$\psi(2S)$

$$I^G(J^{PC}) = 0^-(1^{--})$$

See the Review on "$\psi(2S)$ and χ_c branching ratios" before the $\chi_{c0}(1P)$ Listings.

$\psi(2S)$ MASS

OUR FIT includes measurements of $m_{\psi(2S)}$, $m_{\psi(3770)}$, and $m_{\psi(3770)} - m_{\psi(2S)}$.

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
3686.10 ±0.06 OUR FIT Error includes scale factor of 5.9.				
3686.097±0.010 OUR AVERAGE				
3686.099±0.004±0.009		[1] ANASHIN 15	KEDR	$e^+e^- \to$ hadrons
3686.12 ±0.06 ±0.10	4k	AAIJ 12H	LHCB	$pp \to J/\psi\pi^+\pi^- X$
3685.95 ±0.10	413	[2] ARTAMONOV 00	OLYA	$e^+e^- \to$ hadrons
3685.98 ±0.09 ±0.04		[3] ARMSTRONG 93B	E760	$\overline{p}p \to e^+e^-$

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

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
$3686.114\pm0.007^{+0.011}_{-0.016}$		[4] ANASHIN 12	KEDR	$e^+e^- \to$ hadrons
3686.111±0.025±0.009		AULCHENKO 03	KEDR	$e^+e^- \to$ hadrons
3686.00 ±0.10	413	[5] ZHOLENTZ 80	OLYA	e^+e^-

[1] Supersedes AULCHENKO 03 and ANASHIN 12.

[2] Reanalysis of ZHOLENTZ 80 using new electron mass (COHEN 87) and radiative corrections (KURAEV 85).

[3] Mass central value and systematic error recalculated by us according to Eq. (16) in ARMSTRONG 93B, using the value for the $J/\psi(1S)$ mass from AULCHENKO 03.

[4] From the scans in 2004 and 2006. ANASHIN 12 reports the value $3686.114 \pm 0.007 \pm 0.011^{+0.002}_{-0.012}$ MeV, where the third uncertainty is due to assumptions on the interference between the resonance and hadronic continuum. We combined the two systematic uncertainties.

[5] Superseded by ARTAMONOV 00.

$m_{\psi(2S)} - m_{J/\psi(1S)}$

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
589.188±0.028 OUR AVERAGE			
589.194±0.027±0.011	[1] AULCHENKO 03	KEDR	$e^+e^- \to$ hadrons
589.7 ±1.2	LEMOIGNE 82	GOLI	185 π^- Be $\to \gamma\mu^+\mu^-$ A
589.07 ±0.13	[1] ZHOLENTZ 80	OLYA	e^+e^-
588.7 ±0.8	LUTH 75	MRK1	

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

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
588 ±1	[2] BAI 98E	BES	e^+e^-

[1] Redundant with data in mass above.
[2] Systematic errors not evaluated.

$\psi(2S)$ WIDTH

VALUE (keV)	EVTS	DOCUMENT ID	TECN	COMMENT
294± 8 OUR FIT				
286±16 OUR AVERAGE				
358±88± 4		ABLIKIM 08B	BES2	$e^+e^- \to$ hadrons
290±25± 4	2.7k	ANDREOTTI 07	E835	$p\overline{p} \to e^+e^-$, $J/\psi X$
331±58± 2		ABLIKIM 06L	BES2	$e^+e^- \to$ hadrons
264±27		[1] BAI 02B	BES2	e^+e^-
287±37±16		[2] ARMSTRONG 93B	E760	$\overline{p}p \to e^+e^-$

[1] From a simultaneous fit to the hadronic and $\mu^+\mu^-$ cross section, assuming $\Gamma = \Gamma_h + \Gamma_e + \Gamma_\mu + \Gamma_\tau$ and lepton universality. Does not include vacuum polarization correction.

[2] The initial-state radiation correction reevaluated by ANDREOTTI 07 in its Ref. [4].

$\psi(2S)$ DECAY MODES

	Mode	Fraction (Γ_i/Γ)	Scale factor/ Confidence level
Γ_1	hadrons	(97.85 ±0.13) %	
Γ_2	virtual$\gamma \to$ hadrons	(1.73 ±0.14) %	S=1.5
Γ_3	ggg	(10.6 ±1.6) %	
Γ_4	γgg	(1.03 ±0.29) %	
Γ_5	light hadrons	(15.4 ±1.5) %	
Γ_6	K_S^0 anything	(16.0 ±1.1) %	
Γ_7	e^+e^-	(7.93 ±0.17) × 10^{-3}	
Γ_8	$\mu^+\mu^-$	(8.0 ±0.6) × 10^{-3}	
Γ_9	$\tau^+\tau^-$	(3.1 ±0.4) × 10^{-3}	

Decays into $J/\psi(1S)$ and anything

	Mode	Fraction (Γ_i/Γ)	
Γ_{10}	$J/\psi(1S)$ anything	(61.4 ±0.6) %	
Γ_{11}	$J/\psi(1S)$ neutrals	(25.38 ±0.32) %	
Γ_{12}	$J/\psi(1S)\pi^+\pi^-$	(34.68 ±0.30) %	
Γ_{13}	$J/\psi(1S)\pi^0\pi^0$	(18.24 ±0.31) %	
Γ_{14}	$J/\psi(1S)\eta$	(3.37 ±0.05) %	
Γ_{15}	$J/\psi(1S)\pi^0$	(1.268±0.032) × 10^{-3}	

Hadronic decays

	Mode	Fraction (Γ_i/Γ)	Scale factor
Γ_{16}	$\pi^+\pi^-$	(7.8 ±2.6) × 10^{-6}	
Γ_{17}	$\pi^+\pi^-\pi^0$	(2.01 ±0.17) × 10^{-4}	S=1.7
Γ_{18}	$\rho(770)\pi \to \pi^+\pi^-\pi^0$	(3.2 ±1.2) × 10^{-5}	S=1.8
Γ_{19}	$\rho(2150)\pi \to \pi^+\pi^-\pi^0$	(1.9 $^{+1.2}_{-0.4}$) × 10^{-4}	
Γ_{20}	$2(\pi^+\pi^-)$	(2.4 ±0.6) × 10^{-4}	S=2.2
Γ_{21}	$\rho^0\pi^+\pi^-$	(2.2 ±0.6) × 10^{-4}	S=1.4
Γ_{22}	$2(\pi^+\pi^-)\pi^0$	(2.9 ±1.0) × 10^{-3}	S=4.7
Γ_{23}	$\rho a_2(1320)$	(2.6 ±0.9) × 10^{-4}	
Γ_{24}	$\pi^+\pi^-\pi^0\pi^0\pi^0$	(5.3 ±0.9) × 10^{-3}	

Γ_{25}	$\pi^+\pi^-4\pi^0$		$(\ 1.4\ \pm1.0\ )\times10^{-3}$		
Γ_{26}	$\rho^\pm\pi^\mp\pi^0\pi^0$	$<$	$2.7\qquad\qquad\times10^{-3}$	CL=90%	
Γ_{27}	$3(\pi^+\pi^-)$		$(\ 3.5\ \pm2.0\ )\times10^{-4}$	S=2.8	
Γ_{28}	$2(\pi^+\pi^-\pi^0)$		$(\ 4.8\ \pm1.5\ )\times10^{-3}$		
Γ_{29}	$3(\pi^+\pi^-)\pi^0$		$(\ 3.5\ \pm1.6\ )\times10^{-3}$		
Γ_{30}	$2(\pi^+\pi^-)3\pi^0$		$(\ 1.42\ \pm0.31\ )\ \%$		
Γ_{31}	$\eta\pi^+\pi^-$	$<$	$1.6\qquad\qquad\times10^{-4}$	CL=90%	
Γ_{32}	$\eta\pi^+\pi^-\pi^0$		$(\ 9.5\ \pm1.7\ )\times10^{-4}$		
Γ_{33}	$\eta\,2(\pi^+\pi^-)$		$(\ 1.2\ \pm0.6\ )\times10^{-3}$		
Γ_{34}	$\eta\pi^+\pi^-\pi^0\pi^0$	$<$	$4\qquad\qquad\times10^{-4}$	CL=90%	
Γ_{35}	$\eta\pi^+\pi^-3\pi^0$	$<$	$2.1\qquad\qquad\times10^{-3}$	CL=90%	
Γ_{36}	$\eta\,2(\pi^+\pi^-\pi^0)$	$<$	$2.1\qquad\qquad\times10^{-3}$	CL=90%	
Γ_{37}	$\rho\eta$		$(\ 2.2\ \pm0.6\ )\times10^{-5}$	S=1.1	
Γ_{38}	$\eta'\pi^+\pi^-\pi^0$		$(\ 4.5\ \pm2.1\ )\times10^{-4}$		
Γ_{39}	$\eta'\rho$		$(\ 1.9\ ^{+1.7}_{-1.2}\ )\times10^{-5}$		
Γ_{40}	$\omega\pi^0$		$(\ 2.1\ \pm0.6\ )\times10^{-5}$		
Γ_{41}	$\omega\pi^+\pi^-$		$(\ 7.3\ \pm1.2\ )\times10^{-4}$	S=2.1	
Γ_{42}	$\omega\pi^+\pi^-2\pi^0$		$(\ 8.7\ \pm2.4\ )\times10^{-3}$		
Γ_{43}	$b_1^\pm\pi^\mp$		$(\ 4.0\ \pm0.6\ )\times10^{-4}$	S=1.1	
Γ_{44}	$\omega f_2(1270)$		$(\ 2.2\ \pm0.4\ )\times10^{-4}$		
Γ_{45}	$\omega\pi^0\pi^0$		$(\ 1.11\ \pm0.35\ )\times10^{-3}$		
Γ_{46}	$\omega\,3\pi^0$	$<$	$8\qquad\qquad\times10^{-4}$	CL=90%	
Γ_{47}	$b_1^0\pi^0$		$(\ 2.4\ \pm0.6\ )\times10^{-4}$		
Γ_{48}	$\omega\eta$	$<$	$1.1\qquad\qquad\times10^{-5}$	CL=90%	
Γ_{49}	$\omega\eta'$		$(\ 3.2\ ^{+2.5}_{-2.1}\ )\times10^{-5}$		
Γ_{50}	$\phi\pi^0$	$<$	$4\qquad\qquad\times10^{-7}$	CL=90%	
Γ_{51}	$\phi\pi^+\pi^-$		$(\ 1.18\ \pm0.26\ )\times10^{-4}$	S=1.5	
Γ_{52}	$\phi f_0(980)\to\ \pi^+\pi^-$		$(\ 7.5\ \pm3.3\ )\times10^{-5}$	S=1.6	
Γ_{53}	$\phi\eta$		$(\ 3.10\ \pm0.31\ )\times10^{-5}$		
Γ_{54}	$\eta\phi(2170),\ \ \phi(2170)\to$ $\phi f_0(980),\ \ f_0\to\ \pi^+\pi^-$	$<$	$2.2\qquad\qquad\times10^{-6}$	CL=90%	
Γ_{55}	$\phi\eta'$		$(\ 1.54\ \pm0.20\ )\times10^{-5}$		
Γ_{56}	$\phi f_1(1285)$		$(\ 3.0\ \pm1.3\ )\times10^{-5}$		
Γ_{57}	$\phi\eta(1405)\to\ \phi\pi^+\pi^-\eta$		$(\ 8.5\ \pm1.7\ )\times10^{-6}$		
Γ_{58}	$\phi f_2'(1525)$		$(\ 4.4\ \pm1.6\ )\times10^{-5}$		
Γ_{59}	K^+K^-		$(\ 7.5\ \pm0.5\ )\times10^{-5}$		
Γ_{60}	$K^+K^-\pi^+$		$(\ 7.3\ \pm0.5\ )\times10^{-4}$		
Γ_{61}	$K^+K^-\pi^0$		$(\ 4.07\ \pm0.31\ )\times10^{-5}$		
Γ_{62}	$K_S^0 K_S^0$	$<$	$4.6\qquad\qquad\times10^{-6}$		
Γ_{63}	$K_S^0 K_L^0$		$(\ 5.34\ \pm0.33\ )\times10^{-5}$		
Γ_{64}	$K_S^0 K_L^0\pi^0$	$<$	$3.0\qquad\qquad\times10^{-4}$	CL=90%	
Γ_{65}	$K^+K^-\pi^0\pi^0$		$(\ 2.6\ \pm1.3\ )\times10^{-4}$		

Γ_{66}	$K^+ K^- \pi^+ \pi^- \pi^0$	$(1.26 \pm 0.09) \times 10^{-3}$	
Γ_{67}	$\omega f_0(1710) \to \omega K^+ K^-$	$(5.9 \pm 2.2) \times 10^{-5}$	
Γ_{68}	$K^*(892)^0 K^- \pi^+ \pi^0 +$ c.c.	$(8.6 \pm 2.2) \times 10^{-4}$	
Γ_{69}	$K^*(892)^+ K^- \pi^+ \pi^- +$ c.c.	$(9.6 \pm 2.8) \times 10^{-4}$	
Γ_{70}	$K^*(892)^+ K^- \rho^0 +$ c.c.	$(7.3 \pm 2.6) \times 10^{-4}$	
Γ_{71}	$K^*(892)^0 K^- \rho^+ +$ c.c.	$(6.1 \pm 1.8) \times 10^{-4}$	
Γ_{72}	$K^0_S K^0_S \pi^+ \pi^-$	$(2.2 \pm 0.4) \times 10^{-4}$	
Γ_{73}	$K^0_S K^0_L \pi^0 \pi^0$	$(1.3 \pm 0.6) \times 10^{-3}$	
Γ_{74}	$K^0_S K^0_L \eta$	$(1.3 \pm 0.5) \times 10^{-3}$	
Γ_{75}	$K^+ K^- \rho^0$	$(2.2 \pm 0.4) \times 10^{-4}$	
Γ_{76}	$K^*(892)^0 \overline{K}^*_2(1430)^0$	$(1.9 \pm 0.5) \times 10^{-4}$	
Γ_{77}	$K^+ K^- \pi^+ \pi^- \eta$	$(1.3 \pm 0.7) \times 10^{-3}$	
Γ_{78}	$K^+ K^- 2(\pi^+ \pi^-)$	$(1.9 \pm 0.9) \times 10^{-3}$	
Γ_{79}	$K^+ K^- 2(\pi^+ \pi^-) \pi^0$	$(1.00 \pm 0.31) \times 10^{-3}$	
Γ_{80}	$K^+ K^*(892)^- +$ c.c.	$(2.9 \pm 0.4) \times 10^{-5}$	S=1.2
Γ_{81}	$2(K^+ K^-)$	$(6.3 \pm 1.3) \times 10^{-5}$	
Γ_{82}	$2(K^+ K^-) \pi^0$	$(1.10 \pm 0.28) \times 10^{-4}$	
Γ_{83}	$K^+ K^- \phi$	$(7.0 \pm 1.6) \times 10^{-5}$	
Γ_{84}	$K_1(1270)^\pm K^\mp$	$(1.00 \pm 0.28) \times 10^{-3}$	
Γ_{85}	$K^+ \overline{K}^*(892)^0 \pi^- +$ c.c.	$(6.7 \pm 2.5) \times 10^{-4}$	
Γ_{86}	$\eta K^+ K^-$, no $\eta \phi$	$(3.49 \pm 0.17) \times 10^{-5}$	
Γ_{87}	$X(1750)\eta \to K^+ K^- \eta$	$(4.8 \pm 2.8) \times 10^{-6}$	
Γ_{88}	$K_1(1400)^\pm K^\mp$	$< 3.1 \times 10^{-4}$	CL=90%
Γ_{89}	$K^*_2(1430)^\pm K^\mp$	$(7.1 {}^{+1.3}_{-0.9}) \times 10^{-5}$	
Γ_{90}	$K^*(892)^0 \overline{K}^0 +$ c.c.	$(1.09 \pm 0.20) \times 10^{-4}$	
Γ_{91}	$\omega K^+ K^-$	$(1.62 \pm 0.11) \times 10^{-4}$	S=1.1
Γ_{92}	$\omega K^0_S K^0_S$	$(7.0 \pm 0.5) \times 10^{-5}$	
Γ_{93}	$\omega K^*(892)^+ K^- +$ c.c.	$(2.07 \pm 0.26) \times 10^{-4}$	
Γ_{94}	$\omega K^*_2(1430)^+ K^- +$ c.c.	$(6.1 \pm 1.2) \times 10^{-5}$	
Γ_{95}	$\omega \overline{K}^*(892)^0 K^0$	$(1.68 \pm 0.30) \times 10^{-4}$	
Γ_{96}	$\omega \overline{K}^*_2(1430)^0 K^0$	$(5.8 \pm 2.2) \times 10^{-5}$	
Γ_{97}	$\omega X(1440) \to \omega K^0_S K^- \pi^+ +$ c.c.	$(1.6 \pm 0.4) \times 10^{-5}$	
Γ_{98}	$\omega X(1440) \to \omega K^+ K^- \pi^0$	$(1.09 \pm 0.26) \times 10^{-5}$	
Γ_{99}	$\omega f_1(1285) \to \omega K^0_S K^- \pi^+ +$ c.c.	$(3.0 \pm 1.0) \times 10^{-6}$	
Γ_{100}	$\omega f_1(1285) \to \omega K^+ K^- \pi^0$	$(1.2 \pm 0.7) \times 10^{-6}$	
Γ_{101}	$p \overline{p}$	$(2.94 \pm 0.08) \times 10^{-4}$	
Γ_{102}	$n \overline{n}$	$(3.06 \pm 0.15) \times 10^{-4}$	
Γ_{103}	$p \overline{p} \pi^0$	$(1.53 \pm 0.07) \times 10^{-4}$	
Γ_{104}	$N(940)\overline{p} +$ c.c. $\to p \overline{p} \pi^0$	$(6.4 {}^{+1.8}_{-1.3}) \times 10^{-5}$	
Γ_{105}	$N(1440)\overline{p} +$ c.c. $\to p \overline{p} \pi^0$	$(7.3 {}^{+1.7}_{-1.5}) \times 10^{-5}$	S=2.5

Γ_{106}	$N(1520)\overline{p}+$ c.c. $\rightarrow$ $p\overline{p}\pi^0$	(6.4	$^{+2.3}_{-1.8}$	) $\times 10^{-6}$	
Γ_{107}	$N(1535)\overline{p}+$ c.c. $\rightarrow$ $p\overline{p}\pi^0$	(2.5	± 1.0	) $\times 10^{-5}$	
Γ_{108}	$N(1650)\overline{p}+$ c.c. $\rightarrow$ $p\overline{p}\pi^0$	(3.8	$^{+1.4}_{-1.7}$	) $\times 10^{-5}$	
Γ_{109}	$N(1720)\overline{p}+$ c.c. $\rightarrow$ $p\overline{p}\pi^0$	(1.79	$^{+0.26}_{-0.70}$	) $\times 10^{-5}$	
Γ_{110}	$N(2300)\overline{p}+$ c.c. $\rightarrow$ $p\overline{p}\pi^0$	(2.6	$^{+1.2}_{-0.7}$	) $\times 10^{-5}$	
Γ_{111}	$N(2570)\overline{p}+$ c.c. $\rightarrow$ $p\overline{p}\pi^0$	(2.13	$^{+0.40}_{-0.31}$	) $\times 10^{-5}$	
Γ_{112}	$p\overline{p}\pi^+\pi^-$	(6.0	± 0.4	) $\times 10^{-4}$	
Γ_{113}	$p\overline{p}K^+K^-$	(2.7	± 0.7	) $\times 10^{-5}$	
Γ_{114}	$p\overline{p}\eta$	(6.0	± 0.4	) $\times 10^{-5}$	
Γ_{115}	$N(1535)\overline{p}+$ c.c. $\rightarrow$ $p\overline{p}\eta$	(4.5	$^{+0.7}_{-0.6}$	) $\times 10^{-5}$	
Γ_{116}	$p\overline{p}\pi^+\pi^-\pi^0$	(7.3	± 0.7	) $\times 10^{-4}$	
Γ_{117}	$p\overline{p}\rho^0$	(5.0	± 2.2	) $\times 10^{-5}$	
Γ_{118}	$p\overline{p}\omega$	(6.9	± 2.1	) $\times 10^{-5}$	
Γ_{119}	$p\overline{p}\eta'$	(1.10	± 0.13	) $\times 10^{-5}$	
Γ_{120}	$p\overline{p}\phi$	(6.1	± 0.6	) $\times 10^{-6}$	
Γ_{121}	$\phi X(1835) \rightarrow$ $p\overline{p}\phi$	< 1.82		$\times 10^{-7}$	CL=90%
Γ_{122}	$p\overline{n}\pi^-$ or c.c.	(2.48	± 0.17	) $\times 10^{-4}$	
Γ_{123}	$p\overline{n}\pi^-\pi^0$	(3.2	± 0.7	) $\times 10^{-4}$	
Γ_{124}	$\Lambda\overline{\Lambda}$	(3.81	± 0.13	) $\times 10^{-4}$	S=1.4
Γ_{125}	$\Lambda\overline{\Lambda}\pi^0$	< 2.9		$\times 10^{-6}$	CL=90%
Γ_{126}	$\Lambda\overline{\Lambda}\eta$	(2.5	± 0.4	) $\times 10^{-5}$	
Γ_{127}	$\Lambda\overline{\Lambda}\pi^+\pi^-$	(2.8	± 0.6	) $\times 10^{-4}$	
Γ_{128}	$\Lambda\overline{p}K^+$	(1.00	± 0.14	) $\times 10^{-4}$	
Γ_{129}	$\Lambda\overline{p}K^*(892)^+ +$ c.c.	(6.3	± 0.7	) $\times 10^{-5}$	
Γ_{130}	$\Lambda\overline{p}K^+\pi^+\pi^-$	(1.8	± 0.4	) $\times 10^{-4}$	
Γ_{131}	$\overline{\Lambda}nK^0_S+$ c.c.	(8.1	± 1.8	) $\times 10^{-5}$	
Γ_{132}	$\Delta^{++}\overline{\Delta}^{--}$	(1.28	± 0.35	) $\times 10^{-4}$	
Γ_{133}	$\Lambda\overline{\Sigma}^+\pi^- +$ c.c.	(1.40	± 0.13	) $\times 10^{-4}$	
Γ_{134}	$\Lambda\overline{\Sigma}^-\pi^+ +$ c.c.	(1.54	± 0.14	) $\times 10^{-4}$	
Γ_{135}	$\Lambda\overline{\Sigma}^0 +$ c.c.	(1.6	± 0.7	) $\times 10^{-6}$	
Γ_{136}	$\Lambda\overline{\Sigma}^0$				
Γ_{137}	$\Sigma^0\overline{p}K^+ +$ c.c.	(1.67	± 0.18	) $\times 10^{-5}$	
Γ_{138}	$\Sigma^+\overline{\Sigma}^-$	(2.43	± 0.10	) $\times 10^{-4}$	S=1.4
Γ_{139}	$\Sigma^0\overline{\Sigma}^0$	(2.35	± 0.09	) $\times 10^{-4}$	S=1.1
Γ_{140}	$\Sigma(1385)^+\overline{\Sigma}(1385)^-$	(8.5	± 0.7	) $\times 10^{-5}$	
Γ_{141}	$\Sigma(1385)^-\overline{\Sigma}(1385)^+$	(8.5	± 0.8	) $\times 10^{-5}$	
Γ_{142}	$\Sigma(1385)^0\overline{\Sigma}(1385)^0$	(6.9	± 0.7	) $\times 10^{-5}$	
Γ_{143}	$\Xi^-\overline{\Xi}^+$	(2.87	± 0.11	) $\times 10^{-4}$	S=1.1
Γ_{144}	$\Xi^0\overline{\Xi}^0$	(2.3	± 0.4	) $\times 10^{-4}$	S=4.2
Γ_{145}	$\Xi(1530)^0\overline{\Xi}(1530)^0$	(6.8	± 0.4	) $\times 10^{-5}$	
Γ_{146}	$\Lambda\overline{\Xi}^+K^- +$ c.c.	(3.9	± 0.4	) $\times 10^{-5}$	

