 2 events with an expected background of 0.10 ± 0.03 which corresponds to a branching ratio of $(2.3^{+1.9}_{-1.2} \pm 0.4)\times10^{-3}$.
[215] ASNER 97 at CLEO observes 1 event with an expected background of 0.022 ± 0.011. This correcsponds to a branching ratio of $(5.3^{+7.1}_{-3.7} \pm 1.0)\times10^{-4}$.

$\Gamma(D^*(2010)^+ D^-)/\Gamma_{\text{total}}$ Γ_{77}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<6.3\times10^{-4}$	90	[216] LIPELES 00	CLE2	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$<5.6\times10^{-3}$	90	BARATE 98Q	ALEP	$e^+e^- \to Z$
$<1.8\times10^{-3}$	90	ASNER 97	CLE2	$e^+e^- \to \Upsilon(4S)$

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

$[\Gamma(D^*(2010)^- D^+) + \Gamma(D^*(2010)^+ D^-)]/\Gamma_{\text{total}}$ Γ_{78}/Γ

VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
$1.17\pm0.26^{+0.22}_{-0.25}$	[217,218] ABE 02Q	BELL	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
$1.48\pm0.38^{+0.28}_{-0.31}$	[217,219] ABE 02Q	BELL	$e^+e^- \to \Upsilon(4S)$

[217] Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.
[218] The measurement is performed using fully reconstructed D^* and D^+ decays.
[219] The measurement is performed using a partial reconstruction technique for the D^* and fully reconstructed D^+ decays as a cross check.

$\Gamma(D^{(*)0}\overline{D}^{(*)0})/\Gamma_{\text{total}}$ Γ_{79}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.027	90	BARATE 98Q	ALEP	$e^+e^- \to Z$

$\Gamma(\eta_c K^0)/\Gamma_{total}$ — Γ_{80}/Γ

VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
1.2 ±0.4 OUR AVERAGE			
$1.23\pm0.23^{+0.40}_{-0.41}$	[220] FANG 03	BELL	$e^+e^- \to \Upsilon(4S)$
$1.09^{+0.55}_{-0.42}\pm0.33$	[221] EDWARDS 01	CLE2	$e^+e^- \to \Upsilon(4S)$

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

[221] EDWARDS 01 assumes equal production of B^0 and B^+ at the $\Upsilon(4S)$. The correlated uncertainties (28.3)% from B($J/\psi(1S) \to \gamma\eta_c$) in those modes have been accounted for.

$\Gamma(\eta_c K^*(892)^0)/\Gamma_{total}$ — Γ_{81}/Γ

VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
$\mathbf{1.62\pm0.32^{+0.55}_{-0.60}}$	[222] FANG 03	BELL	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma(\eta_c K^*(892)^0)/\Gamma(\eta_c K^0)$ — Γ_{81}/Γ_{80}

VALUE	DOCUMENT ID	TECN	COMMENT
$\mathbf{1.33\pm0.36^{+0.24}_{-0.33}}$	FANG 03	BELL	$e^+e^- \to \Upsilon(4S)$

$\Gamma(J/\psi(1S)K^0)/\Gamma_{total}$ — Γ_{82}/Γ

VALUE (units 10^{-4})	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
8.5±0.5 OUR AVERAGE					
7.9±0.4±0.9			[223] ABE 03B	BELL	$e^+e^- \to \Upsilon(4S)$
8.3±0.4±0.5			[223] AUBERT 02	BABR	$e^+e^- \to \Upsilon(4S)$
9.5±0.8±0.6			[223] AVERY 00	CLE2	$e^+e^- \to \Upsilon(4S)$
11.5±2.3±1.7			[224] ABE 96H	CDF	$p\overline{p}$ at 1.8 TeV
7.0±4.1±0.1			[225] BORTOLETTO 92	CLEO	$e^+e^- \to \Upsilon(4S)$
9.3±7.3±0.2		2	[226] ALBRECHT 90J	ARG	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$8.5^{+1.4}_{-1.2}\pm0.6$			[223] JESSOP 97	CLE2	Repl. by AVERY 00
7.5±2.4±0.8		10	[225] ALAM 94	CLE2	Sup. by JESSOP 97
<50	90		ALAM 86	CLEO	$e^+e^- \to \Upsilon(4S)$

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

[224] ABE 96H assumes that B($B^+ \to J/\psi K^+$) = $(1.02 \pm 0.14) \times 10^{-3}$.

[225] BORTOLETTO 92 reports $6 \pm 3 \pm 2$ for B($J/\psi(1S) \to e^+e^-$) = 0.069 ± 0.009. We rescale to our best value B($J/\psi(1S) \to e^+e^-$) = $(5.93 \pm 0.10) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

[226] ALBRECHT 90J reports $8 \pm 6 \pm 2$ for B($J/\psi(1S) \to e^+e^-$) = 0.069 ± 0.009. We rescale to our best value B($J/\psi(1S) \to e^+e^-$) = $(5.93 \pm 0.10) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

$\Gamma(J/\psi(1S)K^+\pi^-)/\Gamma_{total}$ — Γ_{83}/Γ

VALUE (units 10^{-3})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
1.16±0.56±0.02			[227] BORTOLETTO	92	CLEO	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<1.3	90		[228] ALBRECHT	87D	ARG	$e^+e^- \to \Upsilon(4S)$
<6.3	90	2	GILES	84	CLEO	$e^+e^- \to \Upsilon(4S)$

[227] BORTOLETTO 92 reports $1.0 \pm 0.4 \pm 0.3$ for $B(J/\psi(1S) \to e^+e^-) = 0.069 \pm 0.009$. We rescale to our best value $B(J/\psi(1S) \to e^+e^-) = (5.93 \pm 0.10) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

[228] ALBRECHT 87D assume $B^+B^-/B^0\overline{B}^0$ ratio is 55/45. $K\pi$ system is specifically selected as nonresonant.

$\Gamma(J/\psi(1S)K^*(892)^0)/\Gamma_{total}$ — Γ_{84}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
1.31±0.07 OUR AVERAGE					
1.29±0.05±0.13		[229] ABE	02N	BELL	$e^+e^- \to \Upsilon(4S)$
1.24±0.05±0.09		[229] AUBERT	02	BABR	$e^+e^- \to \Upsilon(4S)$
1.74±0.20±0.18		[230] ABE	98O	CDF	$p\overline{p}$ 1.8 TeV
1.32±0.17±0.17		[231] JESSOP	97	CLE2	$e^+e^- \to \Upsilon(4S)$
1.28±0.66±0.02		[232] BORTOLETTO	92	CLEO	$e^+e^- \to \Upsilon(4S)$
1.28±0.60±0.02	6	[233] ALBRECHT	90J	ARG	$e^+e^- \to \Upsilon(4S)$
4.1 ±1.8 ±0.1	5	[234] BEBEK	87	CLEO	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1.36±0.27±0.22		[235] ABE	96H	CDF	Sup. by ABE 98O
1.69±0.31±0.18	29	[236] ALAM	94	CLE2	Sup. by JESSOP 97
		[237] ALBRECHT	94G	ARG	$e^+e^- \to \Upsilon(4S)$
4.0 ±0.30		[238] ALBAJAR	91E	UA1	$E_{cm}^{p\overline{p}}$= 630 GeV
3.3 ±0.18	5	[239] ALBRECHT	87D	ARG	$e^+e^- \to \Upsilon(4S)$
4.1 ±0.18	5	[240] ALAM	86	CLEO	Repl. by BEBEK 87

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

[230] ABE 98O reports $[B(B^0 \to J/\psi(1S)K^*(892)^0)]/[B(B^+ \to J/\psi(1S)K^+)] = 1.76 \pm 0.14 \pm 0.15$. We multiply by our best value $B(B^+ \to J/\psi(1S)K^+) = (9.9 \pm 1.0) \times 10^{-4}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

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

[232] BORTOLETTO 92 reports $1.1 \pm 0.5 \pm 0.3$ for $B(J/\psi(1S) \to e^+e^-) = 0.069 \pm 0.009$. We rescale to our best value $B(J/\psi(1S) \to e^+e^-) = (5.93 \pm 0.10) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

[233] ALBRECHT 90J reports $1.1 \pm 0.5 \pm 0.2$ for $B(J/\psi(1S) \to e^+e^-) = 0.069 \pm 0.009$. We rescale to our best value $B(J/\psi(1S) \to e^+e^-) = (5.93 \pm 0.10) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

[234] BEBEK 87 reports $3.5 \pm 1.6 \pm 0.3$ for $B(J/\psi(1S) \to e^+e^-) = 0.069 \pm 0.009$. We rescale to our best value $B(J/\psi(1S) \to e^+e^-) = (5.93 \pm 0.10) \times 10^{-2}$. Our first

error is their experiment's error and our second error is the systematic error from using our best value. Updated in BORTOLETTO 92 to use the same assumptions.

[235] ABE 96H assumes that $B(B^+ \to J/\psi K^+) = (1.02 \pm 0.14) \times 10^{-3}$.

[236] The neutral and charged B events together are predominantly longitudinally polarized, $\Gamma_L/\Gamma = 0.080 \pm 0.08 \pm 0.05$. This can be compared with a prediction using HQET, 0.73 (KRAMER 92). This polarization indicates that the $B \to \psi K^*$ decay is dominated by the $CP = -1$ CP eigenstate. Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

[237] 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 $K^0_S \pi^0$.

[238] ALBAJAR 91E assumes B^0_d production fraction of 36%.

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

[240] ALAM 86 assumes $B^\pm / B^0$ ratio is 60/40. The observation of the decay $B^+ \to J/\psi K^*(892)^+$ (HAAS 85) has been retracted in this paper.

$\Gamma(J/\psi(1S) K^*(892)^0)/\Gamma(J/\psi(1S) K^0)$ — Γ_{84}/Γ_{82}

VALUE	DOCUMENT ID		TECN	COMMENT
1.48±0.12 OUR AVERAGE				
1.49±0.10±0.08	[241] AUBERT	02	BABR	$e^+e^- \to \Upsilon(4S)$
1.39±0.36±0.10	ABE	96Q	CDF	$p\overline{p}$

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

$\Gamma(J/\psi(1S)\phi K^0)/\Gamma_{total}$ — Γ_{85}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
$\mathbf{(8.8^{+3.5}_{-3.0} \pm 1.3) \times 10^{-5}}$	[242] ANASTASSOV	00	CLE2	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma(J/\psi(1S) K(1270)^0)/\Gamma_{total}$ — Γ_{86}/Γ

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
1.30±0.34±0.32	[243] ABE	01L	BELL	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma(J/\psi(1S)\pi^0)/\Gamma_{total}$ — Γ_{87}/Γ

VALUE (units 10^{-5})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
2.2±0.4 OUR AVERAGE						
2.3±0.5±0.2			[244] ABE	03B	BELL	$e^+e^- \to \Upsilon(4S)$
2.0±0.6±0.2			[244] AUBERT	02	BABR	$e^+e^- \to \Upsilon(4S)$
$2.5^{+1.1}_{-0.9}\pm0.2$			[244] AVERY	00	CLE2	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<32	90		[245] ACCIARRI	97C	L3	
<5.8	90		BISHAI	96	CLE2	$e^+e^- \to \Upsilon(4S)$
<690	90	1	[246] ALEXANDER	95	CLE2	Sup. by BISHAI 96

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

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

[246] Assumes equal production of $B^+ B^-$ and $B^0 \overline{B}^0$ on $\Upsilon(4S)$.

$\Gamma(J/\psi(1S)\eta)/\Gamma_{total}$ — Γ_{88}/Γ

VALUE	CL%	DOCUMENT ID		TECN
$<1.2 \times 10^{-3}$	90	[247] ACCIARRI	97C	L3

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

$\Gamma(J/\psi(1S)\pi^+\pi^-)/\Gamma_{total}$ — Γ_{89}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
$(4.6\pm0.7\pm0.6) \times 10^{-5}$	[248] AUBERT	03B	BABR	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma(J/\psi(1S)\rho^0)/\Gamma_{total}$ — Γ_{90}/Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID		TECN	COMMENT
1.6±0.6±0.4		[249] AUBERT	03B	BABR	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<25	90	BISHAI	96	CLE2	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma(J/\psi(1S)\omega)/\Gamma_{total}$ — Γ_{91}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<2.7 \times 10^{-4}$	90	BISHAI	96	CLE2	$e^+e^- \to \Upsilon(4S)$

$\Gamma(J/\psi(1S)K^0\pi^+\pi^-)/\Gamma_{total}$ — Γ_{92}/Γ

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
10.3±3.3±1.5	[250] AFFOLDER	02B	CDF	$p\overline{p}$ 1.8 TeV

[250] Uses $B^0 \to J/\psi(1S)K^0_S$ decay as a reference and B($B^0 \to J/\psi(1S)K^0$)= 8.3×10^{-4}.

$\Gamma(J/\psi(1S)K^0\rho^0)/\Gamma_{total}$ — Γ_{93}/Γ

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
5.4±2.9±0.9	[251] AFFOLDER	02B	CDF	$p\overline{p}$ 1.8 TeV

[251] Uses $B^0 \to J/\psi(1S)K^0_S$ decay as a reference and B($B^0 \to J/\psi(1S)K^0$)= 8.3×10^{-4}.

$\Gamma(J/\psi(1S)K^*(892)^+\pi^-)/\Gamma_{total}$ — Γ_{94}/Γ

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
7.7±4.1±1.3	[252] AFFOLDER	02B	CDF	$p\overline{p}$ 1.8 TeV

[252] Uses $B^0 \to J/\psi(1S)K^0_S$ decay as a reference and B($B^0 \to J/\psi(1S)K^0$)= 8.3×10^{-4}.

$\Gamma(J/\psi(1S)K^*(892)^0\pi^+\pi^-)/\Gamma_{total}$ — Γ_{95}/Γ

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
6.6±1.9±1.1	[253] AFFOLDER	02B	CDF	$p\overline{p}$ 1.8 TeV

[253] Uses $B^0 \to J/\psi(1S)K^*(892)^0$ decay as a reference and B($B^0 \to J/\psi(1S)K^0$)= 12.4×10^{-4}.

$\Gamma(\psi(2S)K^0)/\Gamma_{total}$ — Γ_{96}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
6.2±0.7 OUR AVERAGE					
6.7±1.1		[254] ABE	03B	BELL	$e^+e^- \to \Upsilon(4S)$
6.9±1.1±1.1		[254] AUBERT	02	BABR	$e^+e^- \to \Upsilon(4S)$
5.0±1.1±0.6		[254] RICHICHI	01	CLE2	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<8	90	[254] ALAM	94	CLE2	$e^+e^- \to \Upsilon(4S)$
<15	90	[254] BORTOLETTO	92	CLEO	$e^+e^- \to \Upsilon(4S)$
<28	90	[254] ALBRECHT	90J	ARG	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma(\psi(2S)K^0)/\Gamma(J/\psi(1S)K^0)$ — Γ_{96}/Γ_{82}

VALUE	DOCUMENT ID		TECN	COMMENT
0.82±0.13±0.12	[255] AUBERT	02	BABR	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma(\psi(2S)K^+\pi^-)/\Gamma_{total}$ — Γ_{97}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.001	90	[256] ALBRECHT	90J	ARG	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma(\psi(2S)K^*(892)^0)/\Gamma_{total}$ — Γ_{98}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
8.0±1.3 OUR AVERAGE					
7.6±1.1±1.0		[257] RICHICHI	01	CLE2	$e^+e^- \to \Upsilon(4S)$
9.0±2.2±0.9		[258] ABE	98O	CDF	$p\overline{p}$ 1.8 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<19	90	[259] ALAM	94	CLE2	Repl. by RICHICHI 01
14 ±8 ±4		[259] BORTOLETTO	92	CLEO	$e^+e^- \to \Upsilon(4S)$
<23	90	[259] ALBRECHT	90J	ARG	$e^+e^- \to \Upsilon(4S)$

[257] Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.
[258] ABE 98O reports $[B(B^0 \to \psi(2S)K^*(892)^0)]/[B(B^+ \to J/\psi(1S)K^+)] = 0.908 \pm 0.194 \pm 0.10$. We multiply by our best value $B(B^+ \to J/\psi(1S)K^+) = (9.9 \pm 1.0) \times 10^{-4}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.
[259] Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

$\Gamma(\chi_{c0}(1P)K^0)/\Gamma_{total}$ — Γ_{99}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<5.0 \times 10^{-4}$	90	[260] EDWARDS	01	CLE2	$e^+e^- \to \Upsilon(4S)$

[260] EDWARDS 01 assumes equal production of B^0 and B^+ at the $\Upsilon(4S)$. The correlated uncertainties (28.3)% from $B(J/\psi(1S) \to \gamma\eta_c)$ in those modes have been accounted for.

$\Gamma(\chi_{c1}(1P)K^0)/\Gamma_{total}$ — Γ_{100}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
$\mathbf{4.0^{+1.2}_{-1.0}}$ **OUR AVERAGE**					
$4.7\pm1.5\pm0.4$		[261] AUBERT	02	BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$3.4^{+1.7}_{-1.2}\pm0.3$		[262] AVERY	00	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<27	90	[263] ALAM	94	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

[261] AUBERT 02 reports $5.4 \pm 1.4 \pm 1.1$ for $B(\chi_{c1}(1P) \rightarrow \gamma J/\psi(1S)) = 0.273 \pm 0.016$. We rescale to our best value $B(\chi_{c1}(1P) \rightarrow \gamma J/\psi(1S)) = (31.6 \pm 2.7) \times 10^{-2}$. 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 $\Upsilon(4S)$.