Γ_{147}	$\Xi(1530)^-\overline{\Xi}(1530)^+$	$(\ 1.15\ \pm0.07\ )\times10^{-4}$		
Γ_{148}	$\Xi(1530)^-\overline{\Xi}^+$	$(\ 7.0\ \ \pm1.2\ \ )\times10^{-6}$		
Γ_{149}	$\Xi(1530)^0\overline{\Xi}^0$	$(\ 5.3\ \ \pm0.5\ \ )\times10^{-6}$		
Γ_{150}	$\Xi(1690)^-\overline{\Xi}^+ \to\ K^-\Lambda\overline{\Xi}^+ +$ c.c.	$(\ 5.2\ \ \pm1.6\ \ )\times10^{-6}$		
Γ_{151}	$\Xi(1820)^-\overline{\Xi}^+ \to\ K^-\Lambda\overline{\Xi}^+ +$ c.c.	$(\ 1.20\ \pm0.32\ )\times10^{-5}$		
Γ_{152}	$\Sigma^0\overline{\Xi}^+K^- +$ c.c.	$(\ 3.7\ \ \pm0.4\ \ )\times10^{-5}$		
Γ_{153}	$\Omega^-\overline{\Omega}^+$	$(\ 5.66\ \pm0.30\ )\times10^{-5}$		S=1.3
Γ_{154}	$\eta_c\pi^+\pi^-\pi^0$	$<\ \ 1.0\ \ \ \ \ \ \ \ \ \ \times10^{-3}$		CL=90%
Γ_{155}	$h_c(1P)\pi^0$	$(\ 8.6\ \ \pm1.3\ \ )\times10^{-4}$		
Γ_{156}	$\Lambda_c^+\overline{p}e^+e^- +$ c.c.	$<\ \ 1.7\ \ \ \ \ \ \ \ \ \ \times10^{-6}$		CL=90%
Γ_{157}	$\Theta(1540)\overline{\Theta}(1540) \to$ $K_S^0 p K^-\overline{n} +$ c.c.	[a] $<\ \ 8.8\ \ \ \ \ \ \ \ \ \ \times10^{-6}$		CL=90%
Γ_{158}	$\Theta(1540)K^-\overline{n} \to\ K_S^0 p K^-\overline{n}$	[a] $<\ \ 1.0\ \ \ \ \ \ \ \ \ \ \times10^{-5}$		CL=90%
Γ_{159}	$\Theta(1540)K_S^0\overline{p} \to\ K_S^0\overline{p}K^+ n$	[a] $<\ \ 7.0\ \ \ \ \ \ \ \ \ \ \times10^{-6}$		CL=90%
Γ_{160}	$\overline{\Theta}(1540)K^+ n \to\ K_S^0\overline{p}K^+ n$	[a] $<\ \ 2.6\ \ \ \ \ \ \ \ \ \ \times10^{-5}$		CL=90%
Γ_{161}	$\overline{\Theta}(1540)K_S^0 p \to\ K_S^0 p K^-\overline{n}$	[a] $<\ \ 6.0\ \ \ \ \ \ \ \ \ \ \times10^{-6}$		CL=90%

Radiative decays

Γ_{162}	$\gamma\chi_{c0}(1P)$	$(\ 9.79\ \pm0.20\ )\ \%$		
Γ_{163}	$\gamma\chi_{c1}(1P)$	$(\ 9.75\ \pm0.24\ )\ \%$		
Γ_{164}	$\gamma\chi_{c2}(1P)$	$(\ 9.52\ \pm0.20\ )\ \%$		
Γ_{165}	$\gamma\eta_c(1S)$	$(\ 3.4\ \ \pm0.5\ \ )\times10^{-3}$		S=1.3
Γ_{166}	$\gamma\eta_c(2S)$	$(\ 7\ \ \ \ \ \pm5\ \ \ \ )\times10^{-4}$		
Γ_{167}	$\gamma\pi^0$	$(\ 1.04\ \pm0.22\ )\times10^{-6}$		S=1.4
Γ_{168}	$\gamma2(\pi^+\pi^-)$	$(\ 4.0\ \ \pm0.6\ \ )\times10^{-4}$		
Γ_{169}	$\gamma3(\pi^+\pi^-)$	$<\ \ 1.7\ \ \ \ \ \ \ \ \ \ \times10^{-4}$		CL=90%
Γ_{170}	$\gamma\eta'(958)$	$(\ 1.24\ \pm0.04\ )\times10^{-4}$		
Γ_{171}	$\gamma f_2(1270)$	$(\ 2.73\ ^{+0.29}_{-0.25}\ )\times10^{-4}$		S=1.8
Γ_{172}	$\gamma f_0(1370) \to\ \gamma K\overline{K}$	$(\ 3.1\ \ \pm1.7\ \ )\times10^{-5}$		
Γ_{173}	$\gamma f_0(1500)$	$(\ 9.3\ \ \pm1.9\ \ )\times10^{-5}$		
Γ_{174}	$\gamma f_2'(1525)$	$(\ 3.3\ \ \pm0.8\ \ )\times10^{-5}$		
Γ_{175}	$\gamma f_0(1710)$			
Γ_{176}	$\gamma f_0(1710) \to\ \gamma\pi\pi$	$(\ 3.5\ \ \pm0.6\ \ )\times10^{-5}$		
Γ_{177}	$\gamma f_0(1710) \to\ \gamma K\overline{K}$	$(\ 6.6\ \ \pm0.7\ \ )\times10^{-5}$		
Γ_{178}	$\gamma f_0(2100) \to\ \gamma\pi\pi$	$(\ 4.8\ \ \pm1.0\ \ )\times10^{-6}$		
Γ_{179}	$\gamma f_0(2200) \to\ \gamma K\overline{K}$	$(\ 3.2\ \ \pm1.0\ \ )\times10^{-6}$		
Γ_{180}	$\gamma f_J(2220) \to\ \gamma\pi\pi$	$<\ \ 5.8\ \ \ \ \ \ \ \ \ \ \times10^{-6}$		CL=90%
Γ_{181}	$\gamma f_J(2220) \to\ \gamma K\overline{K}$	$<\ \ 9.5\ \ \ \ \ \ \ \ \ \ \times10^{-6}$		CL=90%
Γ_{182}	$\gamma\eta$	$(\ 9.2\ \ \pm1.8\ \ )\times10^{-7}$		
Γ_{183}	$\gamma\eta\pi^+\pi^-$	$(\ 8.7\ \ \pm2.1\ \ )\times10^{-4}$		
Γ_{184}	$\gamma\eta(1405)$			
Γ_{185}	$\gamma\eta(1405) \to\ \gamma K\overline{K}\pi$	$<\ \ 9\ \ \ \ \ \ \ \ \ \ \ \ \times10^{-5}$		CL=90%

Γ_{186}	$\gamma\eta(1405) \to \gamma\eta\pi^+\pi^-$	$(\ 3.6\ \ \pm2.5\ \ ) \times 10^{-5}$	
Γ_{187}	$\gamma\eta(1405) \to \gamma f_0(980)\pi^0 \to$	$<\ \ 5.0 \qquad \times 10^{-7}$	CL=90%
	$\gamma\pi^+\pi^-\pi^0$		
Γ_{188}	$\gamma\eta(1475)$		
Γ_{189}	$\gamma\eta(1475) \to \gamma K\overline{K}\pi$	$<\ \ 1.4 \qquad \times 10^{-4}$	CL=90%
Γ_{190}	$\gamma\eta(1475) \to \gamma\eta\pi^+\pi^-$	$<\ \ 8.8 \qquad \times 10^{-5}$	CL=90%
Γ_{191}	$\gamma K^{*0}K^+\pi^- +$ c.c.	$(\ 3.7\ \ \pm0.9\ \ ) \times 10^{-4}$	
Γ_{192}	$\gamma K^{*0}\overline{K}^{*0}$	$(\ 2.4\ \ \pm0.7\ \ ) \times 10^{-4}$	
Γ_{193}	$\gamma K_S^0 K^+\pi^- +$ c.c.	$(\ 2.6\ \ \pm0.5\ \ ) \times 10^{-4}$	
Γ_{194}	$\gamma K^+K^-\pi^+\pi^-$	$(\ 1.9\ \ \pm0.5\ \ ) \times 10^{-4}$	
Γ_{195}	$\gamma K^+K^- 2(\pi^+\pi^-)$	$<\ \ 2.2 \qquad \times 10^{-4}$	CL=90%
Γ_{196}	$\gamma 2(K^+K^-)$	$<\ \ 4 \qquad \times 10^{-5}$	CL=90%
Γ_{197}	$\gamma p\overline{p}$	$(\ 3.9\ \ \pm0.5\ \ ) \times 10^{-5}$	S=2.0
Γ_{198}	$\gamma f_2(1950) \to \gamma p\overline{p}$	$(\ 1.20\ \ \pm0.22\ ) \times 10^{-5}$	
Γ_{199}	$\gamma f_2(2150) \to \gamma p\overline{p}$	$(\ 7.2\ \ \pm1.8\ \ ) \times 10^{-6}$	
Γ_{200}	$\gamma X(1835) \to \gamma p\overline{p}$	$(\ 4.6\ \ ^{+1.8}_{-4.0}\ ) \times 10^{-6}$	
Γ_{201}	$\gamma X \to \gamma p\overline{p}$	$[b] <\ \ 2 \qquad \times 10^{-6}$	CL=90%
Γ_{202}	$\gamma p\overline{p}\pi^+\pi^-$	$(\ 2.8\ \ \pm1.4\ \ ) \times 10^{-5}$	
Γ_{203}	$\gamma\gamma$	$<\ \ 1.5 \qquad \times 10^{-4}$	CL=90%
Γ_{204}	$\gamma\gamma J/\psi$	$(\ 3.1\ \ ^{+1.0}_{-1.2}\ ) \times 10^{-4}$	
Γ_{205}	$e^+e^-\eta'$	$(\ 1.90\ \ \pm0.26\ ) \times 10^{-6}$	
Γ_{206}	$e^+e^-\chi_{c0}(1P)$	$(\ 1.06\ \ \pm0.24\ ) \times 10^{-3}$	
Γ_{207}	$e^+e^-\chi_{c1}(1P)$	$(\ 8.5\ \ \pm0.6\ \ ) \times 10^{-4}$	
Γ_{208}	$e^+e^-\chi_{c2}(1P)$	$(\ 7.0\ \ \pm0.8\ \ ) \times 10^{-4}$	

Weak decays

Γ_{209}	$D^0 e^+e^- +$ c.c.	$<\ \ 1.4 \qquad \times 10^{-7}$	CL=90%

Other decays

Γ_{210}	invisible	$<\ \ 1.6 \qquad \%$	CL=90%

[a] $\Theta(1540)$ is a hypothetical pentaquark state of 1.54 GeV/c^2 mass and a width of less than 25 MeV/c^2.

[b] For a narrow resonance in the range $2.2 <\ M(X) < 2.8$ GeV.

CONSTRAINED FIT INFORMATION

A multiparticle fit to $\chi_{c1}(1P)$, $\chi_{c0}(1P)$, $\chi_{c2}(1P)$, and $\psi(2S)$ with 4 total widths, a partial width, 25 combinations of partial widths obtained from integrated cross section, and 84 branching ratios uses 248 measurements to determine 49 parameters. The overall fit has a $\chi^2 = 379.8$ for 199 degrees of freedom.

The following *off-diagonal* array elements are the correlation coefficients $\left\langle \delta p_i \delta p_j \right\rangle / (\delta p_i \cdot \delta p_j)$, in percent, from the fit to parameters p_i, including the branching fractions, $x_i \equiv \Gamma_i/\Gamma_{total}$.

	x_7	x_8	x_9	x_{12}	x_{13}	x_{14}	x_{101}	x_{162}	x_{163}	x_{164}
x_8	3									
x_9	1	0								
x_{12}	29	11	2							
x_{13}	28	6	1	48						
x_{14}	13	4	1	36	15					
x_{101}	0	0	0	4	3	2				
x_{162}	1	0	0	2	1	1	0			
x_{163}	1	0	0	2	1	1	0	0		
x_{164}	1	0	0	3	1	1	0	0	0	
Γ	-81	-4	-1	-38	-34	-16	-7	-1	-1	-1

$\psi(2S)$ PARTIAL WIDTHS

$\Gamma(\text{hadrons})$ Γ_1

VALUE (keV)	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
258 ± 26	BAI	02B	BES2	$e^+ e^-$
224 ± 56	LUTH	75	MRK1	$e^+ e^-$

$\Gamma(e^+ e^-)$ Γ_7

VALUE (keV)		DOCUMENT ID		TECN	COMMENT
2.33 ±0.04 OUR FIT					
2.29 ±0.06 OUR AVERAGE					
$2.23 \pm 0.10 \pm 0.02$	[1]	ABLIKIM	15V	BES3	4.0–4.4 $e^+ e^- \to \pi^+ \pi^- J/\psi$
$2.338 \pm 0.037 \pm 0.096$		ABLIKIM	08B	BES2	$e^+ e^- \to$ hadrons
$2.330 \pm 0.036 \pm 0.110$		ABLIKIM	06L	BES2	$e^+ e^- \to$ hadrons
2.44 ± 0.21	[2]	BAI	02B	BES2	$e^+ e^-$
2.14 ± 0.21		ALEXANDER	89	RVUE	See Υ mini-review
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$2.279 \pm 0.015 \pm 0.042$	[3]	ANASHIN	18	KEDR	$e^+ e^-$
$2.282 \pm 0.015 \pm 0.042$	[4]	ANASHIN	18	KEDR	$e^+ e^-$
2.0 ± 0.3		BRANDELIK	79C	DASP	$e^+ e^-$
2.1 ± 0.3	[5]	LUTH	75	MRK1	$e^+ e^-$

[1] ABLIKIM 15V reports $2.213 \pm 0.018 \pm 0.099$ keV from a measurement of $[\Gamma(\psi(2S) \to e^+ e^-)] \times [B(\psi(2S) \to J/\psi(1S)\pi^+ \pi^-)]$ assuming $B(\psi(2S) \to J/\psi(1S)\pi^+ \pi^-) = (34.95 \pm 0.45) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \to J/\psi(1S)\pi^+ \pi^-) = (34.68 \pm 0.30) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[2] From a simultaneous fit to $e^+ e^-$, $\mu^+ \mu^-$, and hadronic channel, assuming $\Gamma_e = \Gamma_\mu = \Gamma_\tau/0.38847$.

[3] Combining $\Gamma_{e^+ e^-} \cdot B(\mu^+ \mu^-)$ from ANASHIN 18 with $\Gamma_{e^+ e^-} \cdot B(\text{hadrons})$ from ANASHIN 12 and assuming lepton universality.

[4] From the sum of $\Gamma_{e^+ e^-} \cdot B(\text{hadrons})$ from ANASHIN 12, $\Gamma_{e^+ e^-} \cdot B(e^+ e^-)$ and $\Gamma_{e^+ e^-} \cdot B(\mu^+ \mu^-)$ from ANASHIN 18, and $\Gamma_{e^+ e^-} \cdot B(\tau^+ \tau^-)$ from ANASHIN 07.

[5] From a simultaneous fit to $e^+ e^-$, $\mu^+ \mu^-$, and hadronic channels assuming $\Gamma(e^+ e^-) = \Gamma(\mu^+ \mu^-)$.

$\Gamma(\gamma\gamma)$ $\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ Γ_{203}

VALUE (eV)	CL%	DOCUMENT ID	TECN	COMMENT
<43	90	BRANDELIK 79C	DASP	$e^+ e^-$

$\psi(2S)$ $\Gamma(i)\Gamma(e^+ e^-)/\Gamma(\text{total})$

This combination of a partial width with the partial width into $e^+ e^-$ and with the total width is obtained from the integrated cross section into channel(i) in the $e^+ e^-$ annihilation. We list only data that have not been used to determine the partial width $\Gamma(i)$ or the branching ratio $\Gamma(i)/\text{total}$.

$\Gamma(\text{hadrons}) \times \Gamma(e^+ e^-)/\Gamma_{\text{total}}$ $\qquad\qquad\qquad\qquad$ $\Gamma_1\Gamma_7/\Gamma$

VALUE (keV)	DOCUMENT ID	TECN	COMMENT
2.233±0.015±0.042	[1] ANASHIN 12	KEDR	$e^+ e^- \to$ hadrons
• • • We do not use the following data for averages, fits, limits, etc. • • •			
2.2 ±0.4	ABRAMS 75	MRK1	$e^+ e^-$

[1] ANASHIN 12 reports the value 2.233 ± 0.015 ± 0.037 ± 0.020 keV, where the third uncertainty is due to assumptions on the interference between the resonance and hadronic continuum. We combined the two systematic uncertainties.

$\Gamma(K^0_S \text{ anything}) \times \Gamma(e^+ e^-)/\Gamma_{\text{total}}$ $\qquad\qquad\qquad$ $\Gamma_6\Gamma_7/\Gamma$

VALUE (keV)	DOCUMENT ID	TECN	COMMENT
0.3738±0.0067±0.0200	ABLIKIM 21S	BES3	$e^+ e^- \to K^0_S \text{ anything}$

$\Gamma(e^+ e^-) \times \Gamma(e^+ e^-)/\Gamma_{\text{total}}$ $\qquad\qquad\qquad\qquad\qquad$ $\Gamma_7\Gamma_7/\Gamma$

VALUE (eV)	DOCUMENT ID	TECN	COMMENT
21.2±0.7±1.2	[1] ANASHIN 18	KEDR	$e^+ e^-$

[1] From the average of nine scans of the $\psi(2S)$.

$\Gamma(\mu^+ \mu^-) \times \Gamma(e^+ e^-)/\Gamma_{\text{total}}$ $\qquad\qquad\qquad\qquad$ $\Gamma_8\Gamma_7/\Gamma$

VALUE (eV)	DOCUMENT ID	TECN	COMMENT
19.3±0.3±0.5	[1] ANASHIN 18	KEDR	$\psi(2S) \to \mu^+ \mu^-$

[1] From the average of nine scans of the $\psi(2S)$.

$\Gamma(\tau^+ \tau^-) \times \Gamma(e^+ e^-)/\Gamma_{\text{total}}$ $\qquad\qquad\qquad\qquad$ $\Gamma_9\Gamma_7/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
9.0±2.6	79	[1] ANASHIN 07	KEDR	$e^+ e^- \to \psi(2S) \to \tau^+ \tau^-$

[1] Using $\psi(2S)$ total width of 337 ± 13 keV. Systematic errors not evaluated.

$\Gamma(J/\psi(1S)\pi^+ \pi^-) \times \Gamma(e^+ e^-)/\Gamma_{\text{total}}$ $\qquad\qquad$ $\Gamma_{12}\Gamma_7/\Gamma$

VALUE (keV)	EVTS	DOCUMENT ID	TECN	COMMENT
0.808±0.013 OUR FIT				
0.837±0.025 OUR AVERAGE		Error includes scale factor of 1.3. See the ideogram below.		
0.837±0.028±0.005		[1] LEES 12E	BABR	$10.6\ e^+ e^- \to 2\pi^+ 2\pi^- \gamma$
0.852±0.010±0.026	19.5k	ADAM 06	CLEO	$3.773\ e^+ e^- \to \gamma\psi(2S)$
0.68 ±0.09		[2] BAI 98E	BES	$e^+ e^-$

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

0.88 ±0.08 ±0.03	256	[3] AUBERT 07AU BABR	10.6 $e^+e^- \to J/\psi\pi^+\pi^-\gamma$
0.755$\pm$0.048$\pm$0.004	544	[4] AUBERT 05D BABR	10.6 $e^+e^- \to \pi^+\pi^-\mu^+\mu^-\gamma$

WEIGHTED AVERAGE
0.837±0.025 (Error scaled by 1.3)

Values above of weighted average, error, and scale factor are based upon the data in this ideogram only. They are not necessarily the same as our 'best' values, obtained from a least-squares constrained fit utilizing measurements of other (related) quantities as additional information.

			χ^2
LEES	12E	BABR	0.0
ADAM	06	CLEO	0.3
BAI	98E	BES	3.0
			3.3

(Confidence Level = 0.189)

[1] LEES 12E reports [$\Gamma(\psi(2S) \to J/\psi(1S)\pi^+\pi^-) \times \Gamma(\psi(2S) \to e^+e^-)/\Gamma_{total}] \times [B(J/\psi(1S) \to \mu^+\mu^-)] = (49.9 \pm 1.3 \pm 1.0) \times 10^{-3}$ keV which we divide by our best value $B(J/\psi(1S) \to \mu^+\mu^-) = (5.961 \pm 0.033) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[2] The value of $\Gamma(e^+e^-)$ quoted in BAI 98E is derived using $B(\psi(2S) \to J/\psi(1S)\pi^+\pi^-) = (32.4 \pm 2.6) \times 10^{-2}$ and $B(J/\psi(1S) \to \ell^+\ell^-) = 0.1203 \pm 0.0038$. Recalculated by us using $B(J/\psi(1S) \to \ell^+\ell^-) = 0.1181 \pm 0.0020$.

[3] AUBERT 07AU reports [$\Gamma(\psi(2S) \to J/\psi(1S)\pi^+\pi^-) \times \Gamma(\psi(2S) \to e^+e^-)/\Gamma_{total}] \times [B(J/\psi(1S) \to \pi^+\pi^-\pi^0)] = 0.0186 \pm 0.0012 \pm 0.0011$ keV which we divide by our best value $B(J/\psi(1S) \to \pi^+\pi^-\pi^0) = (2.10 \pm 0.08) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[4] AUBERT 05D reports [$\Gamma(\psi(2S) \to J/\psi(1S)\pi^+\pi^-) \times \Gamma(\psi(2S) \to e^+e^-)/\Gamma_{total}] \times [B(J/\psi(1S) \to \mu^+\mu^-)] = 0.0450 \pm 0.0018 \pm 0.0022$ keV which we divide by our best value $B(J/\psi(1S) \to \mu^+\mu^-) = (5.961 \pm 0.033) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Superseded by LEES 12E.

$\Gamma(J/\psi(1S)\pi^+\pi^-) \times \Gamma(e^+e^-)/\Gamma_{total}$ (keV)

$\Gamma(J/\psi(1S)\pi^0\pi^0) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\Gamma_{13}\Gamma_7/\Gamma$

VALUE (keV)	EVTS	DOCUMENT ID	TECN	COMMENT
0.425±0.009 OUR FIT				
0.411±0.008±0.018	3.6k	ADAM 06	CLEO	3.773 $e^+e^- \to \gamma\psi(2S)$

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

0.48 $\pm$0.09 $\pm$0.02		142	[1] LEES	18E BABR	10.6 $e^+ e^- \to$ $J/\psi \pi^0 \pi^0 \gamma$	

[1] LEES 18E reports $[\Gamma(\psi(2S) \to J/\psi(1S)\pi^0\pi^0) \times \Gamma(\psi(2S) \to e^+ e^-)/\Gamma_{total}] \times [B(J/\psi(1S) \to \pi^+\pi^-\pi^0)] = 0.0101 \pm 0.0015 \pm 0.0011$ keV which we divide by our best value $B(J/\psi(1S) \to \pi^+\pi^-\pi^0) = (2.10 \pm 0.08) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(J/\psi(1S)\eta) \times \Gamma(e^+ e^-)/\Gamma_{total}$ $\qquad\qquad$ $\Gamma_{14}\Gamma_7/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
78.6$\pm$ 1.6 OUR FIT				
87 $\pm$ 9 OUR AVERAGE				
83 $\pm$25 $\pm$5	14	[1] AUBERT	07AU BABR	10.6 $e^+ e^- \to$ $J/\psi \pi^+ \pi^- \pi^0 \gamma$
88 $\pm$ 6 $\pm$7	291 $\pm$ 24	ADAM	06 CLEO	3.773 $e^+ e^- \to \gamma \psi(2S)$

[1] AUBERT 07AU quotes $\Gamma_{ee}^{\psi(2S)} \cdot B(\psi(2S) \to J/\psi\eta) \cdot B(J/\psi \to \mu^+\mu^-) \cdot B(\eta \to \pi^+\pi^-\pi^0) = 1.11 \pm 0.33 \pm 0.07$ eV.

$\Gamma(J/\psi(1S)\pi^0) \times \Gamma(e^+ e^-)/\Gamma_{total}$ $\qquad\qquad$ $\Gamma_{15}\Gamma_7/\Gamma$

VALUE (eV)	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
<8	90	<37	ADAM	06 CLEO	3.773 $e^+ e^- \to \gamma \psi(2S)$

$\Gamma(2(\pi^+ \pi^-)\pi^0) \times \Gamma(e^+ e^-)/\Gamma_{total}$ $\qquad\qquad$ $\Gamma_{22}\Gamma_7/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
29.7$\pm$2.2$\pm$1.8	410	AUBERT	07AU BABR	10.6 $e^+ e^- \to 2(\pi^+ \pi^-)\pi^0 \gamma$

$\Gamma(\pi^+ \pi^- \pi^0 \pi^0 \pi^0) \times \Gamma(e^+ e^-)/\Gamma_{total}$ $\qquad\qquad$ $\Gamma_{24}\Gamma_7/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
12.4$\pm$1.8$\pm$1.2	177	LEES	18E BABR	10.6 $e^+ e^- \to \pi^+ \pi^- 3\pi^0 \gamma$

$\Gamma(\pi^+ \pi^- 4\pi^0) \times \Gamma(e^+ e^-)/\Gamma_{total}$ $\qquad\qquad$ $\Gamma_{25}\Gamma_7/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
3.3$\pm$2.3$\pm$0.5	18	LEES	21C BABR	$e^+ e^- \to \gamma_{ISR}(\pi^+ \pi^- 4\pi^0)$

$\Gamma(\rho^{\pm} \pi^{\mp} \pi^0 \pi^0) \times \Gamma(e^+ e^-)/\Gamma_{total}$ $\qquad\qquad$ $\Gamma_{26}\Gamma_7/\Gamma$

VALUE (eV)	CL%	DOCUMENT ID	TECN	COMMENT
<6.2	90	LEES	18E BABR	10.6 $e^+ e^- \to \pi^+ \pi^- 3\pi^0 \gamma$

$\Gamma(2(\pi^+ \pi^- \pi^0)) \times \Gamma(e^+ e^-)/\Gamma_{total}$ $\qquad\qquad$ $\Gamma_{28}\Gamma_7/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
11.2$\pm$3.3$\pm$1.3	43	AUBERT	06D BABR	10.6 $e^+ e^- \to 2(\pi^+ \pi^- \pi^0)\gamma$

$\Gamma(2(\pi^+ \pi^-)3\pi^0) \times \Gamma(e^+ e^-)/\Gamma_{total}$ $\qquad\qquad$ $\Gamma_{30}\Gamma_7/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
33$\pm$5$\pm$5	14k	LEES	21 BABR	10.6 $e^+ e^- \to$ $2(\pi^+ \pi^-)3\pi^0 \gamma$

$\Gamma(\eta 2(\pi^+\pi^-)) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\qquad$ $\Gamma_{33}\Gamma_7/\Gamma$

VALUE (eV)	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
2.87±1.41±0.01		16	[1] AUBERT	07AU BABR	10.6 $e^+e^- \to$ $2(\pi^+\pi^-)\eta\gamma$

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

<7	90	14k	[2] LEES	21 BABR	10.6 $e^+e^- \to$ $2(\pi^+\pi^-)3\pi^0\gamma$

[1] AUBERT 07AU reports $[\Gamma(\psi(2S) \to \eta 2(\pi^+\pi^-)) \times \Gamma(\psi(2S) \to e^+e^-)/\Gamma_{total}] \times [B(\eta \to 2\gamma)] = 1.13 \pm 0.55 \pm 0.08$ eV which we divide by our best value $B(\eta \to 2\gamma) = (39.36 \pm 0.18) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[2] LEES 21 reports $[\Gamma(\psi(2S) \to \eta 2(\pi^+\pi^-)) \times \Gamma(\psi(2S) \to e^+e^-)/\Gamma_{total}] \times [B(\eta \to 3\pi^0)] < 2.3$ eV which we divide by our best value $B(\eta \to 3\pi^0) = 32.57 \times 10^{-2}$.

$\Gamma(\eta \pi^+\pi^-\pi^0\pi^0) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\qquad$ $\Gamma_{34}\Gamma_7/\Gamma$

VALUE (eV)	CL%	DOCUMENT ID	TECN	COMMENT
<0.85	90	LEES	18E BABR	10.6 $e^+e^- \to$ $\pi^+\pi^-\pi^0\pi^0\eta\gamma$

$\Gamma(\eta \pi^+\pi^- 3\pi^0) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\qquad$ $\Gamma_{35}\Gamma_7/\Gamma$

VALUE (eV)	CL%	DOCUMENT ID	TECN	COMMENT
<5	90	[1] LEES	21C BABR	$e^+e^- \to \gamma_{ISR}(\pi^+\pi^- 3\pi^0\gamma\gamma)$

[1] LEES 21C reports $[\Gamma(\psi(2S) \to \eta\pi^+\pi^- 3\pi^0) \times \Gamma(\psi(2S) \to e^+e^-)/\Gamma_{total}] \times [B(\eta \to 2\gamma)] < 1.9$ eV which we divide by our best value $B(\eta \to 2\gamma) = 39.36 \times 10^{-2}$.

$\Gamma(\eta 2(\pi^+\pi^-\pi^0)) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\qquad$ $\Gamma_{36}\Gamma_7/\Gamma$

VALUE (eV)	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
<5	90	14k	[1] LEES	21 BABR	10.6 $e^+e^- \to$ $2(\pi^+\pi^-)3\pi^0\gamma$

[1] LEES 21 reports $[\Gamma(\psi(2S) \to \eta 2(\pi^+\pi^-\pi^0)) \times \Gamma(\psi(2S) \to e^+e^-)/\Gamma_{total}] \times [B(\eta \to 2\gamma)] < 1.9$ eV which we divide by our best value $B(\eta \to 2\gamma) = 39.36 \times 10^{-2}$.

$\Gamma(\omega \pi^+\pi^-) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\qquad$ $\Gamma_{41}\Gamma_7/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
3.01±0.84±0.02	37	[1] AUBERT	07AU BABR	10.6 $e^+e^- \to \omega\pi^+\pi^-\gamma$

[1] AUBERT 07AU reports $[\Gamma(\psi(2S) \to \omega\pi^+\pi^-) \times \Gamma(\psi(2S) \to e^+e^-)/\Gamma_{total}] \times [B(\omega(782) \to \pi^+\pi^-\pi^0)] = 2.69 \pm 0.73 \pm 0.16$ eV which we divide by our best value $B(\omega(782) \to \pi^+\pi^-\pi^0) = (89.2 \pm 0.7) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\omega \pi^+\pi^- 2\pi^0) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\qquad$ $\Gamma_{42}\Gamma_7/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
20.2±5.6±0.1	14k	[1] LEES	21 BABR	10.6 $e^+e^- \to$ $2(\pi^+\pi^-)3\pi^0\gamma$

[1] LEES 21 reports $[\Gamma(\psi(2S) \to \omega\pi^+\pi^- 2\pi^0) \times \Gamma(\psi(2S) \to e^+e^-)/\Gamma_{total}] \times [B(\omega(782) \to \pi^+\pi^-\pi^0)] = 18 \pm 4 \pm 3$ eV which we divide by our best value $B(\omega(782) \to \pi^+\pi^-\pi^0) = (89.2 \pm 0.7) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\omega\pi^0\pi^0) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\qquad$ $\Gamma_{45}\Gamma_7/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID		TECN	COMMENT
2.58±0.82±0.02	33	[1] LEES	18E	BABR	10.6 $e^+e^- \to \pi^+\pi^-3\pi^0\gamma$

[1] LEES 18E reports $[\Gamma(\psi(2S) \to \omega\pi^0\pi^0) \times \Gamma(\psi(2S) \to e^+e^-)/\Gamma_{total}] \times [B(\omega(782) \to \pi^+\pi^-\pi^0)] = 2.3 \pm 0.7 \pm 0.2$ eV which we divide by our best value $B(\omega(782) \to \pi^+\pi^-\pi^0) = (89.2 \pm 0.7) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\omega 3\pi^0) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\qquad$ $\Gamma_{46}\Gamma_7/\Gamma$

VALUE (eV)	CL%	DOCUMENT ID		TECN	COMMENT
<1.8	90	[1] LEES	21C	BABR	$e^+e^- \to \gamma_{ISR}(\pi^+\pi^-4\pi^0)$

[1] LEES 21C reports $[\Gamma(\psi(2S) \to \omega 3\pi^0) \times \Gamma(\psi(2S) \to e^+e^-)/\Gamma_{total}] \times [B(\omega(782) \to \pi^+\pi^-\pi^0)] < 1.6$ eV which we divide by our best value $B(\omega(782) \to \pi^+\pi^-\pi^0) = 89.2 \times 10^{-2}$.

$\Gamma(\phi\pi^+\pi^-) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\qquad$ $\Gamma_{51}\Gamma_7/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID		TECN	COMMENT
0.55±0.19±0.01	19	[1] LEES	12F	BABR	10.6 $e^+e^- \to K^+K^-\pi^+\pi^-\gamma$

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

0.57±0.23±0.01	10	[2] AUBERT,BE	06D	BABR	10.6 $e^+e^- \to K^+K^-\pi^+\pi^-\gamma$

[1] LEES 12F reports $[\Gamma(\psi(2S) \to \phi\pi^+\pi^-) \times \Gamma(\psi(2S) \to e^+e^-)/\Gamma_{total}] \times [B(\phi(1020) \to K^+K^-)] = 0.27 \pm 0.09 \pm 0.02$ eV which we divide by our best value $B(\phi(1020) \to K^+K^-) = (49.1 \pm 0.5) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[2] Superseded by LEES 12F. AUBERT,BE 06D reports $[\Gamma(\psi(2S) \to \phi\pi^+\pi^-) \times \Gamma(\psi(2S) \to e^+e^-)/\Gamma_{total}] \times [B(\phi(1020) \to K^+K^-)] = 0.28 \pm 0.11 \pm 0.02$ eV which we divide by our best value $B(\phi(1020) \to K^+K^-) = (49.1 \pm 0.5) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\phi f_0(980) \to \pi^+\pi^-) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\qquad$ $\Gamma_{52}\Gamma_7/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID		TECN	COMMENT
0.346±0.129±0.004	12	[1] LEES	12F	BABR	10.6 $e^+e^- \to \pi^+\pi^-K^+K^-\gamma$

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

0.346±0.168±0.004	6 ± 3	[2] AUBERT	07AK	BABR	10.6 $e^+e^- \to \pi^+\pi^-K^+K^-\gamma$

[1] LEES 12F reports $[\Gamma(\psi(2S) \to \phi f_0(980) \to \pi^+\pi^-) \times \Gamma(\psi(2S) \to e^+e^-)/\Gamma_{total}] \times [B(\phi(1020) \to K^+K^-)] = 0.17 \pm 0.06 \pm 0.02$ eV which we divide by our best value $B(\phi(1020) \to K^+K^-) = (49.1 \pm 0.5) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[2] Superseded by LEES 12F. AUBERT 07AK reports $[\Gamma(\psi(2S) \to \phi f_0(980) \to \pi^+\pi^-) \times \Gamma(\psi(2S) \to e^+e^-)/\Gamma_{total}] \times [B(\phi(1020) \to K^+K^-)] = 0.17 \pm 0.08 \pm 0.02$ eV which we divide by our best value $B(\phi(1020) \to K^+K^-) = (49.1 \pm 0.5) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(K^+K^-) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\Gamma_{59}\Gamma_7/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$0.147\pm0.035\pm0.005$	66	[1] LEES	15J	BABR	$e^+e^- \to K^+K^-\gamma$
$0.197\pm0.035\pm0.005$	66	[2] LEES	15J	BABR	$e^+e^- \to K^+K^-\gamma$
$0.35\ \pm0.14\ \pm0.03$	11	[3] LEES	13Q	BABR	$e^+e^- \to K^+K^-\gamma$

[1] $\sin\phi > 0$.
[2] $\sin\phi < 0$.
[3] Interference with non-resonant K^+K^- production not taken into account.

$\Gamma(K^+K^-\pi^+) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\Gamma_{60}\Gamma_7/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID		TECN	COMMENT
$1.92\pm0.30\pm0.06$	133	LEES	12F	BABR	$10.6\ e^+e^- \to \pi^+\pi^-K^+K^-\gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$2.56\pm0.42\pm0.16$	85	[1] AUBERT	07AK	BABR	$10.6\ e^+e^- \to \pi^+\pi^-K^+K^-\gamma$

[1] Superseded by LEES 12F.

$\Gamma(K_S^0 K_L^0 \pi^0) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\Gamma_{64}\Gamma_7/\Gamma$

VALUE (eV)	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
<0.7	90	8	LEES	17A	BABR	$e^+e^- \to K_S^0 K_L^0 \pi^0 \gamma$

$\Gamma(K^+K^-\pi^0\pi^0) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\Gamma_{65}\Gamma_7/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID		TECN	COMMENT
$0.60\pm0.31\pm0.03$	17	LEES	12F	BABR	$10.6\ e^+e^- \to \pi^0\pi^0 K^+K^-\gamma$

$\Gamma(K^+K^-\pi^+\pi^-\pi^0) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\Gamma_{66}\Gamma_7/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID		TECN	COMMENT
$4.4\pm1.3\pm0.3$	32	AUBERT	07AU	BABR	$10.6\ e^+e^- \to K^+K^-\pi^+\pi^-\pi^0\gamma$

$\Gamma(K_S^0 K_L^0 \pi^0\pi^0) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\Gamma_{73}\Gamma_7/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID		TECN	COMMENT
$2.92\pm1.27\pm0.15$	14	LEES	17A	BABR	$e^+e^- \to K_S^0 K_L^0 \pi^0\pi^0\gamma$

$\Gamma(K_S^0 K_L^0 \eta) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\Gamma_{74}\Gamma_7/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID		TECN	COMMENT
$3.14\pm1.08\pm0.16$	16	LEES	17A	BABR	$e^+e^- \to K_S^0 K_L^0 \eta\gamma$

$\Gamma(K^+K^-\pi^+\pi^-\eta) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\Gamma_{77}\Gamma_7/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID		TECN	COMMENT
$3.05\pm1.80\pm0.01$	7	[1] AUBERT	07AU	BABR	$10.6\ e^+e^- \to K^+K^-\pi^+\pi^-\eta\gamma$

[1] AUBERT 07AU reports $[\Gamma(\psi(2S) \to K^+K^-\pi^+\pi^-\eta) \times \Gamma(\psi(2S) \to e^+e^-)/\Gamma_{total}]$ $\times [B(\eta \to 2\gamma)] = 1.2 \pm 0.7 \pm 0.1$ eV which we divide by our best value $B(\eta \to 2\gamma) = (39.36 \pm 0.18) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(K^+ K^- 2(\pi^+ \pi^-)) \times \Gamma(e^+ e^-)/\Gamma_{total}$ $\qquad$ $\Gamma_{78}\Gamma_7/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
4.4±2.1±0.3	26	AUBERT	06D BABR	10.6 $e^+ e^- \to$ $K^+ K^- 2(\pi^+ \pi^-)\gamma$

$\Gamma(2(K^+ K^-)) \times \Gamma(e^+ e^-)/\Gamma_{total}$ $\qquad$ $\Gamma_{81}\Gamma_7/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
0.22±0.10±0.02	13	LEES	12F BABR	10.6 $e^+ e^- \to$ $K^+ K^- K^+ K^- \gamma$

$\Gamma(p\overline{p}) \times \Gamma(e^+ e^-)/\Gamma_{total}$ $\qquad$ $\Gamma_{101}\Gamma_7/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
0.686±0.019 OUR FIT				
0.63 ±0.05 OUR AVERAGE		Error includes scale factor of 1.2.		
0.67 ±0.12 ±0.02	43	[1] LEES	13O BABR	$e^+ e^- \to p\overline{p}\gamma$
0.74 ±0.07 ±0.04	142	[2] LEES	13Y BABR	$e^+ e^- \to p\overline{p}\gamma$
0.579±0.038±0.036	2.7k	ANDREOTTI 07	E835	$p\overline{p} \to e^+ e^-,\ J/\psi X$

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

0.70 ±0.17 ±0.03	22	[3] AUBERT	06B BABR	$e^+ e^- \to p\overline{p}\gamma$

[1] ISR photon reconstructed in the detector
[2] ISR photon undetected
[3] Superseded by LEES 13O

$\Gamma(\Lambda\overline{\Lambda}) \times \Gamma(e^+ e^-)/\Gamma_{total}$ $\qquad$ $\Gamma_{124}\Gamma_7/\Gamma$

VALUE (eV)	DOCUMENT ID	TECN	COMMENT
1.5±0.4±0.1	AUBERT	07BD BABR	10.6 $e^+ e^- \to \Lambda\overline{\Lambda}\gamma$

$\psi(2S)$ BRANCHING RATIOS

$\Gamma(\text{hadrons})/\Gamma_{total}$ $\qquad$ Γ_1/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
0.9785±0.0013 OUR AVERAGE			
0.9779±0.0015	[1] BAI	02B BES2	$e^+ e^-$
0.981 ±0.003	[1] LUTH	75 MRK1	$e^+ e^-$

[1] Includes cascade decay into $J/\psi(1S)$.

$\Gamma(\text{virtual}\,\gamma \to \text{hadrons})/\Gamma_{total}$ $\qquad$ Γ_2/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
0.0173±0.0014 OUR AVERAGE	Error includes scale factor of 1.5.		
0.0166±0.0010	[1,2] SETH	04 RVUE	$e^+ e^-$
0.0199±0.0019	[1] BAI	02B BES2	$e^+ e^-$

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

0.029 ±0.004	[1] LUTH	75 MRK1	$e^+ e^-$

[1] Included in $\Gamma(\text{hadrons})/\Gamma_{total}$.
[2] Using B($\psi(2S) \to \ell^+ \ell^-$) = (0.73 ± 0.04)% from RPP-2002 and R = 2.28 ± 0.04 determined by a fit to data from BAI 00 and BAI 02C.