[262] AVERY 00 reports $3.9^{+1.9}_{-1.3} \pm 0.4$ for $B(\chi_{c1}(1P) \rightarrow \gamma J/\psi(1S)) = 0.273 \pm 0.016$. We rescale to our best value $B(\chi_{c1}(1P) \rightarrow \gamma J/\psi(1S)) = (31.6 \pm 2.7) \times 10^{-2}$. 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 $\Upsilon(4S)$.

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

$\Gamma(\chi_{c1}(1P)K^*(892)^0)/\Gamma_{total}$ — Γ_{101}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
$\mathbf{4.1\pm1.4\pm0.4}$		[264] AUBERT	02	BABR	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<21	90	[265] ALAM	94	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

[264] AUBERT 02 reports $4.8 \pm 1.4 \pm 0.9$ for $B(\chi_{c1}(1P) \rightarrow \gamma J/\psi(1S)) = 0.273 \pm 0.016$. We rescale to our best value $B(\chi_{c1}(1P) \rightarrow \gamma J/\psi(1S)) = (31.6 \pm 2.7) \times 10^{-2}$. 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 $\Upsilon(4S)$.

[265] BORTOLETTO 92 assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

$\Gamma(\chi_{c1}(1P)K^0)/\Gamma(J/\psi(1S)K^0)$ — Γ_{100}/Γ_{82}

VALUE	DOCUMENT ID		TECN	COMMENT
$\mathbf{0.57\pm0.17\pm0.05}$	[266] AUBERT	02	BABR	$e^+e^- \rightarrow \Upsilon(4S)$

[266] AUBERT 02 reports $0.66 \pm 0.11 \pm 0.17$ for $B(\chi_{c1}(1P) \rightarrow \gamma J/\psi(1S)) = 0.273 \pm 0.016$. We rescale to our best value $B(\chi_{c1}(1P) \rightarrow \gamma J/\psi(1S)) = (31.6 \pm 2.7) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.

$\Gamma(\chi_{c1}(1P)K^*(892)^0)/\Gamma(\chi_{c1}(1P)K^0)$ — $\Gamma_{101}/\Gamma_{100}$

VALUE	DOCUMENT ID		TECN	COMMENT
$\mathbf{0.89\pm0.34\pm0.17}$	[267] AUBERT	02	BABR	$e^+e^- \rightarrow \Upsilon(4S)$

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

$\Gamma(K^+\pi^-)/\Gamma_{total}$ Γ_{102}/Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID	TECN	COMMENT
1.85±0.12 OUR AVERAGE		Error includes scale factor of 1.2.		
$1.79\pm0.09\pm0.07$		[268] AUBERT 02Q	BABR	$e^+e^- \to \Upsilon(4S)$
$2.25\pm0.19\pm0.18$		[268] CASEY 02	BELL	$e^+e^- \to \Upsilon(4S)$
$1.72^{+0.25}_{-0.24}\pm0.12$		[268] CRONIN-HEN...00	CLE2	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$1.93^{+0.34}_{-0.32}{}^{+0.15}_{-0.06}$		[268] ABE 01H	BELL	Repl. by CASEY 02
$1.67\pm0.16\pm0.13$		[268] AUBERT 01E	BABR	Repl. by AUBERT 02Q
$<\ 6.6$	90	[269] ABE 00C	SLD	$e^+e^- \to Z$
$1.5\ ^{+0.5}_{-0.4}\ \pm0.14$		GODANG 98	CLE2	Repl. by CRONIN-HENNESSY 00
$2.4\ ^{+1.7}_{-1.1}\ \pm0.2$		[270] ADAM 96D	DLPH	$e^+e^- \to Z$
$<\ 1.7$	90	ASNER 96	CLE2	Sup. by ADAM 96D
$<\ 3.0$	90	[271] BUSKULIC 96V	ALEP	$e^+e^- \to Z$
$<\ 9$	90	[272] ABREU 95N	DLPH	Sup. by ADAM 96D
$<\ 8.1$	90	[273] AKERS 94L	OPAL	$e^+e^- \to Z$
$<\ 2.6$	90	[274] BATTLE 93	CLE2	$e^+e^- \to \Upsilon(4S)$
<18	90	ALBRECHT 91B	ARG	$e^+e^- \to \Upsilon(4S)$
$<\ 9$	90	[275] AVERY 89B	CLEO	$e^+e^- \to \Upsilon(4S)$
<32	90	AVERY 87	CLEO	$e^+e^- \to \Upsilon(4S)$

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

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

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

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

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

[273] Assumes B($Z \to b\overline{b}$) = 0.217 and B^0_d (B^0_s) fraction 39.5% (12%).

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

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

$\Gamma(K^+\pi^-)/\Gamma(K^0\pi^0)$ $\Gamma_{102}/\Gamma_{103}$

VALUE	DOCUMENT ID	TECN	COMMENT
$\mathbf{1.20^{+0.50}_{-0.58}{}^{+0.22}_{-0.32}}$	[276] ABE 01H	BELL	$e^+e^- \to \Upsilon(4S)$

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

$\left[\Gamma(K^+\pi^-)+\Gamma(\pi^+\pi^-)\right]/\Gamma_{total}$ $(\Gamma_{102}+\Gamma_{153})/\Gamma$

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
1.9±0.6 OUR AVERAGE					
$2.8^{+1.5}_{-1.0}\pm2.0$		[277] ADAM	96D	DLPH	$e^+e^- \rightarrow Z$
$1.8^{+0.6}_{-0.5}{}^{+0.3}_{-0.4}$	17.2	ASNER	96	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$2.4^{+0.8}_{-0.7}\pm0.2$		[278] BATTLE	93	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

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

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

$\Gamma(K^0\pi^0)/\Gamma_{total}$ Γ_{103}/Γ

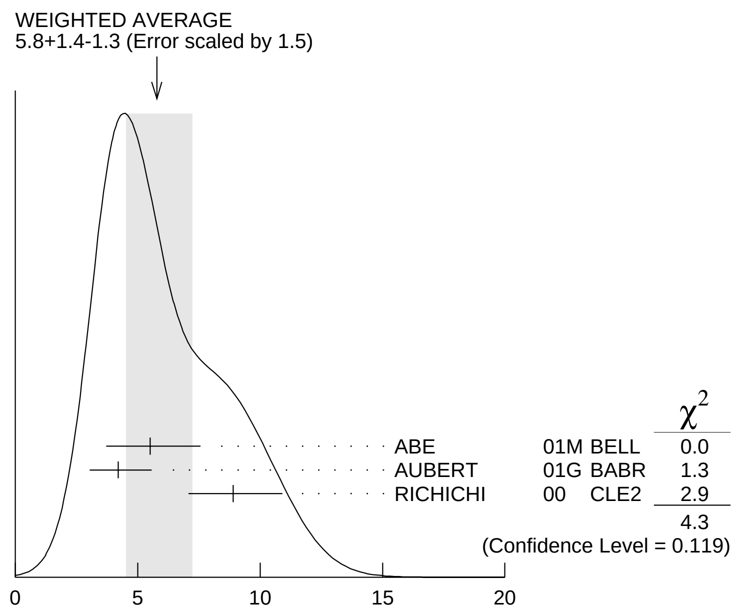
VALUE (units 10^{-5})	CL%	DOCUMENT ID		TECN	COMMENT
0.90±0.22 OUR AVERAGE					
$0.80^{+0.33}_{-0.31}\pm0.16$		[279] CASEY	02	BELL	$e^+e^- \rightarrow \Upsilon(4S)$
$0.82^{+0.31}_{-0.27}\pm0.12$		[279] AUBERT	01E	BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$1.46^{+0.59}_{-0.51}{}^{+0.24}_{-0.33}$		[279] CRONIN-HEN...	00	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$1.60^{+0.72}_{-0.59}{}^{+0.25}_{-0.27}$		[279] ABE	01H	BELL	Repl. by CASEY 02
<4.1	90	GODANG	98	CLE2	Repl. by CRONIN-HENNESSY 00
<4.0	90	ASNER	96	CLE2	Rep. by GODANG 98

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

$\Gamma(\eta' K^0)/\Gamma_{total}$ Γ_{104}/Γ

VALUE (units 10^{-5})	DOCUMENT ID		TECN	COMMENT
$5.8^{+1.4}_{-1.3}$ OUR AVERAGE Error includes scale factor of 1.5. See the ideogram below.				
$5.5^{+1.9}_{-1.6}\pm0.8$	[280] ABE	01M	BELL	$e^+e^- \rightarrow \Upsilon(4S)$
$4.2^{+1.3}_{-1.1}\pm0.4$	[280] AUBERT	01G	BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$8.9^{+1.8}_{-1.6}\pm0.9$	[280] RICHICHI	00	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$4.7^{+2.7}_{-2.0}\pm0.9$	BEHRENS	98	CLE2	Repl. by RICHICHI 00

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



$\Gamma\left(\eta' K^0\right)/\Gamma_{total}$ (units 10^{-5})

$\Gamma\left(\eta' K^*(892)^0\right)/\Gamma_{total}$ Γ_{105}/Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID		TECN	COMMENT
<2.4	90	[281] RICHICHI	00	CLE2	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<3.9	90	BEHRENS	98	CLE2	Repl. by RICHICHI 00

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

$\Gamma\left(\eta K^*(892)^0\right)/\Gamma_{total}$ Γ_{106}/Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID		TECN	COMMENT
$\mathbf{1.38^{+0.55}_{-0.46}\pm0.16}$		[282] RICHICHI	00	CLE2	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<3.0	90	BEHRENS	98	CLE2	Repl. by RICHICHI 00

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

$\Gamma\left(\eta K^0\right)/\Gamma_{total}$ Γ_{107}/Γ

VALUE (units 10^{-6})	CL%	DOCUMENT ID		TECN	COMMENT
< 9.3	90	[283] RICHICHI	00	CLE2	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<33	90	BEHRENS	98	CLE2	Repl. by RICHICHI 00

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

$\Gamma(\omega K^0)/\Gamma_{total}$ Γ_{108}/Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID		TECN	COMMENT
<1.3	90	[284] AUBERT	01G	BABR	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<2.1	90	[284] JESSOP	00	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
<5.7	90	[284] BERGFELD	98	CLE2	Repl. by JESSOP 00

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

$\Gamma(K^0_S X^0\,(\text{Familon}))/\Gamma_{total}$ Γ_{109}/Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID		TECN	COMMENT
<5.3	90	[285] AMMAR	01B	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

[285] AMMAR 01B searched for the two-body decay of the B meson to a massless neutral feebly-interacting particle X^0 such as the familon, the Nambu-Goldstone boson associated with a sponateously broken global family symmetry.

$\Gamma(\omega K^*(892)^0)/\Gamma_{total}$ Γ_{110}/Γ

VALUE	CL%	DOCUMENT ID		TECN
$<2.3 \times 10^{-5}$	90	[286] BERGFELD	98	CLE2

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

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

VALUE (units 10^{-6})	CL%	DOCUMENT ID		TECN	COMMENT
< 0.6	90	[287] AUBERT	02Q	BABR	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
< 0.9	90	[287] CASEY	02	BELL	$e^+e^- \rightarrow \Upsilon(4S)$
< 2.7	90	[287] ABE	01H	BELL	$e^+e^- \rightarrow \Upsilon(4S)$
< 2.5	90	[287] AUBERT	01E	BABR	$e^+e^- \rightarrow \Upsilon(4S)$
< 66	90	[288] ABE	00C	SLD	$e^+e^- \rightarrow Z$
< 1.9	90	[287] CRONIN-HEN...	00	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
< 4.3	90	GODANG	98	CLE2	Repl. by CRONIN-HENNESSY 00
< 46		[289] ADAM	96D	DLPH	$e^+e^- \rightarrow Z$
< 4	90	ASNER	96	CLE2	Repl. by GODANG 98
< 18	90	[290] BUSKULIC	96V	ALEP	$e^+e^- \rightarrow Z$
<120	90	[291] ABREU	95N	DLPH	Sup. by ADAM 96D
< 7	90	[292] BATTLE	93	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

[287] Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.
[288] ABE 00C assumes B($Z \rightarrow b\overline{b}$)=(21.7 ± 0.1)% and the B fractions $f_{B^0}=f_{B^+}=(39.7^{+1.8}_{-2.2})$% and $f_{B_s}=(10.5^{+1.8}_{-2.2})$%.
[289] ADAM 96D assumes $f_{B^0} = f_{B^-} = 0.39$ and $f_{B_s} = 0.12$. Contributions from B^0 and B_s decays cannot be separated. Limits are given for the weighted average of the decay rates for the two neutral B mesons.
[290] BUSKULIC 96V assumes PDG 96 production fractions for B^0, B^+, B_s, b baryons.
[291] Assumes a B^0, B^- production fraction of 0.39 and a B_s production fraction of 0.12. Contributions from B^0 and B^0_s decays cannot be separated. Limits are given for the weighted average of the decay rates for the two neutral B mesons.
[292] BATTLE 93 assumes equal production of $B^0\overline{B}^0$ and B^+B^- at $\Upsilon(4S)$.

$\Gamma(K^0\overline{K}^0)/\Gamma_{total}$ — Γ_{112}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<4.1\times10^{-6}$	90	[293] CASEY	02	BELL	$e^+e^-\to\Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<1.7\times10^{-5}$	90	GODANG	98	CLE2	$e^+e^-\to\Upsilon(4S)$

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

$\Gamma(K^+\pi^-\pi^0)/\Gamma_{total}$ — Γ_{113}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<40\times10^{-6}$	90	[294] ECKHART	02	CLE2	$e^+e^-\to\Upsilon(4S)$

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

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<3.2\times10^{-5}$	90	[295] JESSOP	00	CLE2	$e^+e^-\to\Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<3.5\times10^{-5}$	90	ASNER	96	CLE2	Repl. by JESSOP 00

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

$\Gamma(K^0\pi^+\pi^-)/\Gamma_{total}$ — Γ_{115}/Γ

VALUE (units 10^{-6})	CL%	DOCUMENT ID		TECN	COMMENT
$50^{+10}_{-9}\pm7$		[296] ECKHART	02	CLE2	$e^+e^-\to\Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<440	90	ALBRECHT	91E	ARG	$e^+e^-\to\Upsilon(4S)$

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

$\Gamma(K^0\rho^0)/\Gamma_{total}$ — Γ_{116}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<3.9\times10^{-5}$	90	ASNER	96	CLE2	$e^+e^-\to\Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<3.2\times10^{-4}$	90	ALBRECHT	91B	ARG	$e^+e^-\to\Upsilon(4S)$
$<5.0\times10^{-4}$	90	[297] AVERY	89B	CLEO	$e^+e^-\to\Upsilon(4S)$
<0.064	90	[298] AVERY	87	CLEO	$e^+e^-\to\Upsilon(4S)$

[297] AVERY 89B reports $< 5.8\times10^{-4}$ assuming the $\Upsilon(4S)$ decays 43% to $B^0\overline{B}^0$. We rescale to 50%.

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

$\Gamma(K^0 f_0(980))/\Gamma_{total}$ — Γ_{117}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<3.6\times10^{-4}$	90	[299] AVERY	89B	CLEO	$e^+e^-\to\Upsilon(4S)$

[299] AVERY 89B reports $< 4.2\times10^{-4}$ assuming the $\Upsilon(4S)$ decays 43% to $B^0\overline{B}^0$. We rescale to 50%.

$\Gamma(K^*(892)^+\pi^-)/\Gamma_{total}$ — Γ_{118}/Γ

VALUE (units 10^{-6})	CL%	DOCUMENT ID		TECN	COMMENT
$\mathbf{16^{+6}_{-5}\pm 2}$		[300] ECKHART	02	CLE2	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<$ 72	90	ASNER	96	CLE2	$e^+e^- \to \Upsilon(4S)$
$<$620	90	ALBRECHT	91B	ARG	$e^+e^- \to \Upsilon(4S)$
$<$380	90	[301] AVERY	89B	CLEO	$e^+e^- \to \Upsilon(4S)$
$<$560	90	[302] AVERY	87	CLEO	$e^+e^- \to \Upsilon(4S)$

[300] Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.
[301] AVERY 89B reports $< 4.4 \times 10^{-4}$ assuming the $\Upsilon(4S)$ decays 43% to $B^0\overline{B}^0$. We rescale to 50%.
[302] AVERY 87 reports $< 7 \times 10^{-4}$ assuming the $\Upsilon(4S)$ decays 40% to $B^0\overline{B}^0$. We rescale to 50%.

$\Gamma(K^*(892)^0\pi^0)/\Gamma_{total}$ — Γ_{119}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$\mathbf{<3.6\times 10^{-6}}$	90	[216] JESSOP	00	CLE2	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<2.8\times 10^{-5}$	90	ASNER	96	CLE2	Repl. by JESSOP 00

$\Gamma(K_2^*(1430)^+\pi^-)/\Gamma_{total}$ — Γ_{120}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$\mathbf{<2.6\times 10^{-3}}$	90	ALBRECHT	91B	ARG	$e^+e^- \to \Upsilon(4S)$

$\Gamma(K^0K^-\pi^+)/\Gamma_{total}$ — Γ_{121}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$\mathbf{<21\times 10^{-6}}$	90	[303] ECKHART	02	CLE2	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma(K^+K^-\pi^0)/\Gamma_{total}$ — Γ_{122}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$\mathbf{<19\times 10^{-6}}$	90	[304] ECKHART	02	CLE2	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma(K^0K^+K^-)/\Gamma_{total}$ — Γ_{123}/Γ

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

$\Gamma(K^0\phi)/\Gamma_{total}$ — Γ_{124}/Γ

VALUE (units 10^{-6})	CL%	DOCUMENT ID		TECN	COMMENT
$\mathbf{8.1^{+3.1}_{-2.5}\pm 0.8}$		[305] AUBERT	01D	BABR	$e^+e^- \to \Upsilon(4S)$

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

< 12.3	90	[305] BRIERE	01	CLE2	$e^+ e^- \to \Upsilon(4S)$
< 31	90	[305] BERGFELD	98	CLE2	
< 88	90	ASNER	96	CLE2	$e^+ e^- \to \Upsilon(4S)$
< 720	90	ALBRECHT	91B	ARG	$e^+ e^- \to \Upsilon(4S)$
< 420	90	[306] AVERY	89B	CLEO	$e^+ e^- \to \Upsilon(4S)$
<1000	90	[307] AVERY	87	CLEO	$e^+ e^- \to \Upsilon(4S)$

[305] Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.
[306] AVERY 89B reports $< 4.9 \times 10^{-4}$ assuming the $\Upsilon(4S)$ decays 43% to $B^0 \overline{B}^0$. We rescale to 50%.
[307] AVERY 87 reports $< 1.3 \times 10^{-3}$ assuming the $\Upsilon(4S)$ decays 40% to $B^0 \overline{B}^0$. We rescale to 50%.