$\Gamma(ggg)/\Gamma_{total}$ $\qquad$ Γ_3/Γ

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
10.58±1.62	2.9 M	[1] LIBBY	09	CLEO	$\psi(2S) \to$ hadrons

[1] Calculated using $\Gamma(\gamma gg)/\Gamma(ggg) = 0.097 \pm 0.026 \pm 0.016$ from LIBBY 09, B($\psi(2S) \to X J/\psi$) relative and absolute branching fractions from MENDEZ 08, B($\psi(2S) \to \gamma\eta_c$) from MITCHELL 09, and B($\psi(2S) \to$ virtual $\gamma \to$ hadrons), B($\psi(2S) \to \gamma\chi_{cJ}$), and B($\psi(2S) \to \ell^+\ell^-$) from PDG 08. The statistical error is negligible and the systematic error is largely uncorrelated with that of $\Gamma(\gamma gg)/\Gamma_{total}$ LIBBY 09 measurement.

$\Gamma(\gamma gg)/\Gamma_{total}$ $\qquad$ Γ_4/Γ

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
1.025±0.288	200 k	[1] LIBBY	09	CLEO	$\psi(2S) \to \gamma +$ hadrons

[1] Calculated using $\Gamma(\gamma gg)/\Gamma(ggg) = 0.097 \pm 0.026 \pm 0.016$ from LIBBY 09. The statistical error is negligible and the systematic error is largely uncorrelated with that of $\Gamma(ggg)/\Gamma_{total}$ LIBBY 09 measurement.

$\Gamma(\gamma gg)/\Gamma(ggg)$ $\qquad$ Γ_4/Γ_3

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
9.7±2.6±1.6	2.9 M	LIBBY	09	CLEO	$\psi(2S) \to (\gamma +)$ hadrons

$\Gamma(\text{light hadrons})/\Gamma_{total}$ $\qquad$ Γ_5/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
0.154±0.015	[1] MENDEZ	08	CLEO	$e^+e^- \to \psi(2S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.169±0.026	[2] ADAM	05A	CLEO	$e^+e^- \to \psi(2S)$

[1] Uses B($\psi(2S) \to J/\psi X$) from MENDEZ 08 and other branching fractions from PDG 07.
[2] Uses B($J/\psi X$) from ADAM 05A, B($\chi_{cJ}\gamma$), B($\eta_c\gamma$) from ATHAR 04 and B($\ell^+\ell^-$) from PDG 04. Superseded by MENDEZ 08.

$\Gamma(e^+e^-)/\Gamma_{total}$ $\qquad$ Γ_7/Γ

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
79.3± 1.7 OUR FIT				
• • • We do not use the following data for averages, fits, limits, etc. • • •				
88 ±13	[1] FELDMAN	77	RVUE	e^+e^-

[1] From an overall fit assuming equal partial widths for e^+e^- and $\mu^+\mu^-$. For a measurement of the ratio see the entry $\Gamma(\mu^+\mu^-)/\Gamma(e^+e^-)$ below. Includes LUTH 75, HILGER 75, BURMESTER 77.

$\Gamma(\mu^+\mu^-)/\Gamma_{total}$ $\qquad$ Γ_8/Γ

VALUE (units 10^{-4})	DOCUMENT ID
80±6 OUR FIT	

$\Gamma(\mu^+\mu^-)/\Gamma(e^+e^-)$ $\qquad$ Γ_8/Γ_7

VALUE	DOCUMENT ID		TECN	COMMENT
1.00±0.08 OUR FIT				
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.89±0.16	BOYARSKI	75C	MRK1	e^+e^-

$\Gamma(\tau^+\tau^-)/\Gamma_{\text{total}}$ $\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ Γ_9/Γ

VALUE (units 10^{-4})	DOCUMENT ID	TECN	COMMENT
31 ±4 OUR FIT			
30.8±2.1±3.8	[1] ABLIKIM 06W BES		$e^+e^- \to \psi(2S)$

[1] Computed using PDG 02 value of B($\psi(2S) \to$ hadrons) $= 0.9810 \pm 0.0030$ to estimate the total number of $\psi(2S)$ events.

$$\text{------- DECAYS INTO } J/\psi(1S) \text{ AND ANYTHING -------}$$

$\Gamma(J/\psi(1S)\text{anything})/\Gamma_{\text{total}}$
$\Gamma_{10}/\Gamma = (\Gamma_{12}+\Gamma_{13}+\Gamma_{14}+0.343\Gamma_{163}+0.190\Gamma_{164})/\Gamma$

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
0.614 ±0.006 OUR FIT				
0.55 ±0.07 OUR AVERAGE				
0.51 ±0.12		BRANDELIK 79C	DASP	$e^+e^- \to \mu^+\mu^- X$
0.57 ±0.08		ABRAMS 75B	MRK1	$e^+e^- \to \mu^+\mu^- X$

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

|				
0.644 ±0.006 ±0.016		[1] ABLIKIM 21Z	BES3	$e^+e^- \to \ell^+\ell^- X$
0.6254±0.0016±0.0155	1.1M	[2] MENDEZ 08	CLEO	$\psi(2S) \to \ell^+\ell^- X$
0.5950±0.0015±0.0190	151k	ADAM 05A	CLEO	Repl. by MENDEZ 08

[1] From a fit to the $e^+e^- \to J/\psi X$ cross section between 3.645 and 3.891 GeV, with $\Gamma(ee)$ and Γ fixed to the PDG 20 values of the cross particle fit which are correlated to "OUR FIT" value for B($\psi(2S) \to J/\psi X$).

[2] Not independent from other measurements of MENDEZ 08.

$\Gamma(e^+e^-)/\Gamma(J/\psi(1S)\text{anything})$ $\qquad\qquad\qquad\qquad\qquad$ Γ_7/Γ_{10}

VALUE (units 10^{-2})	EVTS	DOCUMENT ID	TECN	COMMENT
1.291±0.026 OUR FIT				
1.28 ±0.04 OUR AVERAGE	Error includes scale factor of 1.6. See the ideogram below.			
1.22 ±0.02 ±0.05	5097 ± 73	[1] ANDREOTTI 05	E835	$p\overline{p} \to \psi(2S) \to e^+e^-$
1.28 ±0.03 ±0.02		[1] AMBROGIANI 00A	E835	$p\overline{p} \to \psi(2S)$
1.44 ±0.08 ±0.02		[1] ARMSTRONG 97	E760	$\overline{p}p \to \psi(2S)$

[1] Using B($J/\psi(1S) \to e^+e^-$) $= 0.0593 \pm 0.0010$.

WEIGHTED AVERAGE
1.28±0.04 (Error scaled by 1.6)
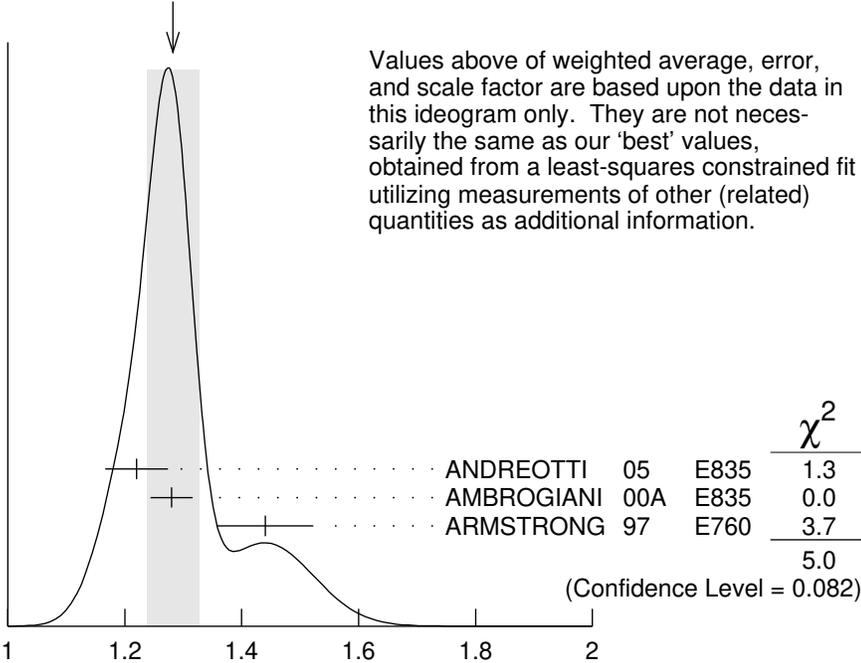
Values above of weighted average, error,
and scale factor are based upon the data in
this ideogram only. They are not neces-
sarily the same as our 'best' values,
obtained from a least-squares constrained fit
utilizing measurements of other (related)
quantities as additional information.

			χ^2
ANDREOTTI	05	E835	1.3
AMBROGIANI	00A	E835	0.0
ARMSTRONG	97	E760	3.7
			5.0

(Confidence Level = 0.082)

$\Gamma\left(e^+ e^-\right)/\Gamma\left(J/\psi(1S)\,\text{anything}\right)$ Γ_7/Γ_{10}
(units 10^{-2})

$\Gamma\left(\mu^+\mu^-\right)/\Gamma\left(J/\psi(1S)\,\text{anything}\right)$ Γ_8/Γ_{10}

VALUE	DOCUMENT ID	TECN	COMMENT
0.0130±0.0010 OUR FIT			
0.014 ±0.003	HILGER 75	SPEC	e^+e^-

$\Gamma\left(J/\psi(1S)\,\text{neutrals}\right)/\Gamma_{\text{total}}$ Γ_{11}/Γ

VALUE	DOCUMENT ID
0.2538±0.0032 OUR FIT	

$\Gamma\left(J/\psi(1S)\pi^+\pi^-\right)/\Gamma_{\text{total}}$ Γ_{12}/Γ

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
0.3468±0.0030 OUR FIT				
0.348 ±0.005 OUR AVERAGE		Error includes scale factor of 1.3. See the ideogram		
below.				
0.3498±0.0002±0.0045	20M	ABLIKIM 13R	BES3	$\psi(2S) \to J/\psi\pi^+\pi^-$
0.3504±0.0007±0.0077	565k	MENDEZ 08	CLEO	$\psi(2S) \to \ell^+\ell^-\pi^+\pi^-$
0.323 ±0.014		BAI 02B	BES2	e^+e^-
0.32 ±0.04		ABRAMS 75B	MRK1	$e^+e^- \to J/\psi\pi^+\pi^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.3354±0.0014±0.0110	60k	[1]ADAM 05A	CLEO	Repl. by MENDEZ 08

WEIGHTED AVERAGE
0.348±0.005 (Error scaled by 1.3)

Values above of weighted average, error, and scale factor are based upon the data in this ideogram only. They are not neces- sarily the same as our 'best' values, obtained from a least-squares constrained fit utilizing measurements of other (related) quantities as additional information.

			χ^2
ABLIKIM	13R	BES3	0.2
MENDEZ	08	CLEO	0.1
BAI	02B	BES2	3.1
ABRAMS	75B	MRK1	
			3.4

(Confidence Level = 0.178)

0.25   0.3   0.35   0.4   0.45
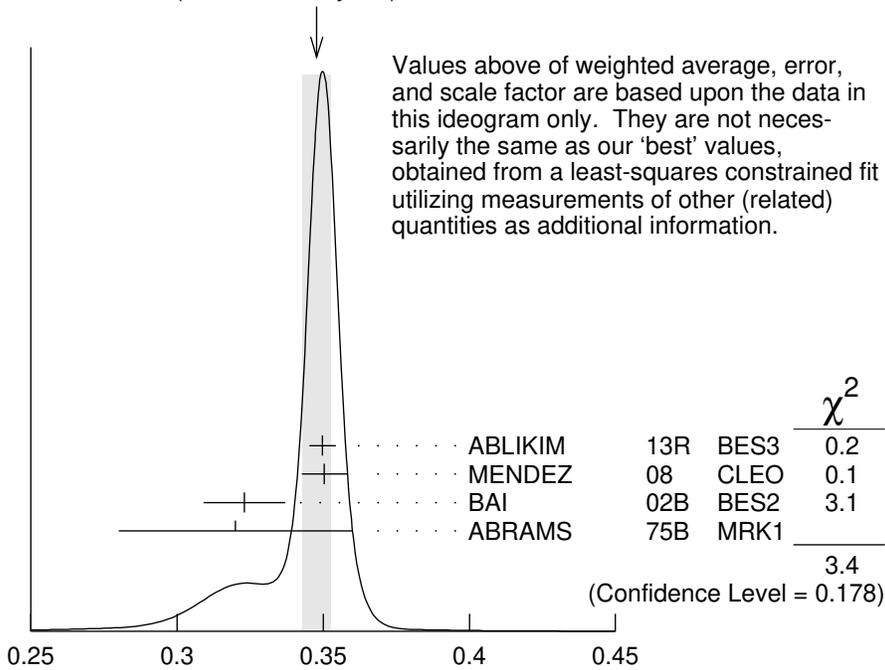
[1] Not independent from other values reported by ADAM 05A.

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

$\Gamma(e^+e^-)/\Gamma(J/\psi(1S)\pi^+\pi^-)$ Γ_7/Γ_{12}

VALUE	DOCUMENT ID	TECN	COMMENT
0.0229±0.0005 OUR FIT			
0.0252±0.0028±0.0011	[1] AUBERT	02B BABR	e^+e^-

[1] Using B($J/\psi(1S) \to e^+e^-$) = 0.0593 ± 0.0010.

$\Gamma(\mu^+\mu^-)/\Gamma(J/\psi(1S)\pi^+\pi^-)$ Γ_8/Γ_{12}

VALUE	DOCUMENT ID	TECN	COMMENT
0.0230±0.0017 OUR FIT			
0.0228±0.0018 OUR AVERAGE			
0.0230±0.0020±0.0012	[1] AAIJ	16Y LHCB	$\Lambda_b^0 \to \psi(2S)X$
0.0216±0.0026±0.0014	[2] AUBERT	02B BABR	e^+e^-
0.0327±0.0077±0.0072	[2] GRIBUSHIN	96 FMPS	515 π^- Be $\to 2\mu X$

[1] Using B($J/\psi(1S) \to \mu^+\mu^-$) = (5.961 ± 0.033) × 10^{-2}.
[2] Using B($J/\psi(1S) \to \mu^+\mu^-$) = (5.88 ± 0.10) × 10^{-2}.

$\Gamma(\tau^+\tau^-)/\Gamma(J/\psi(1S)\pi^+\pi^-)$ Γ_9/Γ_{12}

VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
8.8 ±1.1 OUR FIT			
8.73±1.39±1.57	BAI	02 BES	e^+e^-

$\Gamma\big(J/\psi(1S)\pi^+\pi^-\big)/\Gamma\big(J/\psi(1S)\,\text{anything}\big)$ Γ_{12}/Γ_{10}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.5645±0.0026 OUR FIT					
0.554 ±0.008 OUR AVERAGE		Error includes scale factor of 1.3. See the ideogram below.			
0.5604±0.0009±0.0062	565k	MENDEZ	08	CLEO	$\psi(2S) \to \ell^+\ell^-\pi^+\pi^-$
0.525 ±0.009 ±0.022	4k	ANDREOTTI	05	E835	$\psi(2S) \to J/\psi X$
0.536 ±0.007 ±0.016	20k	[1,2]ABLIKIM	04B	BES	$\psi(2S) \to J/\psi X$
0.496 ±0.037		ARMSTRONG	97	E760	$\overline{p}p \to \psi(2S)$

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

0.5637±0.0027±0.0046	60k	ADAM	05A	CLEO	Repl. by MENDEZ 08

WEIGHTED AVERAGE
0.554±0.008 (Error scaled by 1.3)

Values above of weighted average, error, and scale factor are based upon the data in this ideogram only. They are not necessarily the same as our 'best' values, obtained from a least-squares constrained fit utilizing measurements of other (related) quantities as additional information.

			χ^2
MENDEZ	08	CLEO	0.9
ANDREOTTI	05	E835	1.5
ABLIKIM	04B	BES	1.1
ARMSTRONG	97	E760	
			3.6

(Confidence Level = 0.168)

[1] From a fit to the J/ψ recoil mass spectra.
[2] ABLIKIM 04B quotes $B(\psi(2S) \to J/\psi X) / B(\psi(2S) \to J/\psi\pi^+\pi^-)$.
$\Gamma\big(J/\psi(1S)\pi^+\pi^-\big)/\Gamma\big(J/\psi(1S)\,\text{anything}\big)$

$\Gamma\big(J/\psi(1S)\,\text{neutrals}\big)/\Gamma\big(J/\psi(1S)\pi^+\pi^-\big)$
$\Gamma_{11}/\Gamma_{12} = (0.9761\Gamma_{13}+0.719\Gamma_{14}+0.343\Gamma_{163}+0.190\Gamma_{164})/\Gamma_{12}$

VALUE	DOCUMENT ID		TECN	COMMENT
0.732±0.008 OUR FIT				
0.73 ±0.09	TANENBAUM	76	MRK1	e^+e^-

$\Gamma\big(J/\psi(1S)\pi^0\pi^0\big)/\Gamma_{\text{total}}$ Γ_{13}/Γ

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
0.1824±0.0031 OUR FIT				

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

$0.1769 \pm 0.0008 \pm 0.0053$	61k	[1] MENDEZ	08	CLEO	$\psi(2S) \to \ell^+\ell^- 2\pi^0$
$0.1652 \pm 0.0014 \pm 0.0058$	13.4k	[2] ADAM	05A	CLEO	Repl. by MENDEZ 08

[1] Not independent from other measurements of MENDEZ 08.
[2] Not independent from other values reported by ADAM 05A.

$\Gamma(J/\psi(1S)\pi^0\pi^0)/\Gamma(J/\psi(1S)\text{anything})$ $\qquad$ Γ_{13}/Γ_{10}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.2968±0.0031 OUR FIT					
0.320 ±0.012 OUR AVERAGE					
$0.300 \pm 0.008 \pm 0.022$	1655 ± 44	ANDREOTTI	05	E835	$\psi(2S) \to J/\psi X$
$0.328 \pm 0.013 \pm 0.008$		AMBROGIANI	00A	E835	$p\overline{p} \to \psi(2S)$
0.323 ± 0.033		ARMSTRONG	97	E760	$\overline{p}p \to \psi(2S)$

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

$0.2829 \pm 0.0012 \pm 0.0056$	61k	MENDEZ	08	CLEO	$\psi(2S) \to \ell^+\ell^- 2\pi^0$
$0.2776 \pm 0.0025 \pm 0.0043$	13.4k	ADAM	05A	CLEO	Repl. by MENDEZ 08

$\Gamma(J/\psi(1S)\pi^0\pi^0)/\Gamma(J/\psi(1S)\pi^+\pi^-)$ $\qquad$ Γ_{13}/Γ_{12}

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.526 ±0.008 OUR FIT					
0.513 ±0.022 OUR AVERAGE Error includes scale factor of 2.2.					
$0.5047 \pm 0.0022 \pm 0.0102$	61k	MENDEZ	08	CLEO	$\psi(2S) \to \ell^+\ell^- 2\pi^0$
$0.570 \pm 0.009 \pm 0.026$	14k	[1] ABLIKIM	04B	BES	$\psi(2S) \to J/\psi X$

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

$0.4924 \pm 0.0047 \pm 0.0086$	73k	[2,3] ADAM	05A	CLEO	Repl. by MENDEZ 08
$0.571 \pm 0.018 \pm 0.044$		[4] ANDREOTTI	05	E835	$\psi(2S) \to J/\psi X$
0.53 ± 0.06		TANENBAUM	76	MRK1	e^+e^-
0.64 ± 0.15		[5] HILGER	75	SPEC	e^+e^-

[1] From a fit to the J/ψ recoil mass spectra.
[2] Not independent from other values reported by ADAM 05A.
[3] Using 13,217 $J/\psi\pi^0\pi^0$ and 60,010 $J/\psi\pi^+\pi^-$ events.
[4] Not independent from other values reported by ANDREOTTI 05.
[5] Ignoring the $J/\psi(1S)\eta$ and $J/\psi(1S)\gamma\gamma$ decays.

$\Gamma(J/\psi(1S)\eta)/\Gamma_{\text{total}}$ $\qquad$ Γ_{14}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
33.7 ± 0.5 OUR FIT					
32.9 ± 1.7 OUR AVERAGE Error includes scale factor of 2.1. See the ideogram below.					
$33.75 \pm 0.17 \pm 0.86$	68.2k	ABLIKIM	12M	BES3	$e^+e^- \to \ell^+\ell^- 2\gamma$
$29.8 \pm 0.9 \pm 2.3$	5.7k	BAI	04I	BES2	$\psi(2S) \to J/\psi\gamma\gamma$
25.5 ± 2.9	386	[1] OREGLIA	80	CBAL	$e^+e^- \to J/\psi 2\gamma$
45 ± 12	17	[2] BRANDELIK	79B	DASP	$e^+e^- \to J/\psi 2\gamma$
42 ± 6	164	[2] BARTEL	78B	CNTR	e^+e^-

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

$34.3 \pm 0.4 \pm 0.9$	18.4k	[3] MENDEZ	08	CLEO	$\psi(2S) \to \ell^+\ell^-\eta$
$32.5 \pm 0.6 \pm 1.1$	2.8k	[4] ADAM	05A	CLEO	Repl. by MENDEZ 08
43 ± 8	44	TANENBAUM	76	MRK1	e^+e^-

WEIGHTED AVERAGE
32.9±1.7 (Error scaled by 2.1)
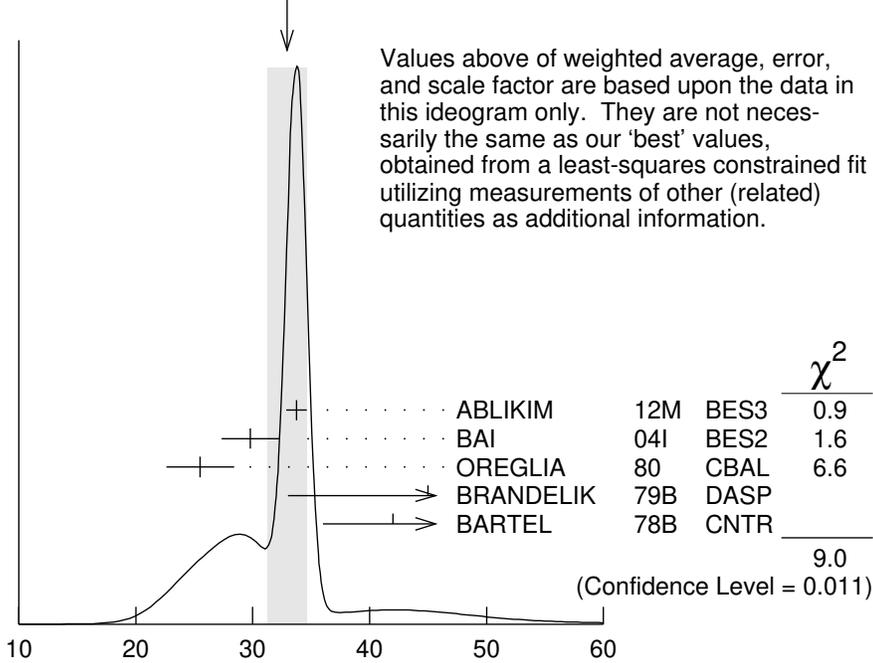
Values above of weighted average, error, and scale factor are based upon the data in this ideogram only. They are not neces- sarily the same as our 'best' values, obtained from a least-squares constrained fit utilizing measurements of other (related) quantities as additional information.