$\Gamma(K^- \pi^+ \pi^+ \pi^-)/\Gamma_{\text{total}}$ Γ_{125}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<2.3 × 10⁻⁴	90	[308] ADAM	96D	DLPH	$e^+ e^- \to Z$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<2.1 \times 10^{-4}$	90	[309] ABREU	95N	DLPH	Sup. by ADAM 96D

[308] ADAM 96D assumes $f_{B^0} = f_{B^-} = 0.39$ and $f_{B_s} = 0.12$. Contributions from B^0 and B_s decays cannot be separated. Limits are given for the weighted average of the decay rates for the two neutral B mesons.
[309] Assumes a B^0, B^- production fraction of 0.39 and a B_s production fraction of 0.12. Contributions from B^0 and B_s^0 decays cannot be separated. Limits are given for the weighted average of the decay rates for the two neutral B mesons.

$\Gamma(K^*(892)^0 \pi^+ \pi^-)/\Gamma_{\text{total}}$ Γ_{126}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<1.4 \times 10^{-3}$	90	ALBRECHT	91E	ARG	$e^+ e^- \to \Upsilon(4S)$

$\Gamma(K^*(892)^0 \rho^0)/\Gamma_{\text{total}}$ Γ_{127}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<3.4 \times 10^{-5}$	90	[310] GODANG	02	CLE2	$e^+ e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<2.86 \times 10^{-4}$	90	[311] ABE	00C	SLD	$e^+ e^- \to Z$
$<4.6 \times 10^{-4}$	90	ALBRECHT	91B	ARG	$e^+ e^- \to \Upsilon(4S)$
$<5.8 \times 10^{-4}$	90	[312] AVERY	89B	CLEO	$e^+ e^- \to \Upsilon(4S)$
$<9.6 \times 10^{-4}$	90	[313] AVERY	87	CLEO	$e^+ e^- \to \Upsilon(4S)$

[310] Assumes a helicity 00 configuration. For a helicity 11 configuration, the limit decreases to 2.4×10^{-5}.
[311] ABE 00C assumes B($Z \to b\overline{b}$)=(21.7 ± 0.1)% and the B fractions $f_{B^0}=f_{B^+}=(39.7^{+1.8}_{-2.2})$% and $f_{B_s}=(10.5^{+1.8}_{-2.2})$%.
[312] AVERY 89B reports $< 6.7 \times 10^{-4}$ assuming the $\Upsilon(4S)$ decays 43% to $B^0 \overline{B}^0$. We rescale to 50%.
[313] AVERY 87 reports $< 1.2 \times 10^{-3}$ assuming the $\Upsilon(4S)$ decays 40% to $B^0 \overline{B}^0$. We rescale to 50%.

$\Gamma(K^*(892)^0 f_0(980))/\Gamma_{total}$ — Γ_{128}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<1.7 × 10^{-4}	90	[314] AVERY	89B	CLEO	$e^+e^- \to \Upsilon(4S)$

[314] AVERY 89B reports $< 2.0 \times 10^{-4}$ assuming the $\Upsilon(4S)$ decays 43% to $B^0\overline{B}^0$. We rescale to 50%.

$\Gamma(K_1(1400)^+\pi^-)/\Gamma_{total}$ — Γ_{129}/Γ

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

$\Gamma(K^- a_1(1260)^+)/\Gamma_{total}$ — Γ_{130}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<2.3 × 10^{-4}	90	[315] ADAM	96D	DLPH	$e^+e^- \to Z$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<3.9 × 10^{-4}	90	[316] ABREU	95N	DLPH	Sup. by ADAM 96D

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

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

$\Gamma(K^*(892)^0 K^+ K^-)/\Gamma_{total}$ — Γ_{131}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<6.1 × 10^{-4}	90	ALBRECHT	91E	ARG	$e^+e^- \to \Upsilon(4S)$

$\Gamma(K^*(892)^0 \phi)/\Gamma_{total}$ — Γ_{132}/Γ

VALUE (units 10^{-6})	CL%	DOCUMENT ID		TECN	COMMENT
$9.5^{+2.4}_{-2.0}$ OUR AVERAGE					
$8.7^{+2.5}_{-2.1}\pm1.1$		[317] AUBERT	01D	BABR	$e^+e^- \to \Upsilon(4S)$
$11.5^{+4.5}_{-3.7}{}^{+1.8}_{-1.7}$		[317] BRIERE	01	CLE2	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<384	90	[318] ABE	00C	SLD	$e^+e^- \to Z$
< 21	90	[317] BERGFELD	98	CLE2	
< 43	90	ASNER	96	CLE2	$e^+e^- \to \Upsilon(4S)$
<320	90	ALBRECHT	91B	ARG	$e^+e^- \to \Upsilon(4S)$
<380	90	[319] AVERY	89B	CLEO	$e^+e^- \to \Upsilon(4S)$
<380	90	[320] AVERY	87	CLEO	$e^+e^- \to \Upsilon(4S)$

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

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

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

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

$\Gamma(\overline{K}^*(892)^0 K^*(892)^0)/\Gamma_{total}$ — Γ_{133}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<2.2 × 10⁻⁵	90	[321] GODANG 02	CLE2	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$<4.69 \times 10^{-4}$	90	[322] ABE 00C	SLD	$e^+e^- \to Z$

[321] Assumes a helicity 00 configuration. For a helicity 11 configuration, the limit decreases to 1.9×10^{-5}.

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

$\Gamma(K^*(892)^0 K^*(892)^0)/\Gamma_{total}$ — Γ_{134}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<3.7 \times 10^{-5}$	90	[323] GODANG 02	CLE2	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma(K^*(892)^+ K^*(892)^-)/\Gamma_{total}$ — Γ_{135}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<1.41 \times 10^{-4}$	90	[324] GODANG 02	CLE2	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma(K_1(1400)^0 \rho^0)/\Gamma_{total}$ — Γ_{136}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<3.0 \times 10^{-3}$	90	ALBRECHT 91B	ARG	$e^+e^- \to \Upsilon(4S)$

$\Gamma(K_1(1400)^0 \phi)/\Gamma_{total}$ — Γ_{137}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<5.0 \times 10^{-3}$	90	ALBRECHT 91B	ARG	$e^+e^- \to \Upsilon(4S)$

$\Gamma(K_2^*(1430)^0 \rho^0)/\Gamma_{total}$ — Γ_{138}/Γ

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

$\Gamma(K_2^*(1430)^0 \phi)/\Gamma_{total}$ — Γ_{139}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<1.4 \times 10^{-3}$	90	ALBRECHT 91B	ARG	$e^+e^- \to \Upsilon(4S)$

$\Gamma(K^*(892)^0 \gamma)/\Gamma_{total}$ — Γ_{140}/Γ

VALUE (units 10^{-5})	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
4.3 ±0.4 OUR AVERAGE					
4.23±0.40±0.22			[325] AUBERT 02C	BABR	$e^+e^- \to \Upsilon(4S)$
$4.55^{+0.72}_{-0.68}\pm0.34$			[326] COAN 00	CLE2	$e^+e^- \to \Upsilon(4S)$

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

<11	90		ACOSTA	02G	CDF	$p\overline{p}$ at 1.8 TeV
<21	90		[327] ADAM	96D	DLPH	$e^+e^- \rightarrow Z$
$4.0 \pm 1.7 \pm 0.8$		8	[328] AMMAR	93	CLE2	Repl. by COAN 00
<42	90		ALBRECHT	89G	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
<24	90		[329] AVERY	89B	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
<210	90		AVERY	87	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

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

[326] Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$. No evidence for a nonresonant $K\pi\gamma$ contamination was seen; the central value assumes no contamination.

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

[328] AMMAR 93 observed 6.6 ± 2.8 events above background.

[329] AVERY 89B reports $< 2.8 \times 10^{-4}$ assuming the $\Upsilon(4S)$ decays 43% to $B^0\overline{B}^0$. We rescale to 50%.

$\Gamma(K^+\pi^-\gamma)/\Gamma_{total}$ — Γ_{141}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
$\mathbf{(4.6^{+1.3+0.5}_{-1.2-0.7}) \times 10^{-6}}$	[330,331] NISHIDA	02	BELL	$e^+e^- \rightarrow \Upsilon(4S)$

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

[331] 1.25 GeV/c^2 $< M_{K\pi} <$ 1.6 GeV/c^2

$\Gamma(K^*(1410)\gamma)/\Gamma_{total}$ — Γ_{142}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$\mathbf{<1.3 \times 10^{-4}}$	90	[332] NISHIDA	02	BELL	$e^+e^- \rightarrow \Upsilon(4S)$

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

$\Gamma(K^+\pi^-\gamma\ (\mathrm{NR}))/\Gamma_{total}$ — Γ_{143}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$\mathbf{<2.6 \times 10^{-6}}$	90	[333,334] NISHIDA	02	BELL	$e^+e^- \rightarrow \Upsilon(4S)$

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

[334] 1.25 GeV/c^2 $< M_{K\pi} <$ 1.6 GeV/c^2

$\Gamma(K_1(1270)^0\gamma)/\Gamma_{total}$ — Γ_{144}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0070	90	[335] ALBRECHT	89G	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

[335] ALBRECHT 89G reports < 0.0078 assuming the $\Upsilon(4S)$ decays 45% to $B^0\overline{B}^0$. We rescale to 50%.

$\Gamma(K_1(1400)^0\gamma)/\Gamma_{total}$ — Γ_{145}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0043	90	[336] ALBRECHT	89G	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

[336] ALBRECHT 89G reports < 0.0048 assuming the $\Upsilon(4S)$ decays 45% to $B^0\overline{B}^0$. We rescale to 50%.

$\Gamma(K_2^*(1430)^0\gamma)/\Gamma_{total}$ — Γ_{146}/Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID		TECN	COMMENT
1.3±0.5±0.1		[337] NISHIDA	02	BELL	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<40	90	[338] ALBRECHT	89G	ARG	$e^+e^- \to \Upsilon(4S)$

[337] Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.
[338] ALBRECHT 89G reports $< 4.4 \times 10^{-4}$ assuming the $\Upsilon(4S)$ decays 45% to $B^0\overline{B}^0$. We rescale to 50%.

$\Gamma(K^*(1680)^0\gamma)/\Gamma_{total}$ — Γ_{147}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0020	90	[339] ALBRECHT	89G	ARG	$e^+e^- \to \Upsilon(4S)$

[339] ALBRECHT 89G reports < 0.0022 assuming the $\Upsilon(4S)$ decays 45% to $B^0\overline{B}^0$. We rescale to 50%.

$\Gamma(K_3^*(1780)^0\gamma)/\Gamma_{total}$ — Γ_{148}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.010	90	[340] ALBRECHT	89G	ARG	$e^+e^- \to \Upsilon(4S)$

[340] ALBRECHT 89G reports < 0.011 assuming the $\Upsilon(4S)$ decays 45% to $B^0\overline{B}^0$. We rescale to 50%.

$\Gamma(K_4^*(2045)^0\gamma)/\Gamma_{total}$ — Γ_{149}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0043	90	[341] ALBRECHT	89G	ARG	$e^+e^- \to \Upsilon(4S)$

[341] ALBRECHT 89G reports < 0.0048 assuming the $\Upsilon(4S)$ decays 45% to $B^0\overline{B}^0$. We rescale to 50%.

$\Gamma(\rho^0\gamma)/\Gamma_{total}$ — Γ_{150}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<1.7 \times 10^{-5}$	90	[342] COAN	00	CLE2	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma(\omega\gamma)/\Gamma_{total}$ — Γ_{151}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<0.92 \times 10^{-5}$	90	[343] COAN	00	CLE2	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma(\phi\gamma)/\Gamma_{total}$ — Γ_{152}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<0.33 \times 10^{-5}$	90	[344] COAN	00	CLE2	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma(\pi^+\pi^-)/\Gamma_{total}$ — Γ_{153}/Γ

VALUE (units 10^{-6})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
4.8±0.5 OUR AVERAGE						
4.7±0.6±0.2			[345] AUBERT	02Q	BABR	$e^+e^- \to \Upsilon(4S)$
5.4±1.2±0.5			[345] CASEY	02	BELL	$e^+e^- \to \Upsilon(4S)$
$4.3^{+1.6}_{-1.4}\pm0.5$			[345] CRONIN-HEN...	00	CLE2	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
$5.6^{+2.3}_{-2.0}{}^{+0.4}_{-0.5}$			[345] ABE	01H	BELL	Repl. by CASEY 02
4.1±1.0±0.7			[345] AUBERT	01E	BABR	Repl. by AUBERT 02Q
< 67	90		[346] ABE	00C	SLD	$e^+e^- \to Z$
< 15	90		GODANG	98	CLE2	Repl. by CRONIN-HENNESSY 00
< 45	90		[347] ADAM	96D	DLPH	$e^+e^- \to Z$
< 20	90		ASNER	96	CLE2	Repl. by GODANG 98
< 41	90		[348] BUSKULIC	96V	ALEP	$e^+e^- \to Z$
< 55	90		[349] ABREU	95N	DLPH	Sup. by ADAM 96D
< 47	90		[350] AKERS	94L	OPAL	$e^+e^- \to Z$
< 29	90		[351] BATTLE	93	CLE2	$e^+e^- \to \Upsilon(4S)$
<130	90		[351] ALBRECHT	90B	ARG	$e^+e^- \to \Upsilon(4S)$
< 77	90		[352] BORTOLETTO	89	CLEO	$e^+e^- \to \Upsilon(4S)$
<260	90		[352] BEBEK	87	CLEO	$e^+e^- \to \Upsilon(4S)$
<500	90	4	GILES	84	CLEO	$e^+e^- \to \Upsilon(4S)$

[345] Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.
[346] ABE 00C assumes B($Z \to b\overline{b}$)=(21.7 ± 0.1)% and the B fractions f_{B^0}=f_{B^+}=$(39.7^{+1.8}_{-2.2})$% and f_{B_s}=$(10.5^{+1.8}_{-2.2})$%.
[347] ADAM 96D assumes $f_{B^0} = f_{B^-} = 0.39$ and $f_{B_s} = 0.12$.
[348] BUSKULIC 96V assumes PDG 96 production fractions for B^0, B^+, B_s, b baryons.
[349] Assumes a B^0, B^- production fraction of 0.39 and a B_s production fraction of 0.12.
[350] Assumes B($Z \to b\overline{b}$) = 0.217 and B^0_d (B^0_s) fraction 39.5% (12%).
[351] Assumes equal production of $B^0\overline{B}^0$ and B^+B^- at $\Upsilon(4S)$.
[352] Paper assumes the $\Upsilon(4S)$ decays 43% to $B^0\overline{B}^0$. We rescale to 50%.

$\Gamma(\pi^+\pi^-)/\Gamma(K^+\pi^-)$ — $\Gamma_{153}/\Gamma_{102}$

VALUE	DOCUMENT ID		TECN	COMMENT
$\mathbf{0.29^{+0.13}_{-0.12}{}^{+0.01}_{-0.02}}$	[353] ABE	01H	BELL	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma(\pi^0\pi^0)/\Gamma_{total}$ — Γ_{154}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<5.7 × 10^{-6}	90	[354] ASNER	02	CLE2	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<6.4 × 10^{-6}	90	[354] CASEY	02	BELL	$e^+e^- \to \Upsilon(4S)$
<9.3 × 10^{-6}	90	GODANG	98	CLE2	Repl. by ASNER 02
<0.91 × 10^{-5}	90	ASNER	96	CLE2	Repl. by GODANG 98
<6.0 × 10^{-5}	90	[355] ACCIARRI	95H	L3	$e^+e^- \to Z$

[354] Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.
[355] ACCIARRI 95H assumes f_{B^0} = 39.5 ± 4.0 and f_{B_s} = 12.0 ± 3.0%.

$\Gamma(\eta\pi^0)/\Gamma_{total}$ Γ_{155}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<2.9 × 10⁻⁶	90	[356] RICHICHI	00	CLE2	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<8 × 10^{-6}	90	BEHRENS	98	CLE2	Repl. by RICHICHI 00
<2.5 × 10^{-4}	90	[357] ACCIARRI	95H	L3	$e^+e^- \to Z$
<1.8 × 10^{-3}	90	[358] ALBRECHT	90B	ARG	$e^+e^- \to \Upsilon(4S)$

[356] Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.
[357] ACCIARRI 95H assumes f_{B^0} = 39.5 ± 4.0 and f_{B_s} = 12.0 ± 3.0%.
[358] ALBRECHT 90B limit assumes equal production of $B^0\overline{B}^0$ and B^+B^- at $\Upsilon(4S)$.

$\Gamma(\eta\eta)/\Gamma_{total}$ Γ_{156}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<1.8 × 10⁻⁵	90	BEHRENS	98	CLE2	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<4.1 × 10^{-4}	90	[359] ACCIARRI	95H	L3	$e^+e^- \to Z$

[359] ACCIARRI 95H assumes f_{B^0} = 39.5 ± 4.0 and f_{B_s} = 12.0 ± 3.0%.

$\Gamma(\eta'\pi^0)/\Gamma_{total}$ Γ_{157}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<5.7 × 10⁻⁶	90	[360] RICHICHI	00	CLE2	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<1.1 × 10^{-5}	90	BEHRENS	98	CLE2	Repl. by RICHICHI 00

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

$\Gamma(\eta'\eta')/\Gamma_{total}$ Γ_{158}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<4.7 × 10⁻⁵	90	BEHRENS	98	CLE2	$e^+e^- \to \Upsilon(4S)$

$\Gamma(\eta'\eta)/\Gamma_{total}$ Γ_{159}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<2.7 × 10⁻⁵	90	BEHRENS	98	CLE2	$e^+e^- \to \Upsilon(4S)$

$\Gamma(\eta'\rho^0)/\Gamma_{total}$ Γ_{160}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<1.2 × 10⁻⁵	90	[361] RICHICHI	00	CLE2	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<2.3 × 10^{-5}	90	BEHRENS	98	CLE2	Repl. by RICHICHI 00

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

$\Gamma(\eta\rho^0)/\Gamma_{total}$ — Γ_{161}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<1.0 \times 10^{-5}$	90	[362] RICHICHI	00	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<1.3 \times 10^{-5}$	90	BEHRENS	98	CLE2	Repl. by RICHICHI 00

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

$\Gamma(\omega\eta)/\Gamma_{total}$ — Γ_{162}/Γ

VALUE	CL%	DOCUMENT ID		TECN
$<1.2 \times 10^{-5}$	90	[363] BERGFELD	98	CLE2

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

$\Gamma(\omega\eta')/\Gamma_{total}$ — Γ_{163}/Γ

VALUE	CL%	DOCUMENT ID		TECN
$<6.0 \times 10^{-5}$	90	[364] BERGFELD	98	CLE2

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

$\Gamma(\omega\rho^0)/\Gamma_{total}$ — Γ_{164}/Γ

VALUE	CL%	DOCUMENT ID		TECN
$<1.1 \times 10^{-5}$	90	[365] BERGFELD	98	CLE2

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

$\Gamma(\omega\omega)/\Gamma_{total}$ — Γ_{165}/Γ

VALUE	CL%	DOCUMENT ID		TECN
$<1.9 \times 10^{-5}$	90	[366] BERGFELD	98	CLE2

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

$\Gamma(\phi\pi^0)/\Gamma_{total}$ — Γ_{166}/Γ

VALUE	CL%	DOCUMENT ID		TECN
$<0.5 \times 10^{-5}$	90	[367] BERGFELD	98	CLE2

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

$\Gamma(\phi\eta)/\Gamma_{total}$ — Γ_{167}/Γ

VALUE	CL%	DOCUMENT ID		TECN
$<0.9 \times 10^{-5}$	90	[368] BERGFELD	98	CLE2

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

$\Gamma(\phi\eta')/\Gamma_{total}$ — Γ_{168}/Γ

VALUE	CL%	DOCUMENT ID		TECN
$<3.1 \times 10^{-5}$	90	[369] BERGFELD	98	CLE2

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

$\Gamma(\phi\rho^0)/\Gamma_{total}$ — Γ_{169}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<1.3 × 10⁻⁵	90	[370] BERGFELD	98	CLE2	
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<1.56 \times 10^{-4}$	90	[371] ABE	00C	SLD	$e^+e^- \to Z$

[370] Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.
[371] ABE 00C assumes B($Z \to b\overline{b}$)=(21.7 ± 0.1)% and the B fractions $f_{B^0}=f_{B^+}=(39.7^{+1.8}_{-2.2})$% and $f_{B_s}=(10.5^{+1.8}_{-2.2})$%.

$\Gamma(\phi\omega)/\Gamma_{total}$ — Γ_{170}/Γ

VALUE	CL%	DOCUMENT ID		TECN
<2.1 × 10⁻⁵	90	[372] BERGFELD	98	CLE2

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

$\Gamma(\phi\phi)/\Gamma_{total}$ — Γ_{171}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<1.2 × 10⁻⁵	90	[373] BERGFELD	98	CLE2	
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<3.21 \times 10^{-4}$	90	[374] ABE	00C	SLD	$e^+e^- \to Z$
$<3.9 \times 10^{-5}$	90	ASNER	96	CLE2	$e^+e^- \to \Upsilon(4S)$

[373] Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.
[374] ABE 00C assumes B($Z \to b\overline{b}$)=(21.7 ± 0.1)% and the B fractions $f_{B^0}=f_{B^+}=(39.7^{+1.8}_{-2.2})$% and $f_{B_s}=(10.5^{+1.8}_{-2.2})$%.

$\Gamma(\pi^+\pi^-\pi^0)/\Gamma_{total}$ — Γ_{172}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<7.2 × 10⁻⁴	90	[375] ALBRECHT	90B	ARG	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma(\rho^0\pi^0)/\Gamma_{total}$ — Γ_{173}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<5.3 × 10⁻⁶	90	[376] GORDON	02	BELL	$e^+e^- \to \Upsilon(\mathrm{rS})$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<5.5 \times 10^{-6}$	90	[211] JESSOP	00	CLE2	$e^+e^- \to \Upsilon(4S)$
$<2.4 \times 10^{-5}$	90	ASNER	96	CLE2	Repl. by JESSOP 00
$<4.0 \times 10^{-4}$	90	[377] ALBRECHT	90B	ARG	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma(\rho^\mp\pi^\pm)/\Gamma_{total}$ — Γ_{174}/Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID		TECN	COMMENT
2.3 ±0.5 OUR AVERAGE					
$2.08^{+0.60}_{-0.63}{}^{+0.28}_{-0.31}$		[378] GORDON	02	BELL	$e^+e^- \to \Upsilon(\mathrm{rS})$
$2.76^{+0.84}_{-0.74} \pm 0.42$		[378] JESSOP	00	CLE2	$e^+e^- \to \Upsilon(4S)$

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

$<$ 8.8	90	ASNER	96	CLE2	Repl. by JESSOP 00
$<$ 52	90	[379] ALBRECHT	90B	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
$<$520	90	[380] BEBEK	87	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

[378] Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.
[379] ALBRECHT 90B limit assumes equal production of $B^0\overline{B}^0$ and B^+B^- at $\Upsilon(4S)$.
[380] BEBEK 87 reports $< 6.1\times10^{-3}$ assuming the $\Upsilon(4S)$ decays 43% to $B^0\overline{B}^0$. We rescale to 50%.

$\Gamma(\pi^+\pi^-\pi^+\pi^-)/\Gamma_{\text{total}}$ Γ_{175}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<2.3\times10^{-4}$	90	[381] ADAM	96D	DLPH	$e^+e^- \rightarrow Z$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<2.8\times10^{-4}$	90	[382] ABREU	95N	DLPH	Sup. by ADAM 96D
$<6.7\times10^{-4}$	90	[383] ALBRECHT	90B	ARG	$e^+e^- \rightarrow \Upsilon(4S)$

[381] ADAM 96D assumes $f_{B^0} = f_{B^-} = 0.39$ and $f_{B_s} = 0.12$.
[382] Assumes a B^0, B^- production fraction of 0.39 and a B_s production fraction of 0.12.
[383] ALBRECHT 90B limit assumes equal production of $B^0\overline{B}^0$ and B^+B^- at $\Upsilon(4S)$.

$\Gamma(\rho^0\rho^0)/\Gamma_{\text{total}}$ Γ_{176}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<1.8\times10^{-5}$	90	[384] GODANG	02	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<1.36\times10^{-4}$	90	[385] ABE	00C	SLD	$e^+e^- \rightarrow Z$
$<2.8\times10^{-4}$	90	[386] ALBRECHT	90B	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
$<2.9\times10^{-4}$	90	[387] BORTOLETTO	89	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
$<4.3\times10^{-4}$	90	[387] BEBEK	87	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

[384] Assumes a helicity 00 configuration. For a helicity 11 configuration, the limit decreases to 1.4×10^{-5}.
[385] ABE 00C assumes B($Z \rightarrow b\overline{b}$)=(21.7 ± 0.1)% and the B fractions $f_{B^0}=f_{B^+}=(39.7^{+1.8}_{-2.2})$% and $f_{B_s}=(10.5^{+1.8}_{-2.2})$%.
[386] ALBRECHT 90B limit assumes equal production of $B^0\overline{B}^0$ and B^+B^- at $\Upsilon(4S)$.
[387] Paper assumes the $\Upsilon(4S)$ decays 43% to $B^0\overline{B}^0$. We rescale to 50%.

$\Gamma(a_1(1260)^\mp\pi^\pm)/\Gamma_{\text{total}}$ Γ_{177}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<4.9\times10^{-4}$	90	[388] BORTOLETTO	89	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<6.3\times10^{-4}$	90	[389] ALBRECHT	90B	ARG	$e^+e^- \rightarrow \Upsilon(4S)$
$<1.0\times10^{-3}$	90	[388] BEBEK	87	CLEO	$e^+e^- \rightarrow \Upsilon(4S)$

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

$\Gamma(a_2(1320)^{\mp}\pi^{\pm})/\Gamma_{total}$ — Γ_{178}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<3.0\times10^{-4}$	90	[390] BORTOLETTO 89	CLEO	$e^+e^-\to\Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$<1.4\times10^{-3}$	90	[390] BEBEK 87	CLEO	$e^+e^-\to\Upsilon(4S)$

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

$\Gamma(\pi^+\pi^-\pi^0\pi^0)/\Gamma_{total}$ — Γ_{179}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<3.1\times10^{-3}$	90	[391] ALBRECHT 90B	ARG	$e^+e^-\to\Upsilon(4S)$

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

$\Gamma(\rho^+\rho^-)/\Gamma_{total}$ — Γ_{180}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<2.2\times10^{-3}$	90	[392] ALBRECHT 90B	ARG	$e^+e^-\to\Upsilon(4S)$

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

$\Gamma(a_1(1260)^0\pi^0)/\Gamma_{total}$ — Γ_{181}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<1.1\times10^{-3}$	90	[393] ALBRECHT 90B	ARG	$e^+e^-\to\Upsilon(4S)$

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

$\Gamma(\omega\pi^0)/\Gamma_{total}$ — Γ_{182}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<3\times10^{-6}$	90	[394] AUBERT 01G	BABR	$e^+e^-\to\Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$<5.5\times10^{-6}$	90	[394] JESSOP 00	CLE2	$e^+e^-\to\Upsilon(4S)$
$<1.4\times10^{-5}$	90	[394] BERGFELD 98	CLE2	Repl. by JESSOP 00
$<4.6\times10^{-4}$	90	[395] ALBRECHT 90B	ARG	$e^+e^-\to\Upsilon(4S)$

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

$\Gamma(\pi^+\pi^+\pi^-\pi^-\pi^0)/\Gamma_{total}$ — Γ_{183}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<9.0\times10^{-3}$	90	[396] ALBRECHT 90B	ARG	$e^+e^-\to\Upsilon(4S)$

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

$\Gamma(a_1(1260)^+\rho^-)/\Gamma_{total}$ — Γ_{184}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<3.4\times10^{-3}$	90	[397] ALBRECHT 90B	ARG	$e^+e^-\to\Upsilon(4S)$

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

$\Gamma(a_1(1260)^0\rho^0)/\Gamma_{total}$ — Γ_{185}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<2.4\times10^{-3}$	90	[398] ALBRECHT 90B	ARG	$e^+e^-\to\Upsilon(4S)$

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

$\Gamma(\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-)/\Gamma_{total}$ — Γ_{186}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<3.0 \times 10^{-3}$	90	[399] ALBRECHT	90B	ARG	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma(a_1(1260)^+a_1(1260)^-)/\Gamma_{total}$ — Γ_{187}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<2.8 \times 10^{-3}$	90	[400] BORTOLETTO	89	CLEO	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<6.0 \times 10^{-3}$	90	[401] ALBRECHT	90B	ARG	$e^+e^- \to \Upsilon(4S)$

[400] BORTOLETTO 89 reports $< 3.2 \times 10^{-3}$ assuming the $\Upsilon(4S)$ decays 43% to $B^0\overline{B}^0$. We rescale to 50%.
[401] ALBRECHT 90B limit assumes equal production of $B^0\overline{B}^0$ and B^+B^- at $\Upsilon(4S)$.

$\Gamma(\pi^+\pi^+\pi^+\pi^-\pi^-\pi^-\pi^0)/\Gamma_{total}$ — Γ_{188}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<1.1 \times 10^{-2}$	90	[402] ALBRECHT	90B	ARG	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma(p\overline{p})/\Gamma_{total}$ — Γ_{189}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<1.2 \times 10^{-6}$	90	[403] ABE	02O	BELL	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<7.0 \times 10^{-6}$	90	[404] COAN	99	CLE2	$e^+e^- \to \Upsilon(4S)$
$<1.8 \times 10^{-5}$	90	[405] BUSKULIC	96V	ALEP	$e^+e^- \to Z$
$<3.5 \times 10^{-4}$	90	[406] ABREU	95N	DLPH	Sup. by ADAM 96D
$<3.4 \times 10^{-5}$	90	[407] BORTOLETTO	89	CLEO	$e^+e^- \to \Upsilon(4S)$
$<1.2 \times 10^{-4}$	90	[408] ALBRECHT	88F	ARG	$e^+e^- \to \Upsilon(4S)$
$<1.7 \times 10^{-4}$	90	[407] BEBEK	87	CLEO	$e^+e^- \to \Upsilon(4S)$

[403] Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.
[404] Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.
[405] BUSKULIC 96V assumes PDG 96 production fractions for B^0, B^+, B_s, b baryons.
[406] Assumes a B^0, B^- production fraction of 0.39 and a B_s production fraction of 0.12.
[407] Paper assumes the $\Upsilon(4S)$ decays 43% to $B^0\overline{B}^0$. We rescale to 50%.
[408] ALBRECHT 88F reports $< 1.3 \times 10^{-4}$ assuming the $\Upsilon(4S)$ decays 45% to $B^0\overline{B}^0$. We rescale to 50%.

$\Gamma(p\overline{p}\pi^+\pi^-)/\Gamma_{total}$ — Γ_{190}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<2.5	90	[409] BEBEK	89	CLEO	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<9.5	90	[410] ABREU	95N	DLPH	Sup. by ADAM 96D
$5.4 \pm 1.8 \pm 2.0$		[411] ALBRECHT	88F	ARG	$e^+e^- \to \Upsilon(4S)$

[409] BEBEK 89 reports $< 2.9 \times 10^{-4}$ assuming the $\Upsilon(4S)$ decays 43% to $B^0\overline{B}^0$. We rescale to 50%.
[410] Assumes a B^0, B^- production fraction of 0.39 and a B_s production fraction of 0.12.
[411] ALBRECHT 88F reports $6.0 \pm 2.0 \pm 2.2$ assuming the $\Upsilon(4S)$ decays 45% to $B^0\overline{B}^0$. We rescale to 50%.

$\Gamma(p\overline{p}K^0)/\Gamma_{total}$ — Γ_{191}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<7.2\times10^{-6}$	90	[412,413] ABE	02K	BELL	$e^+e^-\to\Upsilon(4S)$

[412] Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.
[413] Explicitly vetoes resonant production of $p\overline{p}$ from Charmonium states.

$\Gamma(p\overline{\Lambda}\pi^-)/\Gamma_{total}$ — Γ_{192}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<1.3\times10^{-5}$	90	[414] COAN	99	CLE2	$e^+e^-\to\Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<1.8\times10^{-4}$	90	[415] ALBRECHT	88F	ARG	$e^+e^-\to\Upsilon(4S)$

[414] Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.
[415] ALBRECHT 88F reports $<2.0\times10^{-4}$ assuming the $\Upsilon(4S)$ decays 45% to $B^0\overline{B}^0$. We rescale to 50%.

$\Gamma(\overline{\Lambda}\Lambda)/\Gamma_{total}$ — Γ_{193}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<1.0\times10^{-6}$	90	[416] ABE	02O	BELL	$e^+e^-\to\Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<3.9\times10^{-6}$	90	[417] COAN	99	CLE2	$e^+e^-\to\Upsilon(4S)$

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

$\Gamma(\Delta^0\overline{\Delta}^0)/\Gamma_{total}$ — Γ_{194}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0015	90	[418] BORTOLETTO	89	CLEO	$e^+e^-\to\Upsilon(4S)$

[418] BORTOLETTO 89 reports <0.0018 assuming $\Upsilon(4S)$ decays 43% to $B^0\overline{B}^0$. We rescale to 50%.

$\Gamma(\Delta^{++}\Delta^{--})/\Gamma_{total}$ — Γ_{195}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<1.1\times10^{-4}$	90	[419] BORTOLETTO	89	CLEO	$e^+e^-\to\Upsilon(4S)$

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

$\Gamma(\overline{D}^0p\overline{p})/\Gamma_{total}$ — Γ_{196}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
$(1.18\pm0.15\pm0.16)\times10^{-4}$	[420] ABE	02W	BELL	$e^+e^-\to\Upsilon(4S)$

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

$\Gamma(\overline{D}^*(2007)^0p\overline{p})/\Gamma_{total}$ — Γ_{197}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
$(1.20^{+0.33}_{-0.29}\pm0.21)\times10^{-4}$	[421] ABE	02W	BELL	$e^+e^-\to\Upsilon(4S)$

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

$\Gamma(\overline{\Sigma}_c^{--}\Delta^{++})/\Gamma_{total}$ — Γ_{198}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0010	90	[422] PROCARIO	94	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

[422] PROCARIO 94 reports < 0.0012 for $B(\Lambda_c^+ \rightarrow pK^-\pi^+) = 0.043$. We rescale to our best value $B(\Lambda_c^+ \rightarrow pK^-\pi^+) = 0.050$.