			χ^2
ABLIKIM	12M	BES3	0.9
BAI	04I	BES2	1.6
OREGLIA	80	CBAL	6.6
BRANDELIK	79B	DASP	
BARTEL	78B	CNTR	
			9.0

(Confidence Level = 0.011)

10   20   30   40   50   60

[1] Recalculated by us using B($J/\psi(1S) \to \ell^+\ell^-$) = 0.1181 ± 0.0020.
[2] Recalculated by us using B($J/\psi(1S) \to \mu^+\mu^-$) = 0.0588 ± 0.0010.
[3] Not independent from other measurements of MENDEZ 08.
[4] Not independent from other values reported by ADAM 05A.

$\Gamma(J/\psi(1S)\eta)/\Gamma_{\text{total}}$ (units 10^{-3})

$\Gamma(J/\psi(1S)\eta)/\Gamma(J/\psi(1S)\text{anything})$ Γ_{14}/Γ_{10}

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
0.0549±0.0008 OUR FIT				
0.058 ±0.007 OUR AVERAGE				Error includes scale factor of 1.4. See the ideogram below.
0.050 ±0.006 ±0.003	298 ± 20	ANDREOTTI 05	E835	$\psi(2S) \to J/\psi X$
0.072 ±0.009		AMBROGIANI 00A	E835	$p\overline{p} \to \psi(2S)$
0.061 ±0.015		ARMSTRONG 97	E760	$\overline{p}p \to \psi(2S)$

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

0.0549±0.0006±0.0009	18.4k	[1] MENDEZ 08	CLEO	$\psi(2S) \to \ell^+\ell^-\eta$
0.0546±0.0010±0.0007	2.8k	ADAM 05A	CLEO	Repl. by MENDEZ 08

WEIGHTED AVERAGE
0.058±0.007 (Error scaled by 1.4)

Values above of weighted average, error, and scale factor are based upon the data in this ideogram only. They are not necessarily the same as our 'best' values, obtained from a least-squares constrained fit utilizing measurements of other (related) quantities as additional information.

			χ^2
ANDREOTTI	05	E835	1.5
AMBROGIANI	00A	E835	2.3
ARMSTRONG	97	E760	0.0
			3.9

(Confidence Level = 0.144)
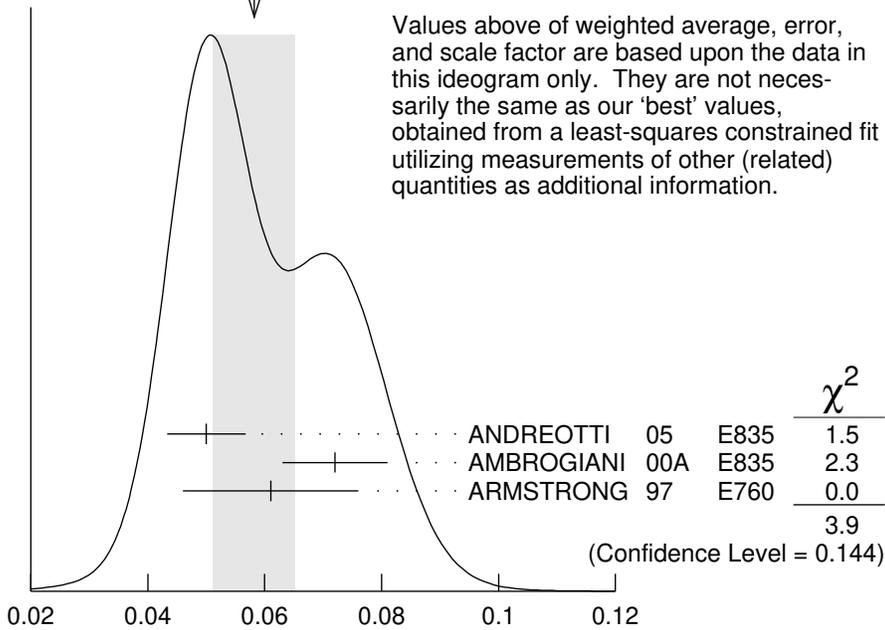
[1] Not independent from other measurements of MENDEZ 08.
$\Gamma(J/\psi(1S)\eta)/\Gamma(J/\psi(1S)\,\text{anything})$

$\Gamma(J/\psi(1S)\eta)/\Gamma(J/\psi(1S)\pi^+\pi^-)$ Γ_{14}/Γ_{12}

VALUE	EVTS		DOCUMENT ID		TECN	COMMENT
0.0972±0.0014 OUR FIT						
0.0979±0.0018 OUR AVERAGE						
0.0979±0.0010±0.0015	18.4k		MENDEZ	08	CLEO	$\psi(2S) \to \ell^+\ell^-\eta$
0.098 ±0.005 ±0.010	2k	[1] ABLIKIM		04B	BES	$\psi(2S) \to J/\psi X$
0.091 ±0.021		[2] HIMEL		80	MRK2	$e^+e^- \to \psi(2S)X$

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

0.0968±0.0019±0.0013	2.8k	[3] ADAM		05A	CLEO	Repl. by MENDEZ 08
0.095 ±0.007 ±0.007		[4] ANDREOTTI		05	E835	$\psi(2S) \to J/\psi X$

[1] From a fit to the J/ψ recoil mass spectra.
[2] The value for B($\psi(2S) \to J/\psi(1s)\eta$) reported in HIMEL 80 is derived using B($\psi(2S)) \to J/\psi(1S)\pi^+\pi^-$) = (33±3))% and B($J/\psi(1S) \to \ell^+\ell^-$) = 0.138±0.018. Calculated by us using B($J/\psi(1S) \to \ell^+\ell^-$) = (0.1181 ± 0.0020).
[3] Not independent from other values reported by ADAM 05A.
[4] Not independent from other values reported by ANDREOTTI 05.

$\Gamma(J/\psi(1S)\pi^0)/\Gamma_{total}$ Γ_{15}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
12.68±0.32 OUR AVERAGE					
12.6 ±0.2 ±0.3	4.1k	ABLIKIM	12M	BES3	$e^+e^- \to \ell^+\ell^- 2\gamma$
13.3 ±0.8 ±0.3	530	MENDEZ	08	CLEO	$\psi(2S) \to \ell^+\ell^- 2\gamma$
14.3 ±1.4 ±1.2	280	BAI	04I	BES2	$\psi(2S) \to J/\psi\gamma\gamma$
14 ±6	7	HIMEL	80	MRK2	e^+e^-
9 ±2 ±1	23	[1] OREGLIA	80	CBAL	$\psi(2S) \to J/\psi 2\gamma$

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

13	±1	±1	88	ADAM	05A CLEO	Repl. by MENDEZ 08

[1] Recalculated by us using $B(J/\psi(1S) \to \ell^+\ell^-) = 0.1181 \pm 0.0020$.

$\Gamma(J/\psi(1S)\pi^0)/\Gamma(J/\psi(1S)\text{anything})$

$$\Gamma_{15}/\Gamma_{10} = \Gamma_{15}/(\Gamma_{12}+\Gamma_{13}+\Gamma_{14}+0.343\Gamma_{163}+0.190\Gamma_{164})$$

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$0.213\pm0.012\pm0.003$	527	[1] MENDEZ	08	CLEO	$e^+e^- \to J/\psi\gamma\gamma$
$0.22\ \pm0.02\ \pm0.01$		[2] ADAM	05A	CLEO	$e^+e^- \to \psi(2S) \to$ $J/\psi\gamma\gamma$

[1] Not independent from other values reported by MENDEZ 08. Supersedes ADAM 05A.
[2] Not independent from other values reported by ADAM 05A.

$\Gamma(J/\psi(1S)\pi^0)/\Gamma(J/\psi(1S)\pi^+\pi^-)$ $\qquad\qquad$ Γ_{15}/Γ_{12}

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$0.380\pm0.022\pm0.005$	527	[1] MENDEZ	08	CLEO	$e^+e^- \to J/\psi\gamma\gamma$
$0.39\ \pm0.04\ \pm0.01$		[2] ADAM	05A	CLEO	$e^+e^- \to \psi(2S) \to$ $J/\psi\gamma\gamma$

[1] Not independent from other values reported by MENDEZ 08. Supersedes ADAM 05A.
[2] Not independent from other values reported by ADAM 05A.

———— HADRONIC DECAYS ————

$\Gamma(\pi^+\pi^-)/\Gamma_{\text{total}}$ $\qquad\qquad$ Γ_{16}/Γ

VALUE (units 10^{-5})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
0.78±0.26 OUR AVERAGE						
$0.76\pm0.25\pm0.06$		30	[1] METREVELI	12		$\psi(2S) \to \pi^+\pi^-$
$8\ \pm5$			BRANDELIK	79C	DASP	e^+e^-
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<2.1	90		DOBBS	06A	CLEO	$e^+e^- \to \psi(2S)$
<5	90		FELDMAN	77	MRK1	e^+e^-

[1] Obtained by analyzing CLEO-c data but not authored by the CLEO Collaboration. Using $\psi(3770) \to \pi^+\pi^-$ for continuum subtraction.

$\Gamma(\pi^+\pi^-\pi^0)/\Gamma_{\text{total}}$ $\qquad\qquad$ Γ_{17}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
2.01±0.17 OUR AVERAGE Error includes scale factor of 1.7. See the ideogram below.					
$2.14\pm0.03^{+0.12}_{-0.11}$	7k	[1] ABLIKIM	12H	BES3	$e^+e^- \to \psi(2S)$
$1.81\pm0.18\pm0.19$	260 ± 19	[2] ABLIKIM	05J	BES2	$e^+e^- \to \psi(2S)$
$1.88^{+0.16}_{-0.15}\pm0.28$	194	ADAM	05	CLEO	$e^+e^- \to \psi(2S)$
0.85 ± 0.46	4	FRANKLIN	83	MRK2	$e^+e^- \to$ hadrons

[1] From $\psi(2S) \to \pi^+\pi^-\pi^0$ events directly. The quoted systematic error includes a contribution of 4% (added in quadrature) from the uncertainty on the number of $\psi(2S)$ events.
[2] From a PW analysis of $\psi(2S) \to \pi^+\pi^-\pi^0$.

WEIGHTED AVERAGE
2.01±0.17 (Error scaled by 1.7)

			χ^2
ABLIKIM	12H	BES3	1.2
ABLIKIM	05J	BES2	0.6
ADAM	05	CLEO	0.2
FRANKLIN	83	MRK2	6.4
			8.4

(Confidence Level = 0.038)
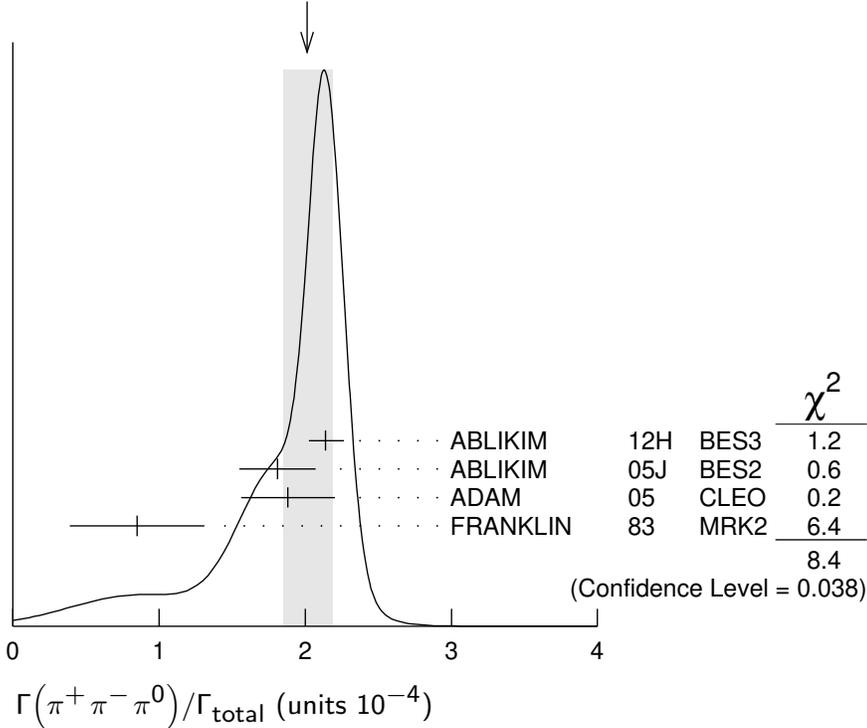
$\Gamma\left(\pi^+ \pi^- \pi^0\right)/\Gamma_{total}$ (units 10^{-4})

$\Gamma\left(\rho(770)\pi \to \pi^+ \pi^- \pi^0\right)/\Gamma_{total}$ Γ_{18}/Γ

VALUE (units 10^{-4})	*CL%*	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
0.32±0.12 OUR AVERAGE		Error includes scale factor of 1.8.				
$0.51\pm0.07\pm0.11$			[1] ABLIKIM	05J	BES2	$\psi(2S) \to \rho(770)\pi \to$ $\pi^+\pi^-\pi^0$
$0.24^{+0.08}_{-0.07}\pm0.02$		22	ADAM	05	CLEO	$e^+e^- \to \psi(2S)$

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

<0.83	90	1	FRANKLIN	83	MRK2	e^+e^-
<10	90		BARTEL	76	CNTR	e^+e^-
<10	90		[2] ABRAMS	75	MRK1	e^+e^-

[1] From a PW analysis of $\psi(2S) \to \pi^+\pi^-\pi^0$.
[2] Final state $\rho^0\pi^0$.

$\Gamma\left(\rho(2150)\pi \to \pi^+ \pi^- \pi^0\right)/\Gamma_{total}$ Γ_{19}/Γ

VALUE (units 10^{-4})		*DOCUMENT ID*		*TECN*	*COMMENT*
$\mathbf{1.94\pm0.25^{+1.15}_{-0.34}}$	[1]	ABLIKIM	05J	BES2	$\psi(2S) \to \rho(2150)\pi \to \pi^+\pi^-\pi^0$

[1] From a PW analysis of $\psi(2S) \to \pi^+\pi^-\pi^0$.

$\Gamma\left(2(\pi^+ \pi^-)\right)/\Gamma_{total}$ Γ_{20}/Γ

VALUE (units 10^{-4})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
2.4±0.6 OUR AVERAGE		Error includes scale factor of 2.2.			
$2.2\pm0.2\pm0.2$	308	BRIERE	05	CLEO	$e^+e^- \to \psi(2S) \to$ $2(\pi^+\pi^-)$
4.5 ± 1.0		TANENBAUM	78	MRK1	e^+e^-

$\Gamma(\rho^0 \pi^+ \pi^-)/\Gamma_{total}$ Γ_{21}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
2.2±0.6 OUR AVERAGE	Error includes scale factor of 1.4.				
2.0±0.2±0.4	285.5	BRIERE	05	CLEO	$e^+ e^- \to \psi(2S) \to$ $2(\pi^+ \pi^-)$
4.2±1.5		TANENBAUM	78	MRK1	$e^+ e^-$

$\Gamma(2(\pi^+ \pi^-)\pi^0)/\Gamma_{total}$ Γ_{22}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
29 ±10 OUR AVERAGE	Error includes scale factor of 4.7. See the ideogram below.				
24.9± 0.7±3.6	2173	ABLIKIM	07D	BES2	$e^+ e^- \to \psi(2S)$
127 ±12 ±2	410	[1] AUBERT	07AU	BABR	10.6 $e^+ e^- \to 2(\pi^+ \pi^-)\pi^0 \gamma$
26.1± 0.7±3.0	1703	BRIERE	05	CLEO	$e^+ e^- \to \psi(2S) \to$ $2(\pi^+ \pi^-)\pi^0$
30 ± 8	42	FRANKLIN	83	MRK2	$e^+ e^-$

WEIGHTED AVERAGE
29±10 (Error scaled by 4.7)

			χ^2
ABLIKIM	07D	BES2	1.4
AUBERT	07AU	BABR	63.2
BRIERE	05	CLEO	1.0
FRANKLIN	83	MRK2	0.0
			65.7

(Confidence Level < 0.0001)
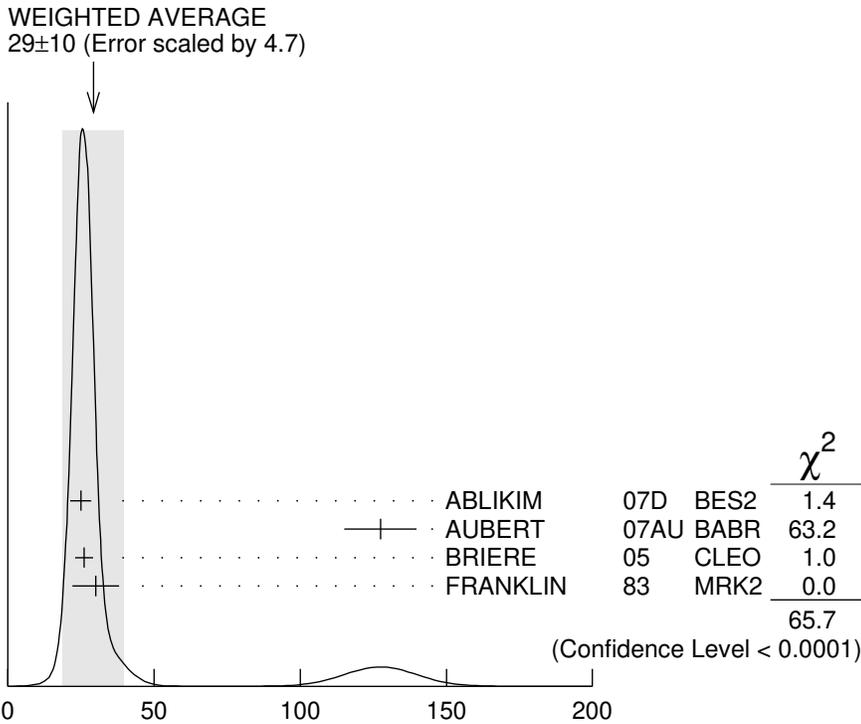
$\Gamma(2(\pi^+ \pi^-)\pi^0)/\Gamma_{total}$ (units 10^{-4})

[1] AUBERT 07AU reports $[\Gamma(\psi(2S) \to 2(\pi^+ \pi^-)\pi^0)/\Gamma_{total}] \times [\Gamma(\psi(2S) \to e^+ e^-)] = (297 \pm 22 \pm 18) \times 10^{-4}$ keV which we divide by our best value $\Gamma(\psi(2S) \to e^+ e^-) = 2.33 \pm 0.04$ keV. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\rho a_2(1320))/\Gamma_{total}$ Γ_{23}/Γ

VALUE (units 10^{-4})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
2.55±0.73±0.47		112 ± 31	BAI	04C	BES2	$\psi(2S) \to 2(\pi^+ \pi^-)\pi^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<2.3	90		BAI	98J	BES	$e^+ e^-$

$\Gamma\big(3(\pi^+\pi^-)\big)/\Gamma_{\text{total}}$ Γ_{27}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
3.5 $\pm$2.0 OUR AVERAGE		Error includes scale factor of 2.8.		
5.45$\pm$0.42$\pm$0.87	671	ABLIKIM 05H	BES2	$e^+e^- \to \psi(2S) \to$ $3(\pi^+\pi^-)$
1.5 $\pm$1.0		[1] TANENBAUM 78	MRK1	e^+e^-

[1] Assuming entirely strong decay.

$\Gamma\big(3(\pi^+\pi^-)\pi^0\big)/\Gamma_{\text{total}}$ Γ_{29}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
35$\pm$16	6	FRANKLIN 83	MRK2	$e^+e^- \to$ hadrons

$\Gamma\big(\eta\pi^+\pi^-\big)/\Gamma_{\text{total}}$ Γ_{31}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID	TECN	COMMENT
<1.6	90	BRIERE 05	CLEO	$e^+e^- \to \psi(2S) \to$ $2(\pi^+\pi^-)\pi^0$

$\Gamma\big(\eta\pi^+\pi^-\pi^0\big)/\Gamma_{\text{total}}$ Γ_{32}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
9.5$\pm$0.7$\pm$1.5		[1] BRIERE 05	CLEO	$e^+e^- \to \psi(2S) \to$ hadr
• • • We do not use the following data for averages, fits, limits, etc. • • •				
10.3$\pm$0.8$\pm$1.4	201.7	[2] BRIERE 05	CLEO	$e^+e^- \to \psi(2S) \to$ $\eta 3\pi (\eta \to \gamma\gamma)$
8.1$\pm$1.4$\pm$1.6	50.0	[2] BRIERE 05	CLEO	$e^+e^- \to \psi(2S) \to$ $\eta 3\pi (\eta \to 3\pi)$

[1] Average of $\eta \to \gamma\gamma$ and $\eta \to 3\pi$.
[2] Not independent from other values reported by BRIERE 05.