$\Gamma(\overline{\Lambda}_c^- p\pi^+\pi^-)/\Gamma_{total}$ — Γ_{199}/Γ

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
1.3 ±0.4 OUR AVERAGE				
1.7 ±0.3 ±0.4	[423] DYTMAN	02	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
1.10±0.20±0.29	[424] GABYSHEV	02	BELL	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$1.33^{+0.46}_{-0.42}\pm0.37$	[425] FU	97	CLE2	Repl. by DYTMAN 02

[423] DYTMAN 02 reports $1.67^{+0.27}_{-0.25}$ for $B(\Lambda_c^+ \rightarrow pK^-\pi^+) = 0.05$. We rescale to our best value $B(\Lambda_c^+ \rightarrow pK^-\pi^+) = (5.0 \pm 1.3) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[424] GABYSHEV 02 reports 1.1 ± 0.2 for $B(\Lambda_c^+ \rightarrow pK^-\pi^+) = 0.05$. We rescale to our best value $B(\Lambda_c^+ \rightarrow pK^-\pi^+) = (5.0 \pm 1.3) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[425] FU 97 uses PDG 96 values of Λ_c branching fraction.

$\Gamma(\overline{\Lambda}_c^- p)/\Gamma_{total}$ — Γ_{200}/Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID		TECN	COMMENT
$\mathbf{2.19^{+0.56}_{-0.49}\pm0.65}$		[426,427] GABYSHEV	03	BELL	$e^+e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
< 9	90	[426,428] DYTMAN	02	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
< 3.1	90	[426,429] GABYSHEV	02	BELL	$e^+e^- \rightarrow \Upsilon(4S)$
<21	90	[430] FU	97	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

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

[427] The second error for GABYSHEV 03 includes the systematic and the error of $\Lambda_c \rightarrow \overline{p}K^+\pi^-$ decay branching fraction.

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

[429] Uses the value for $\Lambda_c \rightarrow pK^-\pi^+$ branching ratio $(5.0 \pm 1.3)\%$.

[430] FU 97 uses PDG 96 values of Λ_c branching ratio.

$\Gamma(\overline{\Lambda}_c^- p\pi^0)/\Gamma_{total}$ — Γ_{201}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$\mathbf{<5.9\times10^{-4}}$	90	[431] FU	97	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

[431] FU 97 uses PDG 96 values of Λ_c branching ratio.

$\Gamma(\overline{\Lambda}_c^- p\pi^+\pi^-\pi^0)/\Gamma_{total}$ — Γ_{202}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$\mathbf{<5.07\times10^{-3}}$	90	[432] FU	97	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

[432] FU 97 uses PDG 96 values of Λ_c branching ratio.

$\Gamma(\overline{\Lambda}_c^- p\pi^+\pi^-\pi^+\pi^-)/\Gamma_{total}$ Γ_{203}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<2.74 × 10^{-3}	90	[433] FU	97	CLE2	$e^+e^- \to \Upsilon(4S)$

[433] FU 97 uses PDG 96 values of Λ_c branching ratio.

$\Gamma(\overline{\Sigma}_c(2520)^{--} p\pi^+)/\Gamma_{total}$ Γ_{204}/Γ

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
1.6±0.6±0.4	[434] GABYSHEV	02	BELL	$e^+e^- \to \Upsilon(4S)$

[434] GABYSHEV 02 reports $1.63^{+0.64}_{-0.58}$ for B($\Lambda_c^+ \to pK^-\pi^+$) = 0.05. We rescale to our best value B($\Lambda_c^+ \to pK^-\pi^+$) = $(5.0 \pm 1.3) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\overline{\Sigma}_c(2520)^0 p\pi^-)/\Gamma_{total}$ Γ_{205}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<1.21 × 10^{-4}	90	[435,436] GABYSHEV	02	BELL	$e^+e^- \to \Upsilon(4S)$

[435] Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.
[436] Uses the value for $\Lambda_c \to pK^-\pi^+$ branching ratio (5.0 ± 1.3)%.

$\Gamma(\overline{\Sigma}_c(2455)^0 p\pi^-)/\Gamma_{total}$ Γ_{206}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
1.0±0.8 OUR AVERAGE	Error includes scale factor of 1.7.				
2.2±0.7±0.6		[437] DYTMAN	02	CLE2	$e^+e^- \to \Upsilon(4S)$
$0.5^{+0.5}_{-0.4}$±0.1	90	[438] GABYSHEV	02	BELL	$e^+e^- \to \Upsilon(4S)$

[437] DYTMAN 02 reports 2.2 ± 0.7 for B($\Lambda_c^+ \to pK^-\pi^+$) = 0.05. We rescale to our best value B($\Lambda_c^+ \to pK^-\pi^+$) = $(5.0 \pm 1.3) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.
[438] GABYSHEV 02 reports $0.48^{+0.46}_{-0.41}$ for B($\Lambda_c^+ \to pK^-\pi^+$) = 0.05. We rescale to our best value B($\Lambda_c^+ \to pK^-\pi^+$) = $(5.0 \pm 1.3) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\Sigma_c(2455)^{--} p\pi^+)/\Gamma_{total}$ Γ_{207}/Γ

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
2.8±0.9 OUR AVERAGE				
3.7±1.1±1.0	[439] DYTMAN	02	CLE2	$e^+e^- \to \Upsilon(4S)$
2.4±0.7±0.6	[440] GABYSHEV	02	BELL	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma(\Lambda_{c1}^- p)/\Gamma_{total}$ — Γ_{208}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<1.1 × 10^{-4}	90	[441,442] DYTMAN	02	CLE2	$e^+e^- \to \Upsilon(4S)$

[441] Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.
[442] DYTMAN 02 measurement uses B($\Lambda_c^- \to \overline{p}K^+\pi^-$) = 5.0 ± 1.3%. The second error includes the systematic and the uncertainty of the branching ratio.

$\Gamma(\gamma\gamma)/\Gamma_{total}$ — Γ_{209}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<1.7 × 10^{-6}	90	[443] AUBERT	01I	BABR	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<3.9 × 10^{-5}	90	[444] ACCIARRI	95I	L3	$e^+e^- \to Z$

[443] Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.
[444] ACCIARRI 95I assumes f_{B^0} = 39.5 ± 4.0 and f_{B_s} = 12.0 ± 3.0%.

$\Gamma(e^+e^-)/\Gamma_{total}$ — Γ_{210}/Γ

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<8.3 × 10^{-7}	90	[445] BERGFELD	00B	CLE2	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<1.4 × 10^{-5}	90	[446] ACCIARRI	97B	L3	$e^+e^- \to Z$
<5.9 × 10^{-6}	90	AMMAR	94	CLE2	Repl. by BERGFELD 00B
<2.6 × 10^{-5}	90	[447] AVERY	89B	CLEO	$e^+e^- \to \Upsilon(4S)$
<7.6 × 10^{-5}	90	[448] ALBRECHT	87D	ARG	$e^+e^- \to \Upsilon(4S)$
<6.4 × 10^{-5}	90	[449] AVERY	87	CLEO	$e^+e^- \to \Upsilon(4S)$
<3 × 10^{-4}	90	GILES	84	CLEO	Repl. by AVERY 87

[445] Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.
[446] ACCIARRI 97B assume PDG 96 production fractions for B^+, B^0, B_s, and Λ_b.
[447] AVERY 89B reports $< 3 \times 10^{-5}$ assuming the $\Upsilon(4S)$ decays 43% to $B^0\overline{B}^0$. We rescale to 50%.
[448] ALBRECHT 87D reports $< 8.5 \times 10^{-5}$ assuming the $\Upsilon(4S)$ decays 45% to $B^0\overline{B}^0$. We rescale to 50%.
[449] AVERY 87 reports $< 8 \times 10^{-5}$ assuming the $\Upsilon(4S)$ decays 40% to $B^0\overline{B}^0$. We rescale to 50%.

$\Gamma(\mu^+\mu^-)/\Gamma_{total}$ — Γ_{211}/Γ

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<6.1 × 10^{-7}	90	[450] BERGFELD	00B	CLE2	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<4.0 × 10^{-5}	90	ABBOTT	98B	D0	$p\overline{p}$ 1.8 TeV
<6.8 × 10^{-7}	90	[451] ABE	98	CDF	$p\overline{p}$ at 1.8 TeV
<1.0 × 10^{-5}	90	[452] ACCIARRI	97B	L3	$e^+e^- \to Z$
<1.6 × 10^{-6}	90	[453] ABE	96L	CDF	Repl. by ABE 98
<5.9 × 10^{-6}	90	AMMAR	94	CLE2	$e^+e^- \to \Upsilon(4S)$
<8.3 × 10^{-6}	90	[454] ALBAJAR	91C	UA1	$E_{cm}^{p\overline{p}}$= 630 GeV

$<1.2 \times 10^{-5}$	90	[455] ALBAJAR	91C	UA1	$E_{cm}^{p\overline{p}}$= 630 GeV
$<4.3 \times 10^{-5}$	90	[456] AVERY	89B	CLEO	$e^+ e^- \rightarrow \Upsilon(4S)$
$<4.5 \times 10^{-5}$	90	[457] ALBRECHT	87D	ARG	$e^+ e^- \rightarrow \Upsilon(4S)$
$<7.7 \times 10^{-5}$	90	[458] AVERY	87	CLEO	$e^+ e^- \rightarrow \Upsilon(4S)$
$<2 \times 10^{-4}$	90	GILES	84	CLEO	Repl. by AVERY 87

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

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

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

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

[454] B^0 and B_s^0 are not separated.

[455] Obtained from unseparated B^0 and B_s^0 measurement by assuming a B^0:B_s^0 ratio 2:1.

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

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

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

$\Gamma(K^0 e^+ e^-)/\Gamma_{total}$ — Γ_{212}/Γ

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<2.7 \times 10^{-6}$	90	[459] ABE	02	BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<3.8 \times 10^{-6}$	90	[459] AUBERT	02L	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
$<8.45 \times 10^{-6}$	90	[460] ANDERSON	01B	CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$
$<3.0 \times 10^{-4}$	90	ALBRECHT	91E	ARG	$e^+ e^- \rightarrow \Upsilon(4S)$
$<5.2 \times 10^{-4}$	90	[461] AVERY	87	CLEO	$e^+ e^- \rightarrow \Upsilon(4S)$

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

[460] The result is for di-lepton masses above 0.5 GeV.

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

$\Gamma(K^0 \mu^+ \mu^-)/\Gamma_{total}$ — Γ_{213}/Γ

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<3.3 \times 10^{-6}$	90	[462] ABE	02	BELL	$e^+ e^- \rightarrow \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<3.6 \times 10^{-6}$	90	AUBERT	02L	BABR	$e^+ e^- \rightarrow \Upsilon(4S)$
$<6.64 \times 10^{-6}$	90	[463] ANDERSON	01B	CLE2	$e^+ e^- \rightarrow \Upsilon(4S)$
$<5.2 \times 10^{-4}$	90	ALBRECHT	91E	ARG	$e^+ e^- \rightarrow \Upsilon(4S)$
$<3.6 \times 10^{-4}$	90	[464] AVERY	87	CLEO	$e^+ e^- \rightarrow \Upsilon(4S)$

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

[463] The result is for di-lepton masses above 0.5 GeV.

[464] AVERY 87 reports $< 4.5 \times 10^{-4}$ assuming the $\Upsilon(4S)$ decays 40% to $B^0 \overline{B}^0$. We rescale to 50%.

$\Gamma\big(K^*(892)^0 e^+ e^-\big)/\Gamma_{\text{total}}$ Γ_{214}/Γ

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<6.4 × 10^{-6}	90	[465] ABE	02	BELL	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<6.7 \times 10^{-6}$	90	[465] AUBERT	02L	BABR	$e^+e^- \to \Upsilon(4S)$
$<2.9 \times 10^{-4}$	90	ALBRECHT	91E	ARG	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma\big(K^*(892)^0 \mu^+ \mu^-\big)/\Gamma_{\text{total}}$ Γ_{215}/Γ

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<3.3 × 10^{-6}	90	AUBERT	02L	BABR	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<4.2 \times 10^{-6}$	90	[466] ABE	02	BELL	$e^+e^- \to \Upsilon(4S)$
$<4.0 \times 10^{-6}$	90	[467] AFFOLDER	99B	CDF	$p\overline{p}$ at 1.8 TeV
$<2.5 \times 10^{-5}$	90	[468] ABE	96L	CDF	Repl. by AFFOLDER 99B
$<2.3 \times 10^{-5}$	90	[469] ALBAJAR	91C	UA1	$E_{\text{cm}}^{p\overline{p}} = 630$ GeV
$<3.4 \times 10^{-4}$	90	ALBRECHT	91E	ARG	$e^+e^- \to \Upsilon(4S)$

[466] Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.
[467] AFFOLDER 99B measured relative to $B^0 \to J/\psi(1S) K^*(892)^0$.
[468] ABE 96L measured relative to $B^0 \to J/\psi(1S) K^*(892)^0$ using PDG 94 branching ratios.
[469] ALBAJAR 91C assumes 36% of $\overline{b}$ quarks give B^0 mesons.

$\Gamma\big(K^*(892)^0 \nu\overline{\nu}\big)/\Gamma_{\text{total}}$ Γ_{216}/Γ

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<1.0 × 10^{-3}	90	[470] ADAM	96D	DLPH	$e^+e^- \to Z$

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

$\Gamma\big(e^\pm \mu^\mp\big)/\Gamma_{\text{total}}$ Γ_{217}/Γ

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<15 × 10^{-7}	90	[471] BERGFELD	00B	CLE2	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$< 3.5 \times 10^{-6}$	90	ABE	98V	CDF	$p\overline{p}$ at 1.8 TeV
$< 1.6 \times 10^{-5}$	90	[472] ACCIARRI	97B	L3	$e^+e^- \to Z$
$< 5.9 \times 10^{-6}$	90	AMMAR	94	CLE2	$e^+e^- \to \Upsilon(4S)$
$< 3.4 \times 10^{-5}$	90	[473] AVERY	89B	CLEO	$e^+e^- \to \Upsilon(4S)$
$< 4.5 \times 10^{-5}$	90	[474] ALBRECHT	87D	ARG	$e^+e^- \to \Upsilon(4S)$
$< 7.7 \times 10^{-5}$	90	[475] AVERY	87	CLEO	$e^+e^- \to \Upsilon(4S)$
$< 3 \times 10^{-4}$	90	GILES	84	CLEO	Repl. by AVERY 87

[471] Assumes equal production of B^+ and B^0 at the $\Upsilon(4S)$.
[472] ACCIARRI 97B assume PDG 96 production fractions for B^+, B^0, B_s, and Λ_b.
[473] Paper assumes the $\Upsilon(4S)$ decays 43% to $B^0\overline{B}^0$. We rescale to 50%.
[474] ALBRECHT 87D reports $< 5 \times 10^{-5}$ assuming the $\Upsilon(4S)$ decays 45% to $B^0\overline{B}^0$. We rescale to 50%.
[475] AVERY 87 reports $< 9 \times 10^{-5}$ assuming the $\Upsilon(4S)$ decays 40% to $B^0\overline{B}^0$. We rescale to 50%.

$\Gamma(K^0 e^\pm \mu^\mp)/\Gamma_{total}$ — Γ_{218}/Γ

Test of lepton family number conservation.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<4.0 \times 10^{-6}$	90	[476] AUBERT	02L	BABR	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma(K^*(892)^0 e^\pm \mu^\mp)/\Gamma_{total}$ — Γ_{219}/Γ

Test of lepton family number conservation.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<3.4 \times 10^{-6}$	90	[477] AUBERT	02L	BABR	$e^+e^- \to \Upsilon(4S)$

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

$\Gamma(e^\pm \tau^\mp)/\Gamma_{total}$ — Γ_{220}/Γ

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<5.3 \times 10^{-4}$	90	AMMAR	94	CLE2	$e^+e^- \to \Upsilon(4S)$

$\Gamma(\mu^\pm \tau^\mp)/\Gamma_{total}$ — Γ_{221}/Γ

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<8.3 \times 10^{-4}$	90	AMMAR	94	CLE2	$e^+e^- \to \Upsilon(4S)$

POLARIZATION IN B^0 DECAY

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

$\Gamma_L/\Gamma = 1$ would indicate that $B^0 \to J/\psi(1S) K^*(892)^0$ followed by $K^*(892)^0 \to K^0_S \pi^0$ is a pure CP eigenstate with $CP = -1$.

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.605±0.022 OUR AVERAGE					
$0.62 \pm 0.02 \pm 0.03$		[478] ABE	02N	BELL	$e^+e^- \to \Upsilon(4S)$
$0.597 \pm 0.028 \pm 0.024$		[479] AUBERT	01H	BABR	$e^+e^- \to \Upsilon(4S)$
$0.59 \pm 0.06 \pm 0.01$		[480] AFFOLDER	00N	CDF	$p\overline{p}$ at 1.8 TeV
$0.52 \pm 0.07 \pm 0.04$		[481] JESSOP	97	CLE2	$e^+e^- \to \Upsilon(4S)$
$0.65 \pm 0.10 \pm 0.04$	65	ABE	95Z	CDF	$p\overline{p}$ at 1.8 TeV
$0.97 \pm 0.16 \pm 0.15$	13	[482] ALBRECHT	94G	ARG	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$0.80 \pm 0.08 \pm 0.05$	42	[482] ALAM	94	CLE2	Sup. by JESSOP 97

[478] Averaged over an admixture of B^0 and B^+ decays and the P wave fraction is $(19 \pm 2 \pm 3)\%$.

[479] Averaged over an admixture of B^0 and B^- decays and the P wave fraction is $(16.0 \pm 3.2 \pm 1.4) \times 10^{-2}$.

[480] AFFOLDER 00N measurements are based on 190 B^0 candidates obtained from a data sample of 89 pb^{-1}. The P-wave fraction is found to be $0.13^{+0.12}_{-0.09} \pm 0.06$.

[481] JESSOP 97 is the average over a mixture of B^0 and B^+ decays. The P-wave fraction is found to be $0.16 \pm 0.08 \pm 0.04$.

[482] Averaged over an admixture of B^0 and B^+ decays.

Γ_L/Γ in $B^0 \to \psi(2S) K^*(892)^0$

VALUE	*DOCUMENT ID*		*TECN*	*COMMENT*
$0.45 \pm 0.11 \pm 0.04$	[483] RICHICHI	01	CLE2	$e^+e^- \to \Upsilon(4S)$

[483] Averages between charged and neutral B mesons.

Γ_L/Γ in $B^0 \to D_s^{*+} D^{*-}$

VALUE	*DOCUMENT ID*		*TECN*	*COMMENT*
$0.506 \pm 0.139 \pm 0.036$	AHMED	00B	CLE2	$e^+e^- \to \Upsilon(4S)$

Γ_L/Γ in $B^0 \to D^{*-} \rho^+$

VALUE	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
$0.93 \pm 0.05 \pm 0.05$	76	ALAM	94	CLE2	$e^+e^- \to \Upsilon(4S)$

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

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

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

$$\chi_d = \frac{x_d^2}{2(1+x_d^2)}$$

$$x_d = \frac{\Delta m_{B^0}}{\Gamma_{B^0}} = (m_{B^0_H} - m_{B^0_L})\, \tau_{B^0} \,,$$

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

χ_d

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

$$\chi_d = \Gamma(B^0 \to \ell^- X \text{ (via } \overline{B}^0))/\Gamma(B^0 \to \ell^\pm X)$$
$$= \Gamma(\overline{B}^0 \to \ell^+ X \text{ (via } B^0))/\Gamma(\overline{B}^0 \to \ell^\pm X)$$

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

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

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

OUR EVALUATION, provided by the Heavy Flavor Averaging Group (HFAG), includes χ_d calculated from Δm_{B^0} and τ_{B^0}.

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
0.186±0.004 OUR EVALUATION					
0.182±0.015 OUR AVERAGE					
0.198±0.013±0.014		[484] BEHRENS	00B	CLE2	$e^+e^- \to \Upsilon(4S)$
0.16 ±0.04 ±0.04		[485] ALBRECHT	94	ARG	$e^+e^- \to \Upsilon(4S)$
0.149±0.023±0.022		[486] BARTELT	93	CLE2	$e^+e^- \to \Upsilon(4S)$
0.171±0.048		[487] ALBRECHT	92L	ARG	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.20 ±0.13 ±0.12		[488] ALBRECHT	96D	ARG	$e^+e^- \to \Upsilon(4S)$
0.19 ±0.07 ±0.09		[489] ALBRECHT	96D	ARG	$e^+e^- \to \Upsilon(4S)$
0.24 ±0.12		[490] ELSEN	90	JADE	e^+e^- 35–44 GeV
$0.158^{+0.052}_{-0.059}$		ARTUSO	89	CLEO	$e^+e^- \to \Upsilon(4S)$
0.17 ±0.05		[491] ALBRECHT	87I	ARG	$e^+e^- \to \Upsilon(4S)$
<0.19	90	[492] BEAN	87B	CLEO	$e^+e^- \to \Upsilon(4S)$
<0.27	90	[493] AVERY	84	CLEO	$e^+e^- \to \Upsilon(4S)$

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

[485] ALBRECHT 94 reports r=0.194 ± 0.062 ± 0.054. We convert to χ for comparison. Uses tagged events (lepton + pion from D^*).

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

[487] ALBRECHT 92L is a combined measurement employing several lepton-based techniques. It uses all previous ARGUS data in addition to new data and therefore supersedes ALBRECHT 87I. A value of $r = 20.6 \pm 7.0\%$ is directly measured. The value can be used to measure $x = \Delta M/\Gamma = 0.72 \pm 0.15$ for the B_d meson. Assumes $f_{+-}/f_0 = 1.0 \pm 0.05$ and uses $\tau_{B^\pm}/\tau_{B^0} = (0.95 \pm 0.14)\ (f_{+-}/f_0)$.

[488] Uses $D^{*+}K^\pm$ correlations.

[489] Uses $(D^{*+}\ell^-)\ K^\pm$ correlations.

[490] These experiments see a combination of B_s and B_d mesons.

[491] ALBRECHT 87I is inclusive measurement with like-sign dileptons, with tagged B decays plus leptons, and one fully reconstructed event. Measures r=0.21 ± 0.08. We convert to χ for comparison. Superseded by ALBRECHT 92L.

[492] BEAN 87B measured $r <$ 0.24; we converted to χ.
[493] Same-sign dilepton events. Limit assumes semileptonic BR for B^+ and B^0 equal. If $B^0/B^{\pm}$ ratio <0.58, no limit exists. The limit was corrected in BEAN 87B from $r <$ 0.30 to $r <$ 0.37. We converted this limit to χ.

$\Delta m_{B^0} = m_{B^0_H} - m_{B^0_L}$

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

The second "OUR EVALUATION" (0.502 $\pm$ 0.079) is an average of the data listed below performed by the Heavy Flavor Averaging Group (HFAG) as described in our "Review of B-$\overline{B}$ Mixing" in the B^0 Section of these Listings. The averaging procedure takes into account correlations between the measurements.

The first "OUR EVALUATION" (0.502 $\pm$ 0.007), also provided by the HFAG, includes Δm_d calculated from χ_d measured at $\Upsilon(4S)$.

VALUE (10^{12} $\hbar$ s^{-1})	EVTS	DOCUMENT ID		TECN	COMMENT
0.502±0.007 OUR EVALUATION	First				
0.502±0.007 OUR EVALUATION	Second				
$0.531 \pm 0.025 \pm 0.007$		[494] ABDALLAH	03B	DLPH	$e^+e^- \rightarrow Z$
$0.492 \pm 0.018 \pm 0.013$		[495] AUBERT	03C	BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$0.503 \pm 0.008 \pm 0.010$		[496] HASTINGS	03	BELL	$e^+e^- \rightarrow \Upsilon(4S)$
$0.509 \pm 0.017 \pm 0.020$		[497] ZHENG	03	BELL	$e^+e^- \rightarrow \Upsilon(4S)$
$0.516 \pm 0.016 \pm 0.010$		[498] AUBERT	02I	BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$0.493 \pm 0.012 \pm 0.009$		[499] AUBERT	02J	BABR	$e^+e^- \rightarrow \Upsilon(4S)$
$0.494 \pm 0.012 \pm 0.015$		[500] HARA	02	BELL	$e^+e^- \rightarrow \Upsilon(4S)$
$0.528 \pm 0.017 \pm 0.011$		[501] TOMURA	02	BELL	$e^+e^- \rightarrow \Upsilon(4S)$
$0.497 \pm 0.024 \pm 0.025$		[502] ABBIENDI,G	00B	OPAL	$e^+e^- \rightarrow Z$
$0.503 \pm 0.064 \pm 0.071$		[503] ABE	99K	CDF	$p\overline{p}$ at 1.8 TeV
$0.500 \pm 0.052 \pm 0.043$		[504] ABE	99Q	CDF	$p\overline{p}$ at 1.8 TeV
$0.516 \pm 0.099 {}^{+0.029}_{-0.035}$		[505] AFFOLDER	99C	CDF	$p\overline{p}$ at 1.8 TeV
$0.471 {}^{+0.078}_{-0.068} {}^{+0.033}_{-0.034}$		[506] ABE	98C	CDF	$p\overline{p}$ at 1.8 TeV
$0.458 \pm 0.046 \pm 0.032$		[507] ACCIARRI	98D	L3	$e^+e^- \rightarrow Z$
$0.437 \pm 0.043 \pm 0.044$		[508] ACCIARRI	98D	L3	$e^+e^- \rightarrow Z$
$0.472 \pm 0.049 \pm 0.053$		[509] ACCIARRI	98D	L3	$e^+e^- \rightarrow Z$
$0.523 \pm 0.072 \pm 0.043$		[510] ABREU	97N	DLPH	$e^+e^- \rightarrow Z$
$0.493 \pm 0.042 \pm 0.027$		[508] ABREU	97N	DLPH	$e^+e^- \rightarrow Z$
$0.499 \pm 0.053 \pm 0.015$		[511] ABREU	97N	DLPH	$e^+e^- \rightarrow Z$
$0.480 \pm 0.040 \pm 0.051$		[507] ABREU	97N	DLPH	$e^+e^- \rightarrow Z$
$0.444 \pm 0.029 {}^{+0.020}_{-0.017}$		[508] ACKERSTAFF	97U	OPAL	$e^+e^- \rightarrow Z$
$0.430 \pm 0.043 {}^{+0.028}_{-0.030}$		[507] ACKERSTAFF	97V	OPAL	$e^+e^- \rightarrow Z$
$0.482 \pm 0.044 \pm 0.024$		[512] BUSKULIC	97D	ALEP	$e^+e^- \rightarrow Z$
$0.404 \pm 0.045 \pm 0.027$		[508] BUSKULIC	97D	ALEP	$e^+e^- \rightarrow Z$
$0.452 \pm 0.039 \pm 0.044$		[507] BUSKULIC	97D	ALEP	$e^+e^- \rightarrow Z$
$0.539 \pm 0.060 \pm 0.024$		[513] ALEXANDER	96V	OPAL	$e^+e^- \rightarrow Z$
$0.567 \pm 0.089 {}^{+0.029}_{-0.023}$		[514] ALEXANDER	96V	OPAL	$e^+e^- \rightarrow Z$

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

$0.516\pm0.016\pm0.010$		[515] AUBERT	02N	BABR	$e^+e^- \to \Upsilon(4S)$
$0.463\pm0.008\pm0.016$		[499] ABE	01D	BELL	Repl. by HASTINGS 03
$0.444\pm0.028\pm0.028$		[516] ACCIARRI	98D	L3	$e^+e^- \to Z$
0.497 ± 0.035		[517] ABREU	97N	DLPH	$e^+e^- \to Z$
$0.467\pm0.022{}^{+0.017}_{-0.015}$		[518] ACKERSTAFF	97V	OPAL	$e^+e^- \to Z$
0.446 ± 0.032		[519] BUSKULIC	97D	ALEP	$e^+e^- \to Z$
$0.531{}^{+0.050}_{-0.046}\pm0.078$		[520] ABREU	96Q	DLPH	Sup. by ABREU 97N
$0.496{}^{+0.055}_{-0.051}\pm0.043$		[507] ACCIARRI	96E	L3	Repl. by ACCIARRI 98D
$0.548\pm0.050{}^{+0.023}_{-0.019}$		[521] ALEXANDER	96V	OPAL	$e^+e^- \to Z$
0.496 ± 0.046		[522] AKERS	95J	OPAL	Repl. by ACKERSTAFF 97V
$0.462{}^{+0.040}_{-0.053}{}^{+0.052}_{-0.035}$		[507] AKERS	95J	OPAL	Repl. by ACKERSTAFF 97V
$0.50\pm0.12\pm0.06$		[510] ABREU	94M	DLPH	Sup. by ABREU 97N
$0.508\pm0.075\pm0.025$		[513] AKERS	94C	OPAL	Repl. by ALEXANDER 96V
$0.57\pm0.11\pm0.02$	153	[514] AKERS	94H	OPAL	Repl. by ALEXANDER 96V
$0.50{}^{+0.07}_{-0.06}{}^{+0.11}_{-0.10}$		[507] BUSKULIC	94B	ALEP	Sup. by BUSKULIC 97D
$0.52{}^{+0.10}_{-0.11}{}^{+0.04}_{-0.03}$		[514] BUSKULIC	93K	ALEP	Sup. by BUSKULIC 97D

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

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

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

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

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

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

[500] Uses a tagged sample of B^0 decays reconstructed in the mode $B^0 \to D^*\ell\nu$.

[501] Uses a tagged sample of fully-reconstructed hadronic B^0 decays at $\Upsilon(4S)$.

[502] Data analyzed using partially reconsturcted $\overline{B}^0 \to D^{*+}\ell^-\overline{\nu}$ decay and a combination of flavor tags from the rest of the event.

[503] Uses di-muon events.

[504] Uses jet-charge and lepton-flavor tagging.

[505] Uses $\ell^- D^{*+}-\ell$ events.

[506] Uses π-B in the same side.

[507] Uses ℓ-ℓ.

[508] Uses ℓ-Q_{hem}.

[509] Uses ℓ-ℓ with impact parameters.

[510] Uses $D^{*\pm}$-Q_{hem}.

[511] Uses $\pi_s^{\pm}\ell$-Q_{hem}.

[512] Uses $D^{*\pm}$-ℓ/Q_{hem}.

[513] Uses $D^{*\pm}\ell$-Q_{hem}.

[514] Uses $D^{*\pm}$-ℓ.

[515] AUBERT 02N result based on the same analysis and data sample reported in AUBERT 02I.
[516] ACCIARRI 98D combines results from ℓ-ℓ, ℓ-Q_{hem}, and ℓ-ℓ with impact parameters.
[517] ABREU 97N combines results from $D^{*\pm}$-Q_{hem}, ℓ-Q_{hem}, $\pi_s^{\pm}\ell$-Q_{hem}, and ℓ-ℓ.
[518] ACKERSTAFF 97V combines results from ℓ-ℓ, ℓ-Q_{hem}, D^*-ℓ, and $D^{*\pm}$-Q_{hem}.
[519] BUSKULIC 97D combines results from $D^{*\pm}$-ℓ/Q_{hem}, ℓ-Q_{hem}, and ℓ-ℓ.
[520] ABREU 96Q analysis performed using lepton, kaon, and jet-charge tags.
[521] ALEXANDER 96V combines results from $D^{*\pm}$-ℓ and $D^{*\pm}\ell$-Q_{hem}.
[522] AKERS 95J combines results fromt charge measurement, $D^{*\pm}\ell$-Q_{hem} and ℓ-ℓ.

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

The second "OUR EVALUATION" (0.772 ± 0.013) is an average of the data listed in Δm_{B^0} section performed by the Heavy Flavor Averaging Group (HFAG) as described in our "Review of B-$\overline{B}$ Mixing" in the B^0 Section of these Listings. The averaging procedure takes into account correlations between the measurements.

The first "OUR EVALUATION" (0.771 ± 0.012), also provided by the HFAG, includes χ_d measured at $\Upsilon(4S)$.

VALUE	*DOCUMENT ID*
0.771±0.012 OUR EVALUATION	First
0.772±0.013 OUR EVALUATION	Second

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CP VIOLATION PARAMETERS

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

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

VALUE (units 10^{-3})	*DOCUMENT ID*		*TECN*	*COMMENT*
0.7± 3.2 OUR AVERAGE				
1.2± 2.9±3.6	[523] AUBERT	02K	BABR	$e^+e^- \rightarrow \Upsilon(4S)$
− 3 ± 7	[524] BARATE	01D	ALEP	$e^+e^- \rightarrow Z$
3.5±10.3±1.5	[525] JAFFE	01	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$
1 ±14 ±3	[526] ABBIENDI	99J	OPAL	$e^+e^- \rightarrow Z$
2 ± 7 ±3	[527] ACKERSTAFF	97U	OPAL	$e^+e^- \rightarrow Z$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
4 ±18 ±3	[528] BEHRENS	00B	CLE2	Repl. by JAFFE 01
< 45	[529] BARTELT	93	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

[523] AUBERT 02K uses the charge asymmetry in like-sign dilepton events.
[524] BARATE 01D measured by investigating time-dependent asymmetries in semileptonic and fully inclusive B^0_d decays.
[525] JAFFE 01 finds $a_{\ell\ell} = 0.013 \pm 0.050 \pm 0.005$ and combines with the previous BEHRENS 00B independent measurement.
[526] Data analyzed using the time-dependent asymmetry of inclusive B^0 decay. The production flavor of B^0 mesons is determined using both the jet charge and the charge of secondary vertex in the opposite hemisphere.

[527] ACKERSTAFF 97U assumes CPT and is based on measuring the charge asymmetry in a sample of B^0 decays defined by lepton and Q_{hem} tags. If CPT is not invoked, Re(ϵ_B) = $-0.006 \pm 0.010 \pm 0.006$ is found. The indirect CPT violation parameter is determined to Im(δB) = $-0.020 \pm 0.016 \pm 0.006$.

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

[529] BARTELT 93 finds $a_{\ell\ell} = 0.031 \pm 0.096 \pm 0.032$ which corresponds to $|a_{\ell\ell}| < 0.18$, which yields the above $|\mathrm{Re}(\epsilon_{B^0})/(1+|\epsilon_{B^0}|^2|$.

$A_{T/CP}$

$A_{T/CP}$ is defined as

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

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

VALUE	DOCUMENT ID		TECN	COMMENT
0.005±0.012±0.014	[530] AUBERT	02K	BABR	$e^+e^- \to \Upsilon(4S)$

[530] AUBERT 02K uses the charge asymmetry in like-sign dilepton events.

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

A_{CP} is defined as

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

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

VALUE	DOCUMENT ID		TECN	COMMENT
−0.09 ±0.04 OUR AVERAGE				
$-0.102 \pm 0.050 \pm 0.016$	[531] AUBERT	02Q	BABR	$e^+e^- \to \Upsilon(4S)$
$-0.06 \pm 0.09 {}^{+0.01}_{-0.02}$	[532] CASEY	02	BELL	$e^+e^- \to \Upsilon(4S)$
-0.04 ± 0.16	[533] CHEN	00	CLE2	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$-0.07 \pm 0.08 \pm 0.02$	[534] AUBERT	02D	BABR	Repl. by AUBERT 02Q
$0.044 {}^{+0.186}_{-0.167} {}^{+0.018}_{-0.021}$	[535] ABE	01K	BELL	Repl. by CASEY 02
$-0.19 \pm 0.10 \pm 0.03$	[536] AUBERT	01E	BABR	Repl. by AUBERT 02Q

[531] Corresponds to 90% confidence range $-0.188 < A_{CP} < -0.016$.