$\Gamma\big(\rho\eta\big)/\Gamma_{\text{total}}$ Γ_{37}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT
2.2 $\pm$0.6 OUR AVERAGE		Error includes scale factor of 1.1.		
3.0 $^{+1.1}_{-0.9}\pm$0.2	18	ADAM 05	CLEO	$e^+e^- \to \psi(2S)$
1.78$^{+0.67}_{-0.62}\pm$0.17	13	ABLIKIM 04L	BES	$e^+e^- \to \psi(2S)$

$\Gamma\big(\eta'\pi^+\pi^-\pi^0\big)/\Gamma_{\text{total}}$ Γ_{38}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
4.5$\pm$1.6$\pm$1.3	12.8	BRIERE 05	CLEO	$e^+e^- \to \psi(2S) \to$ hadr

$\Gamma\big(\eta'\rho\big)/\Gamma_{\text{total}}$ Γ_{39}/Γ

| VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT
1.87 $^{+1.64}_{-1.11}\pm$0.33	2	ABLIKIM 04L	BES	$e^+e^- \to \psi(2S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1.02 $\pm$0.11 $\pm$0.24	143	[1] ABLIKIM 17AK	BES3	$e^+e^- \to \psi(2S)$

$0.569 \pm 0.128 \pm 0.236$	80	[2] ABLIKIM	17AK BES3	$e^+e^- \to \psi(2S)$

[1] Destructive-interference solution of a partial wave analysis of the decay $\psi(2S) \to \pi^+\pi^-\eta'$.

[2] Constructive-interference solution of a partial wave analysis of the decay $\psi(2S) \to \pi^+\pi^-\eta'$.

$\Gamma(\omega\pi^0)/\Gamma_{total}$ $\qquad$ Γ_{40}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT
2.1 ±0.6 OUR AVERAGE				
$2.5 \begin{smallmatrix}+1.2\\-1.0\end{smallmatrix} \pm 0.2$	14	ADAM	05 CLEO	$e^+e^- \to \psi(2S)$
$1.87 \begin{smallmatrix}+0.68\\-0.62\end{smallmatrix} \pm 0.28$	14	ABLIKIM	04L BES	$e^+e^- \to \psi(2S)$

$\Gamma(\omega\pi^+\pi^-)/\Gamma_{total}$ $\qquad$ Γ_{41}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
7.3±1.2 OUR AVERAGE		Error includes scale factor of 2.1. See the ideogram below.		
$8.4 \pm 0.5 \pm 1.2$	386	ABLIKIM	07D BES2	$e^+e^- \to \psi(2S)$
$12.2 \pm 2.2 \pm 0.7$	37	[1] AUBERT	07AU BABR	$10.6\ e^+e^- \to \omega\pi^+\pi^-\gamma$
$8.2 \pm 0.5 \pm 0.7$	391	BRIERE	05 CLEO	$e^+e^- \to \psi(2S) \to 2(\pi^+\pi^-)\pi^0$
$4.8 \pm 0.6 \pm 0.7$	100 ± 22	[2] BAI	03B BES	$\psi(2S) \to 2(\pi^+\pi^-)\pi^0$

WEIGHTED AVERAGE
7.3±1.2 (Error scaled by 2.1)

			χ^2
ABLIKIM	07D	BES2	0.8
AUBERT	07AU	BABR	4.6
BRIERE	05	CLEO	1.2
BAI	03B	BES	7.1
			13.7

(Confidence Level = 0.0034)
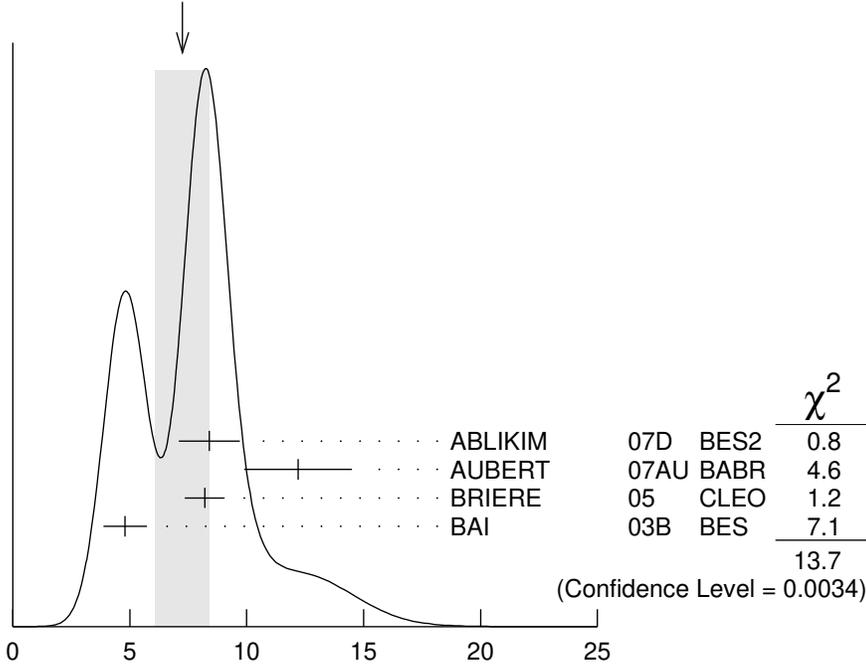
[1] AUBERT 07AU quotes $\Gamma_{ee}^{\psi(2S)} \cdot B(\psi(2S) \to \omega\pi^+\pi^-) \cdot B(\omega \to 3\pi) = 2.69 \pm 0.73 \pm 0.16$ eV.

[2] Normalized to $B(\psi(2S) \to J/\psi\pi^+\pi^-) = 0.305 \pm 0.016$.

$\Gamma(\omega\pi^+\pi^-)/\Gamma_{total}$ (units 10^{-4})

$\Gamma(b_1^\pm \pi^\mp)/\Gamma_{total}$ Γ_{43}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
4.0 ±0.6 OUR AVERAGE	Error includes scale factor of 1.1.				
5.1 ±0.6 ±0.8	202	ABLIKIM	07D	BES2	$e^+ e^- \to \psi(2S)$
$4.18^{+0.43}_{-0.42}$±0.92	170	ADAM	05	CLEO	$e^+ e^- \to \psi(2S)$
3.2 ±0.6 ±0.5	61 ± 11	[1,2] BAI	03B	BES	$\psi(2S) \to 2(\pi^+\pi^-)\pi^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
5.2 ±0.8 ±1.0		[1] BAI	99C	BES	Repl. by BAI 03B

[1] Assuming B$(b_1 \to \omega\pi)$=1.
[2] Normalized to B$(\psi(2S) \to J/\psi\pi^+\pi^-) = 0.305 \pm 0.016$.

$\Gamma(\omega f_2(1270))/\Gamma_{total}$ Γ_{44}/Γ

VALUE (units 10^{-4})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
2.2 ±0.4 OUR AVERAGE						
2.3 ±0.5 ±0.4		57	ABLIKIM	07D	BES2	$e^+ e^- \to \psi(2S)$
2.05±0.41±0.38		62±12	BAI	04C	BES2	$\psi(2S) \to 2(\pi^+\pi^-)\pi^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<1.5	90		[1] BAI	03B	BES	$\psi(2S) \to 2(\pi^+\pi^-)\pi^0$
<1.7	90		BAI	98J	BES	Repl. by BAI 03B

[1] Normalized to B$(\psi(2S) \to J/\psi\pi^+\pi^-) = 0.305 \pm 0.016$.

$\Gamma(b_1^0 \pi^0)/\Gamma_{total}$ Γ_{47}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
$2.35^{+0.47}_{-0.42}$±0.40	45	ADAM	05	CLEO	$e^+ e^- \to \psi(2S)$

$\Gamma(\omega\eta)/\Gamma_{total}$ Γ_{48}/Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID		TECN	COMMENT
<1.1	90	ADAM	05	CLEO	$e^+ e^- \to \psi(2S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<3.1	90	ABLIKIM	04K	BES	$e^+ e^- \to \psi(2S)$

$\Gamma(\omega\eta')/\Gamma_{total}$ Γ_{49}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
$3.2^{+2.4}_{-2.0}$±0.7	4	[1] ABLIKIM	04K	BES	$e^+ e^- \to \psi(2S)$

[1] Calculated combining $\eta' \to \gamma\rho$ and $\eta\pi^+\pi^-$ channels.

$\Gamma(\phi\pi^0)/\Gamma_{total}$ Γ_{50}/Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID		TECN	COMMENT
<0.04	90	ABLIKIM	12L	BES3	$e^+ e^- \to \psi(2S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.7	90	ADAM	05	CLEO	$e^+ e^- \to \psi(2S)$
<0.4	90	ABLIKIM	04K	BES	$e^+ e^- \to \psi(2S)$

$\Gamma\left(\phi\pi^+\pi^-\right)/\Gamma_{\text{total}}$ $\qquad$ Γ_{51}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
1.18±0.26 OUR AVERAGE		Error includes scale factor of 1.5. See the ideogram below.			
2.3 ±0.8 ±0.1	19 ± 6	LEES	12F	BABR	10.6 $e^+e^- \rightarrow$ $\pi^+\pi^- K^+ K^- \gamma$
0.9 ±0.2 ±0.1	47.6	BRIERE	05	CLEO	$e^+e^- \rightarrow \psi(2S) \rightarrow$ $K^+ K^- \pi^+\pi^-$
1.5 ±0.2 ±0.2	51.5 ± 8.3	[1] BAI	03B	BES	$\psi(2S) \rightarrow K^+ K^- \pi^+\pi^-$

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

2.45±0.96±0.04	10 ± 4	[2,3] AUBERT	07AK	BABR	10.6 $e^+e^- \rightarrow$ $\pi^+\pi^- K^+ K^- \gamma$

WEIGHTED AVERAGE
1.18±0.26 (Error scaled by 1.5)

			χ^2
LEES	12F	BABR	1.9
BRIERE	05	CLEO	1.6
BAI	03B	BES	1.2
			4.8

(Confidence Level = 0.092)
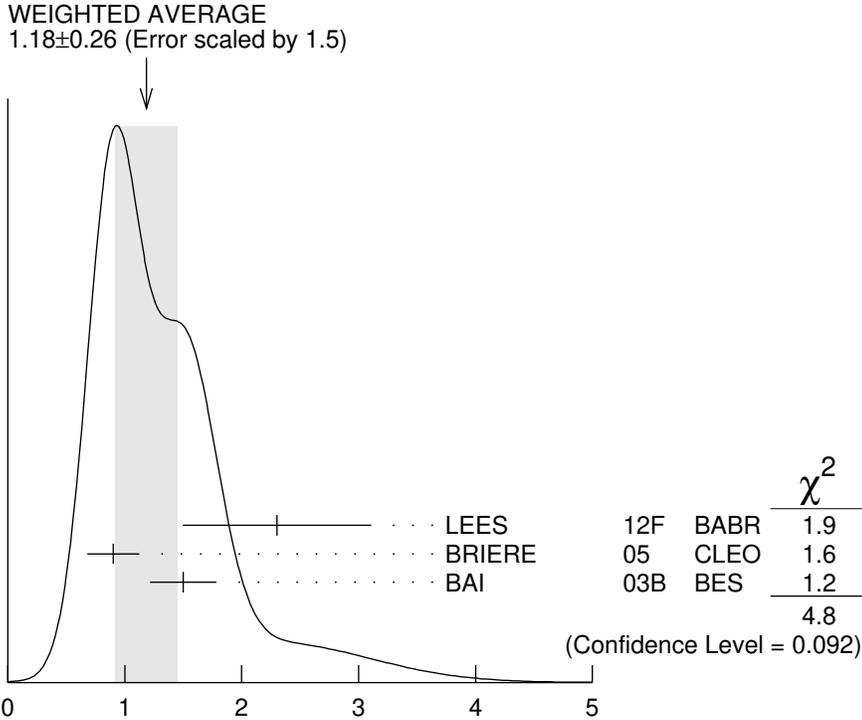
[1] Normalized to B($\psi(2S) \rightarrow J/\psi\pi^+\pi^-$) = 0.305 ± 0.016.

[2] Superseded by LEES 12F. AUBERT 07AK reports [$\Gamma(\psi(2S) \rightarrow \phi\pi^+\pi^-)/\Gamma_{\text{total}}$] × [$\Gamma(\psi(2S) \rightarrow e^+e^-)$] = $(0.57 \pm 0.22 \pm 0.04) \times 10^{-3}$ keV which we divide by our best value $\Gamma(\psi(2S) \rightarrow e^+e^-)$ = 2.33 ± 0.04 keV. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[3] Using B($\phi \rightarrow K^+ K^-$) = (49.3 ± 0.6)%.

$\Gamma\left(\phi\pi^+\pi^-\right)/\Gamma_{\text{total}}$ (units 10^{-4})

$\Gamma\left(\phi f_0(980) \rightarrow \pi^+\pi^-\right)/\Gamma_{\text{total}}$ $\qquad$ Γ_{52}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
0.75±0.33 OUR AVERAGE		Error includes scale factor of 1.6.			
1.5 ±0.5 ±0.1	12 ± 4	LEES	12F	BABR	10.6 $e^+e^- \rightarrow$ $\pi^+\pi^- K^+ K^- \gamma$
0.6 ±0.2 ±0.1	18.4 ± 6.4	[1] BAI	03B	BES	$\psi(2S) \rightarrow K^+ K^- \pi^+\pi^-$

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

$1.46 \pm 0.71 \pm 0.02$	6 ± 3	[2,3] AUBERT	07AK BABR	10.6	$e^+ e^- \to \pi^+ \pi^- K^+ K^- \gamma$

[1] Normalized to B$(\psi(2S) \to J/\psi \pi^+ \pi^-) = 0.305 \pm 0.016$.

[2] Superseded by LEES 12F. AUBERT 07AK reports $[\Gamma(\psi(2S) \to \phi f_0(980) \to \pi^+ \pi^-)/\Gamma_{total}] \times [\Gamma(\psi(2S) \to e^+ e^-)] = (0.34 \pm 0.16 \pm 0.04) \times 10^{-3}$ keV which we divide by our best value $\Gamma(\psi(2S) \to e^+ e^-) = 2.33 \pm 0.04$ keV. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[3] Using B$(\phi \to K^+ K^-) = (49.3 \pm 0.6)\%$.

$\Gamma(\phi\eta)/\Gamma_{total}$ Γ_{53}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
3.10±0.31 OUR AVERAGE					
$3.14 \pm 0.23 \pm 0.23$	0.2k	ABLIKIM	12L	BES3	$e^+ e^- \to \psi(2S)$
$2.0 \,^{+1.5}_{-1.1} \pm 0.4$	6	ADAM	05	CLEO	$e^+ e^- \to \psi(2S)$
$3.3 \pm 1.1 \pm 0.5$	17	ABLIKIM	04K	BES	$e^+ e^- \to \psi(2S)$

$\Gamma(\eta\phi(2170), \phi(2170) \to \phi f_0(980), f_0 \to \pi^+\pi^-)/\Gamma_{total}$ Γ_{54}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<2.2 \times 10^{-6}$	90	ABLIKIM	19I	BES3	$e^+ e^- \to \eta\phi f_0(980)$

$\Gamma(\phi\eta')/\Gamma_{total}$ Γ_{55}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
1.54±0.20 OUR AVERAGE					
$1.51 \pm 0.16 \pm 0.12$	201	ABLIKIM	19BA BES3		$e^+ e^- \to \psi(2S)$
$3.1 \pm 1.4 \pm 0.7$	8	[1] ABLIKIM	04K	BES	$e^+ e^- \to \psi(2S)$

[1] Calculated combining $\eta' \to \gamma\rho$ and $\eta\pi^+\pi^-$ channels.

$\Gamma(\phi f_1(1285))/\Gamma_{total}$ Γ_{56}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
3.0±0.4±1.3	234	[1] ABLIKIM	19BA BES3		$e^+ e^- \to \psi(2S)$

[1] ABLIKIM 19BA reports $[\Gamma(\psi(2S) \to \phi f_1(1285))/\Gamma_{total}] \times [B(f_1(1285) \to \eta\pi^+\pi^-)] = (1.03 \pm 0.10 \pm 0.09) \times 10^{-5}$ which we divide by our best value B$(f_1(1285) \to \eta\pi^+\pi^-) = (35 \pm 15) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\phi\eta(1405) \to \phi\pi^+\pi^-\eta)/\Gamma_{total}$ Γ_{57}/Γ

VALUE (units 10^{-6})	EVTS	DOCUMENT ID		TECN	COMMENT
8.46±1.37±0.92	195	ABLIKIM	19BA BES3		$e^+ e^- \to \psi(2S)$

$\Gamma(\phi f_2'(1525))/\Gamma_{total}$ Γ_{58}/Γ

VALUE (units 10^{-4})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
0.44±0.12±0.11		20 ± 6	BAI	04C		$\psi(2S) \to 2(K^+ K^-)$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<0.45	90		BAI	98J	BES	$e^+ e^- \to 2(K^+ K^-)$

$\Gamma(K^+ K^-)/\Gamma_{total}$ $\qquad\qquad$ Γ_{59}/Γ

VALUE (units 10^{-5})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
7.48±0.23±0.39		1.3k	[1] METREVELI	12		$\psi(2S) \to K^+ K^-$

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

6.2 ±1.5 ±0.2		66	[2,3] LEES	15J	BABR	$e^+ e^- \to K^+ K^- \gamma$
8.3 ±1.5 ±0.2		66	[3,4] LEES	15J	BABR	$e^+ e^- \to K^+ K^- \gamma$
6.3 ±0.6 ±0.3			[5] DOBBS	06A	CLEO	$e^+ e^-$
10 ±7			[5] BRANDELIK	79C	DASP	$e^+ e^-$
< 5	90		FELDMAN	77	MRK1	$e^+ e^-$

[1] Obtained by analyzing CLEO-c data but not authored by the CLEO Collaboration.
[2] $\sin\phi > 0$.
[3] Using $\Gamma(\psi(2S) \to e^+ e^-) = (2.37 \pm 0.04)$ keV.
[4] $\sin\phi < 0$.
[5] Interference with non-resonant $K^+ K^-$ production not taken into account.

$\Gamma(K^+ K^- \pi^+)/\Gamma_{total}$ $\qquad\qquad$ Γ_{60}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
7.3±0.5 OUR AVERAGE					
8.1±1.3±0.3	133	LEES	12F	BABR	$10.6 \; e^+ e^- \to$ $\pi^+ \pi^- K^+ K^- \gamma$
7.1±0.3±0.4	817.2	BRIERE	05	CLEO	$e^+ e^- \to \psi(2S) \to$ $K^+ K^- \pi^+ \pi^-$
16 ±4		[1] TANENBAUM	78	MRK1	$e^+ e^-$

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

11.0±1.9±0.2	85	[2] AUBERT	07AK	BABR	$10.6 \; e^+ e^- \to$ $\pi^+ \pi^- K^+ K^- \gamma$

[1] Assuming entirely strong decay.
[2] Superseded by LEES 12F. AUBERT 07AK reports $[\Gamma(\psi(2S) \to K^+ K^- \pi^+)/\Gamma_{total}] \times [\Gamma(\psi(2S) \to e^+ e^-)] = (2.56 \pm 0.42 \pm 0.16) \times 10^{-3}$ keV which we divide by our best value $\Gamma(\psi(2S) \to e^+ e^-) = 2.33 \pm 0.04$ keV. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(K^+ K^- \pi^0)/\Gamma_{total}$ $\qquad\qquad$ Γ_{61}/Γ

VALUE (units 10^{-5})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
4.07±0.16±0.26		0.9k	ABLIKIM	12L	BES3	$e^+ e^- \to \psi(2S)$

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

<8.9	90	1	FRANKLIN	83	MRK2	$e^+ e^- \to$ hadrons

$\Gamma(K^0_S K^0_S)/\Gamma_{total}$ $\qquad\qquad$ Γ_{62}/Γ

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
<0.046	[1] BAI	04D	BES	$e^+ e^-$

[1] Forbidden by *CP*.

$\Gamma(K^0_S K^0_L)/\Gamma_{total}$ Γ_{63}/Γ

VALUE (units 10^{-5})	EVTS		DOCUMENT ID		TECN	COMMENT
5.34±0.33 OUR AVERAGE						
5.28±0.25±0.34	478 ± 23	[1]	METREVELI	12		$\psi(2S) \to K^0_S K^0_L$
5.8 ±0.8 ±0.4			DOBBS	06A	CLEO	$e^+ e^-$
5.24±0.47±0.48	156 ± 14	[2]	BAI	04B	BES2	$\psi(2S) \to K^0_S K^0_L \to$ $\pi^+ \pi^- X$

[1] Obtained by analyzing CLEO-c data but not authored by the CLEO Collaboration.
[2] Using B$(K^0_S \to \pi^+ \pi^-) = 0.6860 \pm 0.0027$.