[532] Corresponds to 90% confidence range $-0.21 < A_{CP} < +0.09$.

[533] Corresponds to 90% confidence range $-0.30 < A_{CP} < 0.22$.

[534] Corresponds to 90% confidence range $-0.21 < A_{CP} < 0.07$.

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

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

$A_{CP}(B^0 \to \phi K^*(892)^0)$

VALUE	DOCUMENT ID		TECN	COMMENT
0.00±0.27±0.03	[537] AUBERT	02E	BABR	$e^+e^- \to \Upsilon(4S)$

[537] Corresponds to 90% confidence range $-0.44 < A_{CP} < 0.44$.

$C_{\pi\pi}$ ($B^0 \to \pi^+\pi^-$)

$C_{\pi\pi}$ is defined as $(1-|\lambda|^2)/(1+|\lambda|^2)$, where the quantity $\lambda = q/p\ \overline{A}_f/A_f$ is a phase convention independent observable quantity for the final state f. For details, see the note on "*CP* Violation in *B* Decay Standard Model Predictions" in the B^0 Particle Listings above.

VALUE	DOCUMENT ID		TECN	COMMENT
$\mathbf{-0.54 \pm 0.30}$ **OUR AVERAGE**	Error includes scale factor of 1.6.			
$-0.94^{+0.31}_{-0.25} \pm 0.09$	[538] ABE	02M	BELL	$e^+e^- \to \Upsilon(4S)$
$-0.30 \pm 0.25 \pm 0.04$	[539] AUBERT	02Q	BABR	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$-0.25^{+0.45}_{-0.47} \pm 0.14$	[540] AUBERT	02D	BABR	Repl. by AUBERT 02Q

[538] ABE 02M reports $A_{\pi\pi}$ which has oppostie sign to the convention used in this quantity ($C_{\pi\pi}$). We have done the conversion here.
[539] Corresponds to 90% confidence range $-0.72 < C_{\pi\pi} < 0.12$.
[540] Corresponds to 90% confidence range $-1.0 < C_{\pi\pi} < 0.47$.

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

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

VALUE	DOCUMENT ID		TECN	COMMENT
$\mathbf{-0.5^{+0.6}_{-0.5}}$ **OUR AVERAGE**	Error includes scale factor of 2.3.			
$-1.21^{+0.38}_{-0.27}{}^{+0.16}_{-0.13}$	ABE	02M	BELL	$e^+e^- \to \Upsilon(4S)$
$0.02 \pm 0.34 \pm 0.05$	[541] AUBERT	02Q	BABR	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.03^{+0.52}_{-0.56} \pm 0.11$	[542] AUBERT	02D	BABR	Repl. by AUBERT 02Q

[541] Corresponds to 90% confidence range $-0.54 < S_{\pi\pi} < 0.58$.
[542] Corresponds to 90% confidence range $-0.89 < S_{\pi\pi} < 0.85$.

$C_{\eta'(958)K}$ ($B^0 \to \eta'(958) K^0_S$)

VALUE	DOCUMENT ID		TECN	COMMENT
$\mathbf{-0.26 \pm 0.22 \pm 0.03}$	[543] ABE	03C	BELL	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$-0.13 \pm 0.32^{+0.06}_{-0.09}$	[543] CHEN	02B	BELL	Repl. by ABE 03C

[543] BELLE Collab. quotes $A_{\eta'(958)K^0_S}$ which is equal to $-C_{\eta'(958)K^0_S}$.

$S_{\eta'(958)K}$ ($B^0 \to \eta'(958) K^0_S$)

VALUE	DOCUMENT ID		TECN	COMMENT
$\mathbf{0.71 \pm 0.37^{+0.05}_{-0.06}}$	ABE	03C	BELL	$e^+e^- \to \Upsilon(4S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.28 \pm 0.55^{+0.07}_{-0.08}$	CHEN	02B	BELL	Repl. by ABE 03C

$C_{\phi K^0_S}$ ($B^0 \to \phi K^0_S$)

VALUE	DOCUMENT ID		TECN	COMMENT
0.56±0.41±0.16	[544] ABE	03C	BELL	$e^+e^- \to \Upsilon(4S)$

[544] BELLE Collab. quotes $A_{\phi K^0_S}$ which is equal to $-C_{\phi K^0_S}$.

$S_{\phi K^0_S}$ ($B^0 \to \phi K^0_S$)

VALUE	DOCUMENT ID		TECN	COMMENT
−0.73±0.64±0.22	ABE	03C	BELL	$e^+e^- \to \Upsilon(4S)$

$C_{K^+K^-K^0_S}$ ($B^0 \to K^+K^-K^0_S$)

VALUE	DOCUMENT ID		TECN	COMMENT
$\mathbf{0.40\pm0.33^{+0.28}_{-0.10}}$	[545] ABE	03C	BELL	$e^+e^- \to \Upsilon(4S)$

[545] BELLE Collab. quotes $A_{K^+K^-K^0_S}$ which is equal to $-C_{K^+K^-K^0_S}$.

$S_{K^+K^-K^0_S}$ ($B^0 \to K^+K^-K^0_S$)

VALUE	DOCUMENT ID		TECN	COMMENT
$\mathbf{-0.49\pm0.43^{+0.11}_{-0.35}}$	ABE	03C	BELL	$e^+e^- \to \Upsilon(4S)$

$|\lambda|$ ($B^0 \to c\overline{c}K^0$)

The same λ quantity, defined in the $C_{\pi\pi}$ datablock above.

"OUR EVALUATION" is an average of the data listed below performed by the Heavy Flavor Averaging Group (HFAG).

VALUE	DOCUMENT ID		TECN	COMMENT
0.949±0.045 OUR EVALUATION				
0.95 ±0.04 OUR AVERAGE				
0.950±0.049±0.025	[546] ABE	02Z	BELL	$e^+e^- \to \Upsilon(4S)$
0.948±0.051±0.030	[547] AUBERT	02P	BABR	$e^+e^- \to \Upsilon(4S)$

[546] Measured with both $\eta_f = \pm1$ samples.
[547] Measured with the high purity of $\eta_f = -1$ samples.

sin(2β)

For a discussion of *CP* violation, see the note on "*CP* Violation in *B* Decay Standard Model Predictions" in the B^0 Particle Listings above. $\sin(2\beta)$ is a measure of the *CP*-violating amplitude in the $B^0_d \to J/\psi(1S)K^0_S$.

"OUR EVALUATION" is an average of the data listed below performed by the Heavy Flavor Averaging Group (HFAG).

VALUE	DOCUMENT ID		TECN	COMMENT
0.731±0.056 OUR EVALUATION				
0.73 ±0.05 OUR AVERAGE				
0.719±0.074±0.035	[548] ABE	02Z	BELL	$e^+e^- \to \Upsilon(4S)$
0.741±0.067±0.034	[549] AUBERT	02P	BABR	$e^+e^- \to \Upsilon(4S)$
$0.79\ ^{+0.41}_{-0.44}$	[550] AFFOLDER	00C	CDF	$p\overline{p}$ at 1.8 TeV
$0.84\ ^{+0.82}_{-1.04}\pm0.16$	[551] BARATE	00Q	ALEP	$e^+e^- \to Z$
$3.2\ ^{+1.8}_{-2.0}\pm0.5$	[552] ACKERSTAFF	98Z	OPAL	$e^+e^- \to Z$

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

0.99 ± 0.14 ± 0.06	[553] ABE	02U	BELL	$e^+e^- \rightarrow \Upsilon(4S)$
0.59 ± 0.14 ± 0.05	[554] AUBERT	02N	BABR	$e^+e^- \rightarrow \Upsilon(4S)$
0.58 $^{+0.32}_{-0.34}$ $^{+0.09}_{-0.10}$	ABASHIAN	01	BELL	Repl. by ABE 01G
0.99 ± 0.14 ± 0.06	[555] ABE	01G	BELL	Repl by ABE 02Z
0.34 ± 0.20 ± 0.05	AUBERT	01	BABR	Repl. by AUBERT 01B
0.59 ± 0.14 ± 0.05	[555] AUBERT	01B	BABR	Repl. by AUBERT 02P
1.8 ± 1.1 ± 0.3	[556] ABE	98U	CDF	Repl. by AFFOLDER 00C

[548] ABE 02Z result is based on 85×10^6 $B\overline{B}$ pairs.

[549] AUBERT 02P result is based on 88×10^6 $B\overline{B}$ pairs.

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

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

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

[553] ABE 02U result is based on the same analysis and data sample reported in ABE 01G.

[554] AUBERT 02N result based on the same analysis and data sample reported in AUBERT 01B.

[555] First observation of CP violation in B^0 meson system.

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

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

R_1 (form factor ratio $\sim V/A_1$)

VALUE	*DOCUMENT ID*		*TECN*	*COMMENT*
1.18±0.30±0.12	DUBOSCQ	96	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

R_2 (form factor ratio $\sim A_2/A_1$)

VALUE	*DOCUMENT ID*		*TECN*	*COMMENT*
0.71±0.22±0.07	DUBOSCQ	96	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

$\rho^2_{A_1}$ (form factor slope)

VALUE	*DOCUMENT ID*		*TECN*	*COMMENT*
0.91±0.15±0.06	DUBOSCQ	96	CLE2	$e^+e^- \rightarrow \Upsilon(4S)$

B^0 REFERENCES

ABDALLAH	03B	EPJ C (to be publ.)	J. Abdallah *et al.*	(DELPHI Collab.)
CERN-EP-2002-078, hep-ex/0303032				
ABE	03B	PR D67 032003	K. Abe *et al.*	(BELLE Collab.)
ABE	03C	PR D67 031102R	K. Abe *et al.*	(BELLE Collab.)
ADAM	03	PR D67 032001	N.E. Adam *et al.*	(CLEO Collab.)
AUBERT	03B	PRL 90 091801	B. Aubert *et al.*	(BaBar Collab.)
AUBERT	03C	PR D67 072002	B. Aubert *et al.*	(BaBar Collab.)
AUBERT	03D	PRL 90 181803	B. Aubert *et al.*	(BaBar Collab.)
FANG	03	PRL 90 071801	F. Fang *et al.*	(BELLE Collab.)
GABYSHEV	03	PRL 90 121802	N. Gabyshev *et al.*	(BELLE Collab.)
HASTINGS	03	PR D66 052004	N.C. Hastings *et al.*	(BELLE Collab.)
KROKOVNY	03	PRL 90 141802	P. Krokovny *et al.*	(BELLE Collab.)
SATPATHY	03	PL B553 159	A. Satpathy *et al.*	(BELLE Collab.)
ZHENG	03	PR D (to be publ.)	Y. Zheng *et al.*	(BELLE Collab.)
hep-ex/0211065				
ABE	02	PRL 88 021801	K. Abe *et al.*	(BELLE Collab.)
ABE	02E	PL B526 258	K. Abe *et al.*	(BELLE Collab.)
ABE	02F	PL B526 247	K. Abe *et al.*	(BELLE Collab.)
ABE	02H	PRL 88 171801	K. Abe *et al.*	(BELLE Collab.)
ABE	02J	PRL 88 052002	K. Abe *et al.*	(BELLE Collab.)
ABE	02K	PRL 88 181803	K. Abe *et al.*	(BELLE Collab.)
ABE	02M	PRL 89 071801	K. Abe *et al.*	(BELLE Collab.)
ABE	02N	PL B538 11	K. Abe *et al.*	(BELLE Collab.)
ABE	02O	PR D65 091103R	K. Abe *et al.*	(BELLE Collab.)
ABE	02Q	PRL 89 122001	K. Abe *et al.*	(BELLE Collab.)
ABE	02U	PR D66 032007	K. Abe *et al.*	(BELLE Collab.)
ABE	02W	PRL 89 151802	K. Abe *et al.*	(BELLE Collab.)
ABE	02Z	PR D66 071102R	K. Abe *et al.*	(BELLE Collab.)
ACOSTA	02C	PR D65 092009	D. Acosta *et al.*	(CDF Collab.)
ACOSTA	02G	PR D66 112002	D. Acosta *et al.*	(CDF Collab.)
AFFOLDER	02B	PRL 88 071801	T. Affolder *et al.*	(CDF Collab.)
AHMED	02B	PR D66 031101R	S. Ahmed *et al.*	(CLEO Collab.)
ASNER	02	PR D65 031103R	D.M. Asner *et al.*	(CLEO Collab.)
AUBERT	02	PR D65 032001	B. Aubert *et al.*	(BaBar Collab.)
AUBERT	02C	PRL 88 101805	B. Aubert *et al.*	(BaBar Collab.)
AUBERT	02D	PR D65 051502R	B. Aubert *et al.*	(BaBar Collab.)
AUBERT	02E	PR D65 051101R	B. Aubert *et al.*	(BaBar Collab.)
AUBERT	02H	PRL 89 011802	B. Aubert *et al.*	(BaBar Collab.)
Also	02O	PRL 89 169903 (erratum)	B. Aubert *et al.*	(BaBar Collab.)
AUBERT	02I	PRL 88 221802	B. Aubert *et al.*	(BaBar Collab.)
AUBERT	02J	PRL 88 221803	B. Aubert *et al.*	(BaBar Collab.)
AUBERT	02K	PRL 88 231801	B. Aubert *et al.*	(BaBar Collab.)
AUBERT	02L	PRL 88 241801	B. Aubert *et al.*	(BaBar Collab.)
AUBERT	02M	PRL 89 061801	B. Aubert *et al.*	(BaBar Collab.)
AUBERT	02N	PR D66 032003	B. Aubert *et al.*	(BaBar Collab.)
AUBERT	02P	PRL 89 201802	B. Aubert *et al.*	(BaBar Collab.)
AUBERT	02Q	PRL 89 281802	B. Aubert *et al.*	(BaBar Collab.)
BRIERE	02	PRL 89 081803	R. Briere *et al.*	(CLEO Collab.)
CASEY	02	PR D66 092002	B.C.K. Casey *et al.*	(BELLE Collab.)
CHEN	02B	PL B546 196	K.-F. Chen *et al.*	(BELLE Collab.)
COAN	02	PRL 88 062001	T.E. Coan *et al.*	(CLEO Collab.)
Also	02B	PRL 88 069902 (erratum)	T.E. Coan *et al.*	(CLEO Collab.)
DRUTSKOY	02	PL B542 171	A. Drutskoy *et al.*	(BELLE Collab.)
DYTMAN	02	PR D66 091101R	S.A. Dytman *et al.*	(CLEO Collab.)
ECKHART	02	PRL 89 251801	E. Eckhart *et al.*	(CLEO Collab.)
EDWARDS	02	PR D65 012002	K.W. Edwards *et al.*	(CLEO Collab.)
GABYSHEV	02	PR D66 091102R	N. Gabyshev *et al.*	(BELLE Collab.)
GODANG	02	PRL 88 021802	R. Godang *et al.*	(CLEO Collab.)
GORDON	02	PL B542 183	A. Gordon *et al.*	(BELLE Collab.)
HARA	02	PRL 89 251803	K. Hara *et al.*	(BELLE Collab.)
KROKOVNY	02	PRL 89 231804	P. Korkovny *et al.*	(BELLE Collab.)
MAHAPATRA	02	PRL 88 101803	R. Mahapatra *et al.*	(CLEO Collab.)
NISHIDA	02	PRL 89 231801	S. Nishida *et al.*	(BELLE Collab.)
TOMURA	02	PL B542 207	T. Tomura *et al.*	(BELLE Collab.)
ABASHIAN	01	PRL 86 2509	A. Abashian *et al.*	(BELLE Collab.)
ABE	01D	PRL 86 3228	K. Abe *et al.*	(BELLE Collab.)
ABE	01G	PRL 87 091802	K. Abe *et al.*	(BELLE Collab.)
ABE	01H	PRL 87 101801	K. Abe *et al.*	(BELLE Collab.)
ABE	01I	PRL 87 111801	K. Abe *et al.*	(BELLE Collab.)

ABE	01K	PR D64 071101	K. Abe *et al.*	(BELLE Collab.)
ABE	01L	PRL 87 161601	K. Abe *et al.*	(BELLE Collab.)
ABE	01M	PL B517 309	K. Abe *et al.*	(BELLE Collab.)
ABREU	01H	PL B510 55	P. Abreu *et al.*	(DELPHI Collab.)
ALEXANDER	01B	PR D64 092001	J.P. Alexander *et al.*	(CLEO Collab.)
AMMAR	01B	PRL 87 271801	R. Ammar *et al.*	(CLEO Collab.)
ANDERSON	01	PRL 86 2732	S. Anderson *et al.*	(CLEO Collab.)
ANDERSON	01B	PRL 87 181803	S. Anderson *et al.*	(CLEO Collab.)
AUBERT	01	PRL 86 2515	B. Aubert *et al.*	(BaBar Collab.)
AUBERT	01B	PRL 87 091801	B. Aubert *et al.*	(BaBar Collab.)
AUBERT	01D	PRL 87 151801	B. Aubert *et al.*	(BaBar Collab.)
AUBERT	01E	PRL 87 151802	B. Aubert *et al.*	(BaBar Collab.)
AUBERT	01F	PRL 87 201803	B. Aubert *et al.*	(BaBar Collab.)
AUBERT	01G	PRL 87 221802	B. Aubert *et al.*	(BaBar Collab.)
AUBERT	01H	PRL 87 241801	B. Aubert *et al.*	(BaBar Collab.)
AUBERT	01I	PRL 87 241803	B. Aubert *et al.*	(BaBar Collab.)
BARATE	01D	EPJ C20 431	R. Barate *et al.*	(ALEPH Collab.)
BRIERE	01	PRL 86 3718	R.A. Biere *et al.*	(CLEO Collab.)
EDWARDS	01	PRL 86 30	K.W. Edwards *et al.*	(CLEO Collab.)
JAFFE	01	PRL 86 5000	D. Jaffe *et al.*	(CLEO Collab.)
RICHICHI	01	PR D63 031103R	S.J. Richichi *et al.*	(CLEO Collab.)
ABBIENDI	00Q	PL B482 15	G. Abbiendi *et al.*	(OPAL Collab.)
ABBIENDI,G	00B	PL B493 266	G. Abbiendi *et al.*	(OPAL Collab.)
ABE	00C	PR D62 071101R	K. Abe *et al.*	(SLD Collab.)
AFFOLDER	00C	PR D61 072005	T. Affolder *et al.*	(CDF Collab.)
AFFOLDER	00N	PRL 85 4668	T. Affolder *et al.*	(CDF Collab.)
AHMED	00B	PR D62 112003	S. Ahmed *et al.*	(CLEO Collab.)
ANASTASSOV	00	PRL 84 1393	A. Anastassov *et al.*	(CLEO Collab.)
ARTUSO	00	PRL 84 4292	M. Artuso *et al.*	(CLEO Collab.)
AVERY	00	PR D62 051101	P. Avery *et al.*	(CLEO Collab.)
BARATE	00Q	PL B492 259	R. Barate *et al.*	(ALEPH Collab.)
BARATE	00R	PL B492 275	R. Barate *et al.*	(ALEPH Collab.)
BEHRENS	00	PR D61 052001	B.H. Behrens *et al.*	(CLEO Collab.)
BEHRENS	00B	PL B490 36	B.H. Behrens *et al.*	(CLEO Collab.)
BERGFELD	00B	PR D62 091102R	T. Bergfeld *et al.*	(CLEO Collab.)
CHEN	00	PRL 85 525	S. Chen *et al.*	(CLEO Collab.)
COAN	00	PRL 84 5283	T.E. Coan *et al.*	(CLEO Collab.)
CRONIN-HEN...	00	PRL 85 515	D. Cronin-Hennessy *et al.*	(CLEO Collab.)
CSORNA	00	PR D61 111101	S.E. Csorna *et al.*	(CLEO Collab.)
JESSOP	00	PRL 85 2881	C.P. Jessop *et al.*	(CLEO Collab.)
LIPELES	00	PR D62 032005	E. Lipeles *et al.*	(CLEO Collab.)
RICHICHI	00	PRL 85 520	S.J. Richichi *et al.*	(CLEO Collab.)
ABBIENDI	99J	EPJ C12 609	G. Abbiendi *et al.*	(OPAL Collab.)
ABE	99K	PR D60 051101	F. Abe *et al.*	(CDF Collab.)
ABE	99Q	PR D60 072003	F. Abe *et al.*	(CDF Collab.)
AFFOLDER	99B	PRL 83 3378	T. Affolder *et al.*	(CDF Collab.)
AFFOLDER	99C	PR D60 112004	T. Affolder *et al.*	(CDF Collab.)
ARTUSO	99	PRL 82 3020	M. Artuso *et al.*	(CLEO Collab.)
BARTELT	99	PRL 82 3746	J. Bartelt *et al.*	(CLEO Collab.)
COAN	99	PR D59 111101	T.E. Coan *et al.*	(CLEO Collab.)
ABBOTT	98B	PL B423 419	B. Abbott *et al.*	(D0 Collab.)
ABE	98	PR D57 R3811	F. Abe *et al.*	(CDF Collab.)
ABE	98B	PR D57 5382	F. Abe *et al.*	(CDF Collab.)
ABE	98C	PRL 80 2057	F. Abe *et al.*	(CDF Collab.)
Also	99C	PR D59 032001	F. Abe *et al.*	(CDF Collab.)
ABE	98O	PR D58 072001	F. Abe *et al.*	(CDF Collab.)
ABE	98Q	PR D58 092002	F. Abe *et al.*	(CDF Collab.)
ABE	98U	PRL 81 5513	F. Abe *et al.*	(CDF Collab.)
ABE	98V	PRL 81 5742	F. Abe *et al.*	(CDF Collab.)
ACCIARRI	98D	EPJ C5 195	M. Acciarri *et al.*	(L3 Collab.)
ACCIARRI	98S	PL B438 417	M. Acciarri *et al.*	(L3 Collab.)
ACKERSTAFF	98Z	EPJ C5 379	K. Ackerstaff *et al.*	(OPAL Collab.)
BARATE	98Q	EPJ C4 387	R. Barate *et al.*	(ALEPH Collab.)
BEHRENS	98	PRL 80 3710	B.H. Behrens *et al.*	(CLEO Collab.)
BERGFELD	98	PRL 81 272	T. Bergfeld *et al.*	(CLEO Collab.)
BRANDENB...	98	PRL 80 2762	G. Brandenbrug *et al.*	(CLEO Collab.)
GODANG	98	PRL 80 3456	R. Godang *et al.*	(CLEO Collab.)
NEMATI	98	PR D57 5363	B. Nemati *et al.*	(CLEO Collab.)
ABE	97J	PRL 79 590	K. Abe *et al.*	(SLD Collab.)
ABREU	97F	ZPHY C74 19	P. Abreu *et al.*	(DELPHI Collab.)
Also	97K	ZPHY C75 579 erratum	P. Abreu *et al.*	(DELPHI Collab.)

ABREU	97N	ZPHY C76 579	P. Abreu *et al.*	(DELPHI Collab.)
ACCIARRI	97B	PL B391 474	M. Acciarri *et al.*	(L3 Collab.)
ACCIARRI	97C	PL B391 481	M. Acciarri *et al.*	(L3 Collab.)
ACKERSTAFF	97G	PL B395 128	K. Ackerstaff *et al.*	(OPAL Collab.)
ACKERSTAFF	97U	ZPHY C76 401	K. Ackerstaff *et al.*	(OPAL Collab.)
ACKERSTAFF	97V	ZPHY C76 417	K. Ackerstaff *et al.*	(OPAL Collab.)
ARTUSO	97	PL B399 321	M. Artuso *et al.*	(CLEO Collab.)
ASNER	97	PRL 79 799	D. Asner *et al.*	(CLEO Collab.)
ATHANAS	97	PRL 79 2208	M. Athanas *et al.*	(CLEO Collab.)
BUSKULIC	97	PL B395 373	D. Buskulic *et al.*	(ALEPH Collab.)
BUSKULIC	97D	ZPHY C75 397	D. Buskulic *et al.*	(ALEPH Collab.)
FU	97	PRL 79 3125	X. Fu *et al.*	(CLEO Collab.)
JESSOP	97	PRL 79 4533	C.P. Jessop *et al.*	(CLEO Collab.)
ABE	96B	PR D53 3496	F. Abe *et al.*	(CDF Collab.)
ABE	96C	PRL 76 4462	F. Abe *et al.*	(CDF Collab.)
ABE	96H	PRL 76 2015	F. Abe *et al.*	(CDF Collab.)
ABE	96L	PRL 76 4675	F. Abe *et al.*	(CDF Collab.)
ABE	96Q	PR D54 6596	F. Abe *et al.*	(CDF Collab.)
ABREU	96P	ZPHY C71 539	P. Abreu *et al.*	(DELPHI Collab.)
ABREU	96Q	ZPHY C72 17	P. Abreu *et al.*	(DELPHI Collab.)
ACCIARRI	96E	PL B383 487	M. Acciarri *et al.*	(L3 Collab.)
ADAM	96D	ZPHY C72 207	W. Adam *et al.*	(DELPHI Collab.)
ALBRECHT	96D	PL B374 256	H. Albrecht *et al.*	(ARGUS Collab.)
ALEXANDER	96T	PRL 77 5000	J.P. Alexander *et al.*	(CLEO Collab.)
ALEXANDER	96V	ZPHY C72 377	G. Alexander *et al.*	(OPAL Collab.)
ASNER	96	PR D53 1039	D.M. Asner *et al.*	(CLEO Collab.)
BARISH	96B	PRL 76 1570	B.C. Barish *et al.*	(CLEO Collab.)
BISHAI	96	PL B369 186	M. Bishai *et al.*	(CLEO Collab.)
BUSKULIC	96J	ZPHY C71 31	D. Buskulic *et al.*	(ALEPH Collab.)
BUSKULIC	96V	PL B384 471	D. Buskulic *et al.*	(ALEPH Collab.)
DUBOSCQ	96	PRL 76 3898	J.E. Duboscq *et al.*	(CLEO Collab.)
GIBAUT	96	PR D53 4734	D. Gibaut *et al.*	(CLEO Collab.)
PDG	96	PR D54 1	R. M. Barnett *et al.*	
ABE	95Z	PRL 75 3068	F. Abe *et al.*	(CDF Collab.)
ABREU	95N	PL B357 255	P. Abreu *et al.*	(DELPHI Collab.)
ABREU	95Q	ZPHY C68 13	P. Abreu *et al.*	(DELPHI Collab.)
ACCIARRI	95H	PL B363 127	M. Acciarri *et al.*	(L3 Collab.)
ACCIARRI	95I	PL B363 137	M. Acciarri *et al.*	(L3 Collab.)
ADAM	95	ZPHY C68 363	W. Adam *et al.*	(DELPHI Collab.)
AKERS	95J	ZPHY C66 555	R. Akers *et al.*	(OPAL Collab.)
AKERS	95T	ZPHY C67 379	R. Akers *et al.*	(OPAL Collab.)
ALEXANDER	95	PL B341 435	J. Alexander *et al.*	(CLEO Collab.)
Also	95C	PL B347 469 (erratum)	J. Alexander *et al.*	(CLEO Collab.)
BARISH	95	PR D51 1014	B.C. Barish *et al.*	(CLEO Collab.)
BUSKULIC	95N	PL B359 236	D. Buskulic *et al.*	(ALEPH Collab.)
ABE	94D	PRL 72 3456	F. Abe *et al.*	(CDF Collab.)
ABREU	94M	PL B338 409	P. Abreu *et al.*	(DELPHI Collab.)
AKERS	94C	PL B327 411	R. Akers *et al.*	(OPAL Collab.)
AKERS	94H	PL B336 585	R. Akers *et al.*	(OPAL Collab.)
AKERS	94J	PL B337 196	R. Akers *et al.*	(OPAL Collab.)
AKERS	94L	PL B337 393	R. Akers *et al.*	(OPAL Collab.)
ALAM	94	PR D50 43	M.S. Alam *et al.*	(CLEO Collab.)
ALBRECHT	94	PL B324 249	H. Albrecht *et al.*	(ARGUS Collab.)
ALBRECHT	94G	PL B340 217	H. Albrecht *et al.*	(ARGUS Collab.)
AMMAR	94	PR D49 5701	R. Ammar *et al.*	(CLEO Collab.)
ATHANAS	94	PRL 73 3503	M. Athanas *et al.*	(CLEO Collab.)
Also	95	PRL 74 3090 (erratum)	M. Athanas *et al.*	(CLEO Collab.)
BUSKULIC	94B	PL B322 441	D. Buskulic *et al.*	(ALEPH Collab.)
PDG	94	PR D50 1173	L. Montanet *et al.*	(CERN, LBL, BOST+)
PROCARIO	94	PRL 73 1472	M. Procario *et al.*	(CLEO Collab.)
STONE	94	HEPSY 93-11	S. Stone	
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ABREU	93D	ZPHY C57 181	P. Abreu *et al.*	(DELPHI Collab.)
ABREU	93G	PL B312 253	P. Abreu *et al.*	(DELPHI Collab.)
ACTON	93C	PL B307 247	P.D. Acton *et al.*	(OPAL Collab.)
ALBRECHT	93	ZPHY C57 533	H. Albrecht *et al.*	(ARGUS Collab.)
ALBRECHT	93E	ZPHY C60 11	H. Albrecht *et al.*	(ARGUS Collab.)
ALEXANDER	93B	PL B319 365	J. Alexander *et al.*	(CLEO Collab.)
AMMAR	93	PRL 71 674	R. Ammar *et al.*	(CLEO Collab.)
BARTELT	93	PRL 71 1680	J.E. Bartelt *et al.*	(CLEO Collab.)
BATTLE	93	PRL 71 3922	M. Battle *et al.*	(CLEO Collab.)

BEAN	93B	PRL 70 2681	A. Bean *et al.*	(CLEO Collab.)
BUSKULIC	93D	PL B307 194	D. Buskulic *et al.*	(ALEPH Collab.)
Also	94H	PL B325 537 (errata)	D. Buskulic *et al.*	(ALEPH Collab.)
BUSKULIC	93K	PL B313 498	D. Buskulic *et al.*	(ALEPH Collab.)
SANGHERA	93	PR D47 791	S. Sanghera *et al.*	(CLEO Collab.)
ALBRECHT	92C	PL B275 195	H. Albrecht *et al.*	(ARGUS Collab.)
ALBRECHT	92G	ZPHY C54 1	H. Albrecht *et al.*	(ARGUS Collab.)
ALBRECHT	92L	ZPHY C55 357	H. Albrecht *et al.*	(ARGUS Collab.)
BORTOLETTO	92	PR D45 21	D. Bortoletto *et al.*	(CLEO Collab.)
HENDERSON	92	PR D45 2212	S. Henderson *et al.*	(CLEO Collab.)
KRAMER	92	PL B279 181	G. Kramer, W.F. Palmer	(HAMB, OSU)
ALBAJAR	91C	PL B262 163	C. Albajar *et al.*	(UA1 Collab.)
ALBAJAR	91E	PL B273 540	C. Albajar *et al.*	(UA1 Collab.)
ALBRECHT	91B	PL B254 288	H. Albrecht *et al.*	(ARGUS Collab.)
ALBRECHT	91C	PL B255 297	H. Albrecht *et al.*	(ARGUS Collab.)
ALBRECHT	91E	PL B262 148	H. Albrecht *et al.*	(ARGUS Collab.)
BERKELMAN	91	ARNPS 41 1	K. Berkelman, S. Stone	(CORN, SYRA)
"Decays of B Mesons"				
FULTON	91	PR D43 651	R. Fulton *et al.*	(CLEO Collab.)
ALBRECHT	90B	PL B241 278	H. Albrecht *et al.*	(ARGUS Collab.)
ALBRECHT	90J	ZPHY C48 543	H. Albrecht *et al.*	(ARGUS Collab.)
ANTREASYAN	90B	ZPHY C48 553	D. Antreasyan *et al.*	(Crystal Ball Collab.)
BORTOLETTO	90	PRL 64 2117	D. Bortoletto *et al.*	(CLEO Collab.)
ELSEN	90	ZPHY C46 349	E. Elsen *et al.*	(JADE Collab.)
ROSNER	90	PR D42 3732	J.L. Rosner	
WAGNER	90	PRL 64 1095	S.R. Wagner *et al.*	(Mark II Collab.)
ALBRECHT	89C	PL B219 121	H. Albrecht *et al.*	(ARGUS Collab.)
ALBRECHT	89G	PL B229 304	H. Albrecht *et al.*	(ARGUS Collab.)
ALBRECHT	89J	PL B229 175	H. Albrecht *et al.*	(ARGUS Collab.)
ALBRECHT	89L	PL B232 554	H. Albrecht *et al.*	(ARGUS Collab.)
ARTUSO	89	PRL 62 2233	M. Artuso *et al.*	(CLEO Collab.)
AVERILL	89	PR D39 123	D.A. Averill *et al.*	(HRS Collab.)
AVERY	89B	PL B223 470	P. Avery *et al.*	(CLEO Collab.)
BEBEK	89	PRL 62 8	C. Bebek *et al.*	(CLEO Collab.)
BORTOLETTO	89	PRL 62 2436	D. Bortoletto *et al.*	(CLEO Collab.)
BORTOLETTO	89B	PRL 63 1667	D. Bortoletto *et al.*	(CLEO Collab.)
ALBRECHT	88F	PL B209 119	H. Albrecht *et al.*	(ARGUS Collab.)
ALBRECHT	88K	PL B215 424	H. Albrecht *et al.*	(ARGUS Collab.)
ALBRECHT	87C	PL B185 218	H. Albrecht *et al.*	(ARGUS Collab.)
ALBRECHT	87D	PL B199 451	H. Albrecht *et al.*	(ARGUS Collab.)
ALBRECHT	87I	PL B192 245	H. Albrecht *et al.*	(ARGUS Collab.)
ALBRECHT	87J	PL B197 452	H. Albrecht *et al.*	(ARGUS Collab.)
AVERY	87	PL B183 429	P. Avery *et al.*	(CLEO Collab.)
BEAN	87B	PRL 58 183	A. Bean *et al.*	(CLEO Collab.)
BEBEK	87	PR D36 1289	C. Bebek *et al.*	(CLEO Collab.)
ALAM	86	PR D34 3279	M.S. Alam *et al.*	(CLEO Collab.)
ALBRECHT	86F	PL B182 95	H. Albrecht *et al.*	(ARGUS Collab.)
PDG	86	PL 170B	M. Aguilar-Benitez *et al.*	(CERN, CIT+)
CHEN	85	PR D31 2386	A. Chen *et al.*	(CLEO Collab.)
HAAS	85	PRL 55 1248	J. Haas *et al.*	(CLEO Collab.)
AVERY	84	PRL 53 1309	P. Avery *et al.*	(CLEO Collab.)
GILES	84	PR D30 2279	R. Giles *et al.*	(CLEO Collab.)
BEHRENDS	83	PRL 50 881	S. Behrends *et al.*	(CLEO Collab.)