$\Gamma(K^+ K^- \pi^+ \pi^- \pi^0)/\Gamma_{total}$ Γ_{66}/Γ

VALUE (units 10^{-4})	EVTS		DOCUMENT ID		TECN	COMMENT
12.6±0.9 OUR AVERAGE						
18.9±5.7±0.3	32	[1]	AUBERT	07AU	BABR	10.6 $e^+ e^- \to$ $K^+ K^- \pi^+ \pi^- \pi^0 \gamma$
11.7±1.0±1.5	597		ABLIKIM	06G	BES2	$\psi(2S) \to K^+ K^- \pi^+ \pi^- \pi^0$
12.7±0.5±1.0	711.6		BRIERE	05	CLEO	$e^+ e^- \to \psi(2S) \to$ $K^+ K^- \pi^+ \pi^- \pi^0$

[1] AUBERT 07AU reports $[\Gamma(\psi(2S) \to K^+ K^- \pi^+ \pi^- \pi^0)/\Gamma_{total}] \times [\Gamma(\psi(2S) \to e^+ e^-)] = (44 \pm 13 \pm 3) \times 10^{-4}$ keV which we divide by our best value $\Gamma(\psi(2S) \to e^+ e^-) = 2.33 \pm 0.04$ keV. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\omega f_0(1710) \to \omega K^+ K^-)/\Gamma_{total}$ Γ_{67}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
5.9±2.0±0.9	19	ABLIKIM	06G	BES2	$\psi(2S) \to$ $K^+ K^- \pi^+ \pi^- \pi^0$

$\Gamma(K^*(892)^0 K^- \pi^+ \pi^0 + c.c.)/\Gamma_{total}$ Γ_{68}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
8.6±1.3±1.8	238	ABLIKIM	06G	BES2	$\psi(2S) \to$ $K^+ K^- \pi^+ \pi^- \pi^0$

$\Gamma(K^*(892)^+ K^- \pi^+ \pi^- + c.c.)/\Gamma_{total}$ Γ_{69}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
9.6±2.2±1.7	133	ABLIKIM	06G	BES2	$\psi(2S) \to$ $K^+ K^- \pi^+ \pi^- \pi^0$

$\Gamma(K^*(892)^+ K^- \rho^0 + c.c.)/\Gamma_{total}$ Γ_{70}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
7.3±2.2±1.4	78	ABLIKIM	06G	BES2	$\psi(2S) \to$ $K^+ K^- \pi^+ \pi^- \pi^0$

$\Gamma(K^*(892)^0 K^- \rho^+ + c.c.)/\Gamma_{total}$ Γ_{71}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
6.1±1.3±1.2	125	ABLIKIM	06G	BES2	$\psi(2S) \to$ $K^+ K^- \pi^+ \pi^- \pi^0$

$\Gamma(K^0_S K^0_S \pi^+ \pi^-)/\Gamma_{total}$ Γ_{72}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
2.20±0.25±0.37	83 ± 9	ABLIKIM	05O BES2	$e^+ e^- \to \psi(2S)$

$\Gamma(K^+ K^- \rho^0)/\Gamma_{total}$ Γ_{75}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
2.2±0.2±0.4	223.8	BRIERE	05 CLEO	$e^+ e^- \to \psi(2S) \to$ $K^+ K^- \pi^+ \pi^-$

$\Gamma(K^*(892)^0 \overline{K}^*_2(1430)^0)/\Gamma_{total}$ Γ_{76}/Γ

VALUE (units 10^{-4})	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
1.86±0.32±0.43		93 ± 16	BAI	04C	$\psi(2S) \to K^+ K^- \pi^+ \pi^-$

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

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
<1.2	90		BAI	98J BES	$e^+ e^-$

$\Gamma(K^+ K^- \pi^+ \pi^- \eta)/\Gamma_{total}$ Γ_{77}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
1.3±0.7±0.1	7	[1] AUBERT	07AU BABR	10.6 $e^+ e^- \to K^+ K^- \pi^+ \pi^- \eta \gamma$

[1] AUBERT 07AU quotes $\Gamma^{\psi(2S)}_{ee} \cdot B(\psi(2S) \to 2(\pi^+ \pi^-)\eta) \cdot B(\eta \to \gamma\gamma) = 1.2 \pm 0.7 \pm 0.1$ eV.

$\Gamma(K^+ K^- 2(\pi^+ \pi^-)\pi^0)/\Gamma_{total}$ Γ_{79}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
10.0±2.5±1.8	65	ABLIKIM	07D BES2	$e^+ e^- \to \psi(2S)$

$\Gamma(K^+ K^*(892)^- + c.c.)/\Gamma_{total}$ Γ_{80}/Γ

VALUE (units 10^{-5})	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
2.9 ±0.4 OUR AVERAGE			Error includes scale factor of 1.2.		
$3.18 \pm 0.30^{+0.26}_{-0.31}$		0.2k	ABLIKIM	12L BES3	$e^+ e^- \to \psi(2S)$
$2.9^{+1.3}_{-1.7} \pm 0.4$		9.6 ± 4.2	ABLIKIM	05I BES2	$e^+ e^- \to \psi(2S)$
$1.3^{+1.0}_{-0.7} \pm 0.3$		7	ADAM	05 CLEO	$e^+ e^- \to \psi(2S)$

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

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
<5.4	90		FRANKLIN	83 MRK2	$e^+ e^- \to$ hadrons

$\Gamma(2(K^+ K^-))/\Gamma_{total}$ Γ_{81}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
0.63±0.13 OUR AVERAGE				
0.9 ±0.4 ±0.1	13	LEES	12F BABR	10.6 $e^+ e^- \to$ $2(K^+ K^-)\gamma$
0.6 ±0.1 ±0.1	59.2	BRIERE	05 CLEO	$e^+ e^- \to \psi(2S) \to$ $2(K^+ K^-)$

$\Gamma(2(K^+ K^-)\pi^0)/\Gamma_{total}$ Γ_{82}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
1.1±0.2±0.2	44.7	BRIERE	05 CLEO	$e^+ e^- \to \psi(2S) \to$ $2(K^+ K^-)\pi^0$

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

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
0.70±0.16 OUR AVERAGE					
0.8 ±0.2 ±0.1	36.8	BRIERE	05	CLEO	$e^+ e^- \to \psi(2S) \to$ $2(K^+ K^-)$
0.6 ±0.2 ±0.1	16.1 ± 5.0	[1] BAI	03B	BES	$\psi(2S) \to 2(K^+ K^-)$

[1] Normalized to B($\psi(2S) \to J/\psi \pi^+ \pi^-$) = 0.305 ± 0.016.

$\Gamma(K_1(1270)^\pm K^\mp)/\Gamma_{total}$ Γ_{84}/Γ

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
10.0±1.8±2.1	[1] BAI	99C	BES	$e^+ e^-$

[1] Assuming B($K_1(1270) \to K\rho$)=0.42 ± 0.06

$\Gamma(K^+ \overline{K}^*(892)^0 \pi^- + c.c.)/\Gamma_{total}$ Γ_{85}/Γ

VALUE (units 10^{-4})	DOCUMENT ID	TECN	COMMENT
6.7±2.5	TANENBAUM 78	MRK1	$e^+ e^-$

$\Gamma(\eta K^+ K^-, \text{no } \eta\phi)/\Gamma_{total}$ Γ_{86}/Γ

VALUE (units 10^{-5})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
3.49±0.09±0.15		1.8k	[1] ABLIKIM	20F	BES3	$\psi(2S) \to K^+ K^- \gamma\gamma$

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

3.08±0.29±0.25		0.3k	[1,2] ABLIKIM	12L	BES3	$\psi(2S) \to K^+ K^- \gamma\gamma$
<13	90		BRIERE	05	CLEO	$e^+ e^- \to \psi(2S) \to$ $K^+ K^- \pi^+ \pi^- \pi^0$

[1] Excluding $\eta\phi$.
[2] Superseded by ABLIKIM 20F.

$\Gamma(X(1750)\eta \to K^+ K^- \eta)/\Gamma_{total}$ Γ_{87}/Γ

VALUE (units 10^{-6})	DOCUMENT ID		TECN	COMMENT
4.8±1.0±2.6	ABLIKIM	20F	BES3	$\psi(2S) \to K^+ K^- \eta$

$\Gamma(K_1(1400)^\pm K^\mp)/\Gamma_{total}$ Γ_{88}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<3.1	90	[1] BAI	99C	BES	$e^+ e^-$

[1] Assuming B($K_1(1400) \to K^*\pi$)=0.94 ± 0.06

$\Gamma(K_2^*(1430)^\pm K^\mp)/\Gamma_{total}$ Γ_{89}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
7.12±0.62$^{+1.13}_{-0.61}$	251 ± 22	ABLIKIM	12L	BES3	$e^+ e^- \to \psi(2S)$

$\Gamma(K^*(892)^0 \overline{K}^0 + c.c.)/\Gamma_{total}$ Γ_{90}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
10.9±2.0 OUR AVERAGE					
13.3$^{+2.4}_{-2.8}$±1.7	65.6 ± 9.0	ABLIKIM	05I	BES2	$e^+ e^- \to \psi(2S)$
9.2$^{+2.7}_{-2.2}$±0.9	25	ADAM	05	CLEO	$e^+ e^- \to \psi(2S)$

$\Gamma(K^+ K^*(892)^- + \text{c.c.})/\Gamma(K^*(892)^0 \overline{K}{}^0 + \text{c.c.})$ Γ_{80}/Γ_{90}

VALUE	DOCUMENT ID		TECN	COMMENT
0.16±0.06 OUR AVERAGE				
$0.22^{+0.10}_{-0.14}$	ABLIKIM	05I	BES2	$e^+ e^- \to \psi(2S)$
$0.14^{+0.08}_{-0.06}$	ADAM	05	CLEO	$e^+ e^- \to \psi(2S)$

$\Gamma(\omega K^+ K^-)/\Gamma_{\text{total}}$ Γ_{91}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
1.62±0.11 OUR AVERAGE		Error includes scale factor of 1.1.			
$1.56\pm0.04\pm0.11$	2.8k	ABLIKIM	14G	BES3	$\psi(2S) \to K^+ K^- \pi^+ \pi^- \pi^0$
$2.38\pm0.37\pm0.29$	78	ABLIKIM	06G	BES2	$\psi(2S) \to K^+ K^- \pi^+ \pi^- \pi^0$
$1.9 \pm0.3 \pm0.3$	76.8	BRIERE	05	CLEO	$e^+ e^- \to \psi(2S) \to$ $K^+ K^- \pi^+ \pi^- \pi^0$
$1.5 \pm0.3 \pm0.2$	23	[1] BAI	03B	BES	$\psi(2S) \to K^+ K^- \pi^+ \pi^- \pi^0$

[1] Normalized to $\text{B}(\psi(2S) \to J/\psi \pi^+ \pi^-) = 0.305 \pm 0.016$.

$\Gamma(\omega K^0_S K^0_S)/\Gamma_{\text{total}}$ Γ_{92}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
7.04±0.39±0.36	1.5k	ABLIKIM	21AL	BES3	$\psi(2S) \to \pi^+ \pi^- \pi^0 K^0_S K^0_S$

$\Gamma(\omega K^*(892)^+ K^- + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{93}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
20.7±2.6 OUR AVERAGE					
$18.9\pm2.9\pm2.2$	396	ABLIKIM	13M	BES3	$\psi(2S) \to \omega K^0_S K^- \pi^+$
$22.6\pm3.0\pm2.4$	535	ABLIKIM	13M	BES3	$\psi(2S) \to \omega K^+ K^- \pi^0$

$\Gamma(\omega K^*_2(1430)^+ K^- + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{94}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
6.1 ±1.2 OUR AVERAGE					
$6.39\pm1.50\pm0.78$	128	ABLIKIM	13M	BES3	$\psi(2S) \to \omega K^0_S K^- \pi^+$
$5.86\pm1.61\pm0.83$	143	ABLIKIM	13M	BES3	$\psi(2S) \to \omega K^+ K^- \pi^0$

$\Gamma(\omega \overline{K}{}^*(892)^0 K^0)/\Gamma_{\text{total}}$ Γ_{95}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
16.8±2.5±1.6	356	ABLIKIM	13M	BES3	$\psi(2S) \to \omega K^0_S K^- \pi^+$

$\Gamma(\omega \overline{K}{}^*_2(1430)^0 K^0)/\Gamma_{\text{total}}$ Γ_{96}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
5.82±2.08±0.72	116	ABLIKIM	13M	BES3	$\psi(2S) \to \omega K^0_S K^- \pi^+$

$\Gamma(\omega X(1440) \to \omega K^0_S K^- \pi^+ + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{97}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
1.60±0.27±0.24	109	[1] ABLIKIM	13M	BES3	$\psi(2S) \to \omega K^0_S K^- \pi^+$

[1] $X(1440)$ compatible with $\eta(1405)$ and $\eta(1475)$. A $f_1(1420)$ is also possible.

$\Gamma\left(\omega X(1440) \to \omega K^+ K^- \pi^0\right)/\Gamma_{total}$ Γ_{98}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
1.09±0.20±0.16	82	[1] ABLIKIM	13M	BES3	$\psi(2S) \to \omega K^+ K^- \pi^0$

[1] $X(1440)$ compatible with $\eta(1405)$ and $\eta(1475)$. A $f_1(1420)$ is also possible.

$\Gamma\left(\omega f_1(1285) \to \omega K_S^0 K^- \pi^+ + c.c.\right)/\Gamma_{total}$ Γ_{99}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
0.302±0.098±0.027	22	[1] ABLIKIM	13M	BES3	$\psi(2S) \to \omega K_S^0 K^- \pi^+$

[1] Statistical signficance 4.5 σ. This measurement is equivalent to a limit of $< 0.478 \times 10^{-5}$ at 90% C.L.

$\Gamma\left(\omega f_1(1285) \to \omega K^+ K^- \pi^0\right)/\Gamma_{total}$ Γ_{100}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
0.125±0.070±0.013	10	[1] ABLIKIM	13M	BES3	$\psi(2S) \to \omega K^+ K^- \pi^0$

[1] Statistical signficance 3.2 σ. This measurement is equivalent to a limit of $< 0.221 \times 10^{-5}$ at 90% C.L.

$\Gamma\left(p\overline{p}\right)/\Gamma_{total}$ Γ_{101}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
2.94±0.08 OUR FIT					
3.02±0.08 OUR AVERAGE					
3.05±0.02±0.12	19k	ABLIKIM	18T	BES3	$e^+ e^- \to \psi(2S) \to p\overline{p}$
3.08±0.05±0.18	4.5k	[1] DOBBS	14		$e^+ e^- \to \psi(2S) \to p\overline{p}$
3.36±0.09±0.25	1.6k	ABLIKIM	07C	BES	$e^+ e^- \to \psi(2S) \to p\overline{p}$
2.87±0.12±0.15	557	PEDLAR	05	CLEO	$e^+ e^- \to \psi(2S) \to p\overline{p}$
1.4 ±0.8	4	BRANDELIK	79C	DASP	$e^+ e^- \to \psi(2S) \to p\overline{p}$
2.3 ±0.7		FELDMAN	77	MRK1	$e^+ e^- \to \psi(2S) \to p\overline{p}$

[1] Using CLEO-c data but not authored by the CLEO Collaboration.

$\Gamma\left(p\overline{p}\right)/\Gamma\left(J/\psi(1S)\pi^+\pi^-\right)$ Γ_{101}/Γ_{12}

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
8.49±0.23 OUR FIT				
6.98±0.49±0.97	BAI	01	BES	$e^+ e^- \to \psi(2S) \to p\overline{p}$

$\Gamma\left(n\overline{n}\right)/\Gamma_{total}$ Γ_{102}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
3.06±0.06±0.14	6k	ABLIKIM	18T	BES3	$e^+ e^- \to \psi(2S) \to n\overline{n}$

$\Gamma\left(p\overline{p}\pi^0\right)/\Gamma_{total}$ Γ_{103}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
1.53±0.07 OUR AVERAGE					
1.65±0.03±0.15	4.5k	ABLIKIM	13A	BES3	$\psi(2S) \to p\overline{p}\pi^0$
1.54±0.06±0.06	948	ALEXANDER	10	CLEO	$\psi(2S) \to \pi^0 p\overline{p}$
1.32±0.10±0.15	256	[1] ABLIKIM	05E	BES2	$e^+ e^- \to \psi(2S) \to p\overline{p}\gamma\gamma$
1.4 ±0.5	9	FRANKLIN	83	MRK2	$e^+ e^-$

[1] Computed using B($\pi^0 \to \gamma\gamma$) = (98.80 ± 0.03)%.

$\Gamma\left(N(940)\overline{p}+ \text{c.c.} \to p\overline{p}\pi^0\right)/\Gamma_{\text{total}}$ $\qquad\qquad$ Γ_{104}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT
$6.42\pm0.20^{+1.78}_{-1.28}$	1.9k	[1] ABLIKIM	13A BES3	$\psi(2S) \to p\overline{p}\pi^0$

[1] From a fit of $\pi^0 p\overline{p}$ data to eight distinct intermediate $N\overline{p}$ resonant states.

$\Gamma\left(N(1440)\overline{p}+ \text{c.c.} \to p\overline{p}\pi^0\right)/\Gamma_{\text{total}}$ $\qquad\qquad$ Γ_{105}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT
$7.3^{+1.7}_{-1.5}$ **OUR AVERAGE** Error includes scale factor of 2.5.				
$3.58\pm0.25^{+1.59}_{-0.84}$	1.1k	[1] ABLIKIM	13A BES3	$\psi(2S) \to p\overline{p}\pi^0$
$8.1\pm0.7\pm0.3$	474	[2] ALEXANDER	10 CLEO	$\psi(2S) \to \pi^0 p\overline{p}$

[1] From a fit of $\pi^0 p\overline{p}$ data to eight distinct intermediate $N\overline{p}$ resonant states.
[2] From a fit of the $p\overline{p}$ and $p\pi^0$ mass distributions to a combination of $N(1440)\overline{p}$, a broad $p\overline{p}$ enhancement around 2100 MeV, and two other broad, unestablished resonances.

$\Gamma\left(N(1520)\overline{p}+ \text{c.c.} \to p\overline{p}\pi^0\right)/\Gamma_{\text{total}}$ $\qquad\qquad$ Γ_{106}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT
$0.64\pm0.05^{+0.22}_{-0.17}$	0.2k	[1] ABLIKIM	13A BES3	$\psi(2S) \to p\overline{p}\pi^0$

[1] From a fit of $\pi^0 p\overline{p}$ data to eight distinct intermediate $N\overline{p}$ resonant states.

$\Gamma\left(N(1535)\overline{p}+ \text{c.c.} \to p\overline{p}\pi^0\right)/\Gamma_{\text{total}}$ $\qquad\qquad$ Γ_{107}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT
$2.47\pm0.28^{+0.99}_{-0.97}$	0.7k	[1] ABLIKIM	13A BES3	$\psi(2S) \to p\overline{p}\pi^0$

[1] From a fit of $\pi^0 p\overline{p}$ data to eight distinct intermediate $N\overline{p}$ resonant states.

$\Gamma\left(N(1650)\overline{p}+ \text{c.c.} \to p\overline{p}\pi^0\right)/\Gamma_{\text{total}}$ $\qquad\qquad$ Γ_{108}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT
$3.76\pm0.28^{+1.37}_{-1.66}$	1.1k	[1] ABLIKIM	13A BES3	$\psi(2S) \to p\overline{p}\pi^0$

[1] From a fit of $\pi^0 p\overline{p}$ data to eight distinct intermediate $N\overline{p}$ resonant states.

$\Gamma\left(N(1720)\overline{p}+ \text{c.c.} \to p\overline{p}\pi^0\right)/\Gamma_{\text{total}}$ $\qquad\qquad$ Γ_{109}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT
$1.79\pm0.10^{+0.24}_{-0.71}$	0.5k	[1] ABLIKIM	13A BES3	$\psi(2S) \to p\overline{p}\pi^0$

[1] From a fit of $\pi^0 p\overline{p}$ data to eight distinct intermediate $N\overline{p}$ resonant states.

$\Gamma\left(N(2300)\overline{p}+ \text{c.c.} \to p\overline{p}\pi^0\right)/\Gamma_{\text{total}}$ $\qquad\qquad$ Γ_{110}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT
$2.62\pm0.28^{+1.12}_{-0.64}$	0.9k	[1] ABLIKIM	13A BES3	$\psi(2S) \to p\overline{p}\pi^0$

[1] From a fit of $\pi^0 p\overline{p}$ data to eight distinct intermediate $N\overline{p}$ resonant states.

$\Gamma\left(N(2570)\overline{p}+\text{c.c.}\rightarrow p\overline{p}\pi^0\right)/\Gamma_{\text{total}}$ $\qquad\qquad\Gamma_{111}/\Gamma$

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
$\mathbf{2.13\pm0.08^{+0.40}_{-0.30}}$	0.8k	[1] ABLIKIM	13A	BES3	$\psi(2S)\rightarrow p\overline{p}\pi^0$

[1] From a fit of $\pi^0 p\overline{p}$ data to eight distinct intermediate $N\overline{p}$ resonant states.

$\Gamma\left(p\overline{p}\pi^+\pi^-\right)/\Gamma_{\text{total}}$ $\qquad\qquad\Gamma_{112}/\Gamma$

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
6.0±0.4 OUR AVERAGE					
$5.9\pm0.2\pm0.4$	904.5	BRIERE	05	CLEO	$e^+e^-\rightarrow\psi(2S)\rightarrow$ $p\overline{p}\pi^+\pi^-$
$8\ \pm2$		[1] TANENBAUM	78	MRK1	e^+e^-

[1] Assuming entirely strong decay.

$\Gamma\left(p\overline{p}K^+K^-\right)/\Gamma_{\text{total}}$ $\qquad\qquad\Gamma_{113}/\Gamma$

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
$\mathbf{2.7\pm0.6\pm0.4}$	30.1	BRIERE	05	CLEO	$e^+e^-\rightarrow\psi(2S)\rightarrow$ $p\overline{p}K^+K^-$

$\Gamma\left(p\overline{p}\eta\right)/\Gamma_{\text{total}}$ $\qquad\qquad\Gamma_{114}/\Gamma$

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
6.0±0.4 OUR AVERAGE					
$6.4\pm0.2\pm0.6$	679	[1] ABLIKIM	13S	BES3	$\psi(2S)\rightarrow\eta p\overline{p}$
$5.6\pm0.6\pm0.3$	154	[1] ALEXANDER	10	CLEO	$\psi(2S)\rightarrow\eta p\overline{p}$
$5.8\pm1.1\pm0.7$	44.8 ± 8.5	[2] ABLIKIM	05E	BES2	$e^+e^-\rightarrow\psi(2S)\rightarrow$ $p\overline{p}\gamma\gamma$
$8\ \pm3\ \pm3$	9.8	BRIERE	05	CLEO	$e^+e^-\rightarrow\psi(2S)\rightarrow$ $p\overline{p}\pi^+\pi^-\pi^0$

[1] With $N(1535)$ decaying to $p\eta$.
[2] Computed using $B(\eta\rightarrow\gamma\gamma)=(39.43\pm0.26)\%$.

$\Gamma\left(N(1535)\overline{p}+\text{c.c.}\rightarrow p\overline{p}\eta\right)/\Gamma_{\text{total}}$ $\qquad\qquad\Gamma_{115}/\Gamma$

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
$\mathbf{4.5^{+0.7}_{-0.6}}$ **OUR AVERAGE**					
$5.2\pm0.3^{+3.2}_{-1.2}$	527	[1] ABLIKIM	13S	BES3	$\psi(2S)\rightarrow\eta p\overline{p}$
$4.4\pm0.6\pm0.3$	123	[2] ALEXANDER	10	CLEO	$\psi(2S)\rightarrow\eta p\overline{p}$

[1] With $N(1535)$ decaying to $p\eta$.
[2] From a fit of the $p\overline{p}$ and $p\eta$ distributions to a combination of $N^*(1535)\overline{p}$ and a broad $p\overline{p}$ enhancement around 2100 MeV.

$\Gamma\left(p\overline{p}\pi^+\pi^-\pi^0\right)/\Gamma_{\text{total}}$ $\qquad\qquad\Gamma_{116}/\Gamma$

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
$\mathbf{7.3\pm0.4\pm0.6}$	434.9	BRIERE	05	CLEO	$e^+e^-\rightarrow\psi(2S)\rightarrow$ $p\overline{p}\pi^+\pi^-\pi^0$

$\Gamma(p\overline{p}\rho^0)/\Gamma_{total}$ $\qquad$ Γ_{117}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
0.5±0.1±0.2	61.1	BRIERE	05	CLEO	$e^+e^- \to \psi(2S) \to$ $p\overline{p}\pi^+\pi^-$

$\Gamma(p\overline{p}\omega)/\Gamma_{total}$ $\qquad$ Γ_{118}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
0.69±0.21 OUR AVERAGE					
0.6 ±0.2 ±0.2	21.2	BRIERE	05	CLEO	$e^+e^- \to \psi(2S) \to$ $p\overline{p}\pi^+\pi^-\pi^0$
0.8 ±0.3 ±0.1	14.9 ± 0.1	[1] BAI	03B	BES	$\psi(2S) \to p\overline{p}\pi^+\pi^-\pi^0$

[1] Normalized to B($\psi(2S) \to J/\psi\pi^+\pi^-$) = 0.305 ± 0.016.

$\Gamma(p\overline{p}\eta')/\Gamma_{total}$ $\qquad$ Γ_{119}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
1.10±0.10±0.08	491	[1] ABLIKIM	19N	BES3	$\psi(2S) \to \eta' p\overline{p}$

[1] From the combination of $p\overline{p}\eta' \to p\overline{p}\pi^+\pi^-\eta$ and $p\overline{p}\eta' \to p\overline{p}\pi^+\pi^-\gamma$ channels.

$\Gamma(p\overline{p}\phi)/\Gamma_{total}$ $\qquad$ Γ_{120}/Γ

VALUE (units 10^{-6})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
6.06±0.38±0.48		753	ABLIKIM	19AO	BES3	$e^+e^- \to \psi(2S) \to$ $p\overline{p}K^+K^-$

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

<24	90		BRIERE	05	CLEO	$e^+e^- \to \psi(2S) \to$ $p\overline{p}K^+K^-$
<26	90		[1] BAI	03B	BES	$\psi(2S) \to$ $K^+K^- p\overline{p}$

[1] Normalized to B($\psi(2S) \to J/\psi\pi^+\pi^-$) = 0.305 ± 0.016.

$\Gamma(\phi X(1835) \to p\overline{p}\phi)/\Gamma_{total}$ $\qquad$ Γ_{121}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<1.82 × 10⁻⁷	90	ABLIKIM	19AO	BES3	$e^+e^- \to \psi(2S) \to$ $p\overline{p}K^+K^-$

$\Gamma(p\overline{n}\pi^- \text{ or c.c.})/\Gamma_{total}$ $\qquad$ Γ_{122}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
2.48±0.17 OUR AVERAGE					
2.45±0.11±0.21	851	ABLIKIM	06I	BES2	$e^+e^- \to p\pi^- X$
2.52±0.12±0.22	849	ABLIKIM	06I	BES2	$e^+e^- \to \overline{p}\pi^+ X$

$\Gamma(p\overline{n}\pi^-\pi^0)/\Gamma_{total}$ $\qquad$ Γ_{123}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
3.18±0.50±0.50	135 ± 21	ABLIKIM	06I	BES2	$e^+e^- \to p\pi^-\pi^0 X$

$\Gamma(\Lambda\overline{\Lambda})/\Gamma_{total}$ $\qquad$ Γ_{124}/Γ

VALUE (units 10^{-4})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
3.81±0.13 OUR AVERAGE Error includes scale factor of 1.4. See the ideogram below.						
3.97±0.02±0.12		31k	ABLIKIM	17L	BES3	$e^+e^- \to \Lambda\overline{\Lambda}$

$3.71\pm0.05\pm0.15$	6.5k	[1] DOBBS	17		$e^+e^- \to \Lambda\overline{\Lambda}$
$3.39\pm0.20\pm0.32$	337	ABLIKIM	07C	BES	$e^+e^- \to \psi(2S) \to$ hadrons
$6.4 \pm1.8 \pm0.1$		[2] AUBERT	07BD	BABR	$10.6\ e^+e^- \to \Lambda\overline{\Lambda}\gamma$
$3.28\pm0.23\pm0.25$	208	PEDLAR	05	CLEO	$e^+e^- \to \psi(2S) \to$ hadrons

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

$3.75\pm0.09\pm0.23$	1.9k	[1,3] DOBBS	14		$e^+e^- \to \Lambda\overline{\Lambda}$
$1.81\pm0.20\pm0.27$	80	[4] BAI	01	BES	$e^+e^- \to \psi(2S) \to$ hadrons
< 4	90	FELDMAN	77	MRK1	$e^+e^- \to \psi(2S) \to$ hadrons

WEIGHTED AVERAGE
3.81±0.13 (Error scaled by 1.4)

			χ^2
ABLIKIM	17L	BES3	1.7
DOBBS	17		0.4
ABLIKIM	07C	BES	1.2
AUBERT	07BD	BABR	
PEDLAR	05	CLEO	2.4
			5.8

(Confidence Level = 0.122)
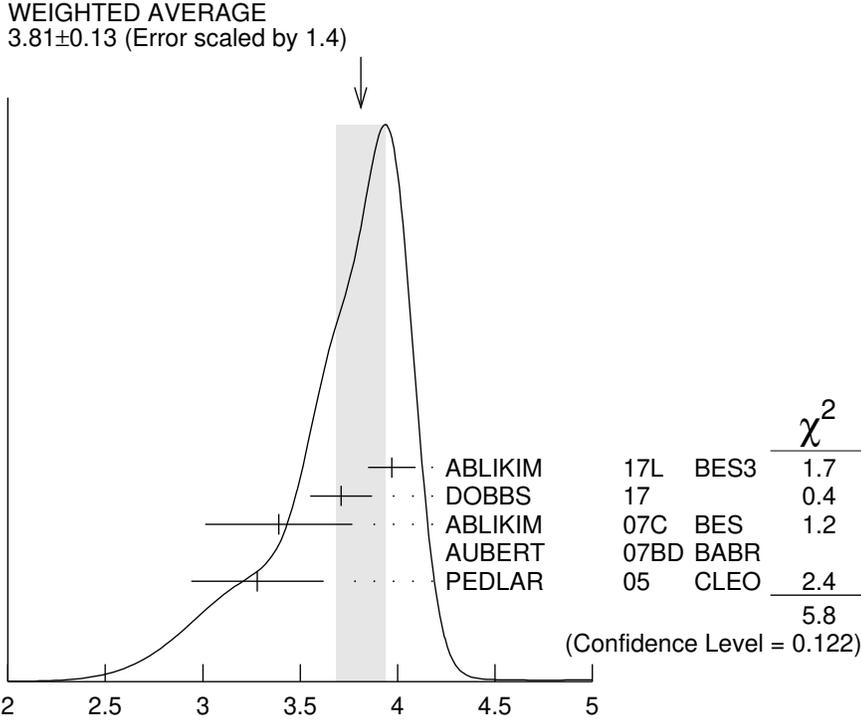
[1] Using CLEO-c data but not authored by the CLEO Collaboration.

[2] AUBERT 07BD reports $[\Gamma(\psi(2S) \to \Lambda\overline{\Lambda})/\Gamma_{total}] \times [\Gamma(\psi(2S) \to e^+e^-)] = (15 \pm 4 \pm 1) \times 10^{-4}$ keV which we divide by our best value $\Gamma(\psi(2S) \to e^+e^-) = 2.33 \pm 0.04$ keV. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[3] Superseded by DOBBS 17.

[4] Estimated using B$(\psi(2S) \to J/\psi \pi^+\pi^-) = 0.310 \pm 0.028$.

$\Gamma(\Lambda\overline{\Lambda})/\Gamma_{total}$ (units 10^{-4})

$\Gamma(\Lambda\overline{\Lambda}\pi^0)/\Gamma_{total}$ $\qquad\qquad$ Γ_{125}/Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID		TECN	COMMENT
< 0.29	90	[1] ABLIKIM	13F	BES3	$\psi(2S) \to p\overline{p}\pi^+\pi^-\gamma\gamma$

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

<12	90	[2] ABLIKIM	07H	BES2	$e^+e^- \to \psi(2S)$

[1] Using B$(\Lambda \to \pi^- p) = 63.9\%$ and B$(\pi^0 \to \gamma\gamma) = 98.8\%$.

[2] Using B$(\Lambda \to \pi^- p) = 63.9\%$ and B$(\eta \to \gamma\gamma) = 39.4\%$.

$\Gamma(\Lambda\overline{\Lambda}\eta)/\Gamma_{total}$ $\qquad$ Γ_{126}/Γ

VALUE (units 10^{-5})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
2.48±0.34±0.19		60	[1] ABLIKIM	13F	BES3	$\psi(2S) \to p\overline{p}\pi^+\pi^-\gamma\gamma$

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

<4.9	90		[2] ABLIKIM	07H	BES2	$e^+e^- \to \psi(2S)$

[1] Using B($\Lambda \to \pi^- p$) = 63.9% and B($\eta \to \gamma\gamma$) = 39.31%.
[2] Using B($\Lambda \to \pi^- p$) = 63.9%.

$\Gamma(\Lambda\overline{\Lambda}\pi^+\pi^-)/\Gamma_{total}$ $\qquad$ Γ_{127}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
2.8±0.4±0.5	73.4	BRIERE	05	CLEO	$e^+e^- \to \psi(2S) \to$ $p\overline{p}2(\pi^+\pi^-)$

$\Gamma(\Lambda\overline{p}K^+)/\Gamma_{total}$ $\qquad$ Γ_{128}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
1.0±0.1±0.1	74.0	BRIERE	05	CLEO	$e^+e^- \to \psi(2S) \to$ $p\overline{p}K^+\pi^-$

$\Gamma(\Lambda\overline{p}K^*(892)^+ + c.c.)/\Gamma_{total}$ $\qquad$ Γ_{129}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
6.3±0.5±0.5	1011	ABLIKIM	19AU	BES3	$e^+e^- \to \psi(2S)$

$\Gamma(\Lambda\overline{p}K^+\pi^+\pi^-)/\Gamma_{total}$ $\qquad$ Γ_{130}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
1.8±0.3±0.3	45.8	BRIERE	05	CLEO	$e^+e^- \to \psi(2S) \to$ $p\overline{p}K^+\pi^+\pi^-\pi^-$

$\Gamma(\overline{\Lambda}nK_S^0 + c.c.)/\Gamma_{total}$ $\qquad$ Γ_{131}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
0.81±0.11±0.14	50	[1] ABLIKIM	08C	BES2	$e^+e^- \to J/\psi$

[1] Using B($\overline{\Lambda} \to \overline{p}\pi^+$) = 63.9% and B($K_S^0 \to \pi^+\pi^-$) = 69.2%.

$\Gamma(\Delta^{++}\overline{\Delta}^{--})/\Gamma_{total}$ $\qquad$ Γ_{132}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
12.8±1.0±3.4	157	[1] BAI	01	BES	$e^+e^- \to \psi(2S) \to$ hadrons

[1] Estimated using B($\psi(2S) \to J/\psi\pi^+\pi^-$)= 0.310 ± 0.028.

$\Gamma(\Lambda\overline{\Sigma}^+\pi^- + c.c.)/\Gamma_{total}$ $\qquad$ Γ_{133}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
1.40±0.03±0.13	2.8k	ABLIKIM	13W	BES3	$\psi(2S) \to$ hadrons

$\Gamma(\Lambda\overline{\Sigma}^-\pi^+ + c.c.)/\Gamma_{total}$ $\qquad$ Γ_{134}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
1.54±0.04±0.13	2.8k	ABLIKIM	13W	BES3	$\psi(2S) \to$ hadrons

$\Gamma(\Lambda\overline{\Sigma}^0 + \text{c.c.})/\Gamma_{\text{total}}$ $\qquad\qquad$ Γ_{135}/Γ

VALUE (units 10^{-6})	EVTS	DOCUMENT ID	TECN	COMMENT
1.60±0.31±0.59	60	ABLIKIM 21L	BES3	$e^+e^- \to \psi(2S) \to$ hadrons

$\Gamma(\Lambda\overline{\Sigma}^0)/\Gamma_{\text{total}}$ $\qquad\qquad$ Γ_{136}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
1.23±0.23±0.08	30	[1] DOBBS 17	$e^+e^- \to \psi(2S) \to$ hadrons

[1] Using CLEO-c data but not authored by the CLEO Collaboration.

$\Gamma(\Sigma^0\overline{p}K^+ + \text{c.c.})/\Gamma_{\text{total}}$ $\qquad\qquad$ Γ_{137}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT
1.67±0.13±0.12	276	[1] ABLIKIM 13D	BES3	$\psi(2S) \to \gamma\Lambda\overline{p}K^+$

[1] Using B($\Lambda \to p\pi^-$) = 63.9%, and B($\Sigma^0 \to \Lambda\gamma$) = 100%.

$\Gamma(\Sigma^+\overline{\Sigma}^-)/\Gamma_{\text{total}}$ $\qquad\qquad$ Γ_{138}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
2.43±0.10 OUR AVERAGE		Error includes scale factor of 1.4.		
2.52±0.04±0.09	5.4k	ABLIKIM 21AT	BES3	$\psi(2S) \to p\pi^0\overline{p}\pi^0$
2.31±0.06±0.10	1.9k	[1] DOBBS 17		$e^+e^- \to \psi(2S) \to$ hadrons
2.57±0.44±0.68	35	PEDLAR 05	CLEO	$e^+e^- \to \psi(2S) \to$ hadrons
• • • We do not use the following data for averages, fits, limits, etc. • • •				
2.51±0.15±0.16	281	[1,2] DOBBS 14		$e^+e^- \to \psi(2S) \to$ hadrons

[1] Using CLEO-c data but not authored by the CLEO Collaboration.
[2] Superseded by DOBBS 17.

$\Gamma(\Sigma^0\overline{\Sigma}^0)/\Gamma_{\text{total}}$ $\qquad\qquad$ Γ_{139}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
2.35±0.09 OUR AVERAGE		Error includes scale factor of 1.1.		
2.44±0.03±0.11	7k	ABLIKIM 17L	BES3	$e^+e^- \to \psi(2S) \to$ hadrons
2.22±0.05±0.11	2.6k	[1] DOBBS 17		$e^+e^- \to \psi(2S) \to$ hadrons
2.35±0.36±0.32	59	ABLIKIM 07C	BES	$e^+e^- \to \psi(2S) \to$ hadrons
2.63±0.35±0.21	58	PEDLAR 05	CLEO	$e^+e^- \to \psi(2S) \to$ hadrons
• • • We do not use the following data for averages, fits, limits, etc. • • •				
2.25±0.11±0.16	439	[1,2] DOBBS 14		$e^+e^- \to \psi(2S) \to$ hadrons
1.2 ±0.4 ±0.4	8	[3] BAI 01	BES	$e^+e^- \to \psi(2S) \to$ hadrons

[1] Using CLEO-c data but not authored by the CLEO Collaboration.
[2] Superseded by DOBBS 17.
[3] Estimated using B($\psi(2S) \to J/\psi\pi^+\pi^-$)= 0.310 ± 0.028.

$\Gamma(\Sigma(1385)^+\overline{\Sigma}(1385)^-)/\Gamma_{\text{total}}$ $\qquad\qquad$ Γ_{140}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT
8.5±0.7 OUR AVERAGE				
8.4±0.5±0.5	1.5k	ABLIKIM 16L	BES3	$\psi(2S) \to \Sigma(1385)^+\overline{\Sigma}(1385)^-$
11 ±3 ±3	14	[1] BAI 01	BES	$e^+e^- \to \psi(2S) \to$ hadrons

[1] Estimated using B($\psi(2S) \to J/\psi\pi^+\pi^-$)= 0.310 ± 0.028.

$\Gamma\left(\Sigma(1385)^-\overline{\Sigma}(1385)^+\right)/\Gamma_{total}$ $\hspace{2cm}$ Γ_{141}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
8.5±0.6±0.6	1.4k	ABLIKIM	16L	BES3	$\psi(2S) \to \Sigma(1385)^-\overline{\Sigma}(1385)^+$

$\Gamma\left(\Sigma(1385)^0\overline{\Sigma}(1385)^0\right)/\Gamma_{total}$ $\hspace{2cm}$ Γ_{142}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
0.69±0.05±0.05	2.2k	ABLIKIM	17E	BES3	$e^+e^- \to \psi(2S) \to$ hadrons

$\Gamma\left(\Xi^-\overline{\Xi}^+\right)/\Gamma_{total}$ $\hspace{2cm}$ Γ_{143}/Γ

VALUE (units 10^{-4})	CL%	EVTS		DOCUMENT ID		TECN	COMMENT
2.87±0.11 OUR AVERAGE				Error includes scale factor of 1.1.			
3.03±0.05±0.14		3.6k	[1]	DOBBS	17		$e^+e^- \to \psi(2S) \to$ hadrons
2.78±0.05±0.14		5k		ABLIKIM	16L	BES3	$\psi(2S) \to \Xi^-\overline{\Xi}^+$
3.03±0.40±0.32		67		ABLIKIM	07C	BES	$e^+e^- \to \psi(2S) \to$ hadrons
2.38±0.30±0.21		63		PEDLAR	05	CLEO	$e^+e^- \to \psi(2S) \to$ hadrons
• • • We do not use the following data for averages, fits, limits, etc. • • •							
2.66±0.12±0.20		548	[1,2]	DOBBS	14		$e^+e^- \to \psi(2S) \to$ hadrons
0.94±0.27±0.15		12	[3]	BAI	01	BES	$e^+e^- \to \psi(2S) \to$ hadrons
<2	90			FELDMAN	77	MRK1	$e^+e^- \to \psi(2S) \to$ hadrons

[1] Using CLEO-c data but not authored by the CLEO Collaboration.
[2] Superseded by DOBBS 17.
[3] Estimated using B($\psi(2S) \to J/\psi\pi^+\pi^-$)= 0.310 ± 0.028.

$\Gamma\left(\Xi^0\overline{\Xi}^0\right)/\Gamma_{total}$ $\hspace{2cm}$ Γ_{144}/Γ

VALUE (units 10^{-4})	EVTS		DOCUMENT ID		TECN	COMMENT
2.3 ±0.4 OUR AVERAGE			Error includes scale factor of 4.2.			
2.73±0.03±0.13	11k		ABLIKIM	17E	BES3	$e^+e^- \to \psi(2S) \to$ hadrons
1.97±0.06±0.11	1.2k	[1]	DOBBS	17		$e^+e^- \to \psi(2S) \to$ hadrons
2.75±0.64±0.61	19		PEDLAR	05	CLEO	$e^+e^- \to \psi(2S) \to$ hadrons
• • • We do not use the following data for averages, fits, limits, etc. • • •						
2.02±0.19±0.15	112	[1,2]	DOBBS	14		$e^+e^- \to \psi(2S) \to$ hadrons

[1] Using CLEO-c data but not authored by the CLEO Collaboration.
[2] Superseded by DOBBS 17.

$\Gamma\left(\Xi(1530)^0\overline{\Xi}(1530)^0\right)/\Gamma_{total}$ $\hspace{2cm}$ Γ_{145}/Γ

VALUE (units 10^{-5})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
6.77±0.14±0.39		2951	ABLIKIM	21AO	BES3	$e^+e^- \to \psi(2S) \to$ hadrons
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<32	90		PEDLAR	05	CLEO	$e^+e^- \to \psi(2S) \to$ hadrons
< 8.1	90		[1] BAI	01	BES	$e^+e^- \to \psi(2S) \to$ hadrons

[1] Estimated using B($\psi(2S) \to J/\psi\pi^+\pi^-$) = 0.310 ± 0.028.

$\Gamma\left(\Lambda\overline{\Xi}^+ K^- + \text{c.c.}\right)/\Gamma_{total}$ $\hspace{2cm}$ Γ_{146}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
3.86±0.27±0.32	236	ABLIKIM	15I	BES3	$e^+e^- \to \psi(2S) \to K^-\Lambda\overline{\Xi}^+ + \text{c.c.}$

$\Gamma\left(\Xi(1530)^-\,\overline{\Xi}(1530)^+\right)/\Gamma_{total}$ $\qquad$ Γ_{147}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
11.45±0.40±0.59	5k	ABLIKIM	19AT	BES3	$e^+e^- \to \psi(2S) \to$ hadrons

$\Gamma\left(\Xi(1530)^-\,\overline{\Xi}^+\right)/\Gamma_{total}$ $\qquad$ Γ_{148}/Γ

VALUE (units 10^{-6})	EVTS	DOCUMENT ID		TECN	COMMENT
7.0±1.1±0.4	399	ABLIKIM	19AT	BES3	$e^+e^- \to \psi(2S) \to$ hadrons

$\Gamma\left(\Xi(1530)^0\,\overline{\Xi}^0\right)/\Gamma_{total}$ $\qquad$ Γ_{149}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
0.53±0.04±0.03	278	ABLIKIM	21AO	BES3	$e^+e^- \to \psi(2S) \to$ hadrons

$\Gamma\left(\Xi(1690)^-\,\overline{\Xi}^+ \to K^-\Lambda\overline{\Xi}^+ + \text{c.c.}\right)/\Gamma_{total}$ $\qquad$ Γ_{150}/Γ

VALUE (units 10^{-6})	EVTS	DOCUMENT ID	TECN	COMMENT
5.21±1.48±0.57	74	ABLIKIM 15I	BES3	$e^+e^- \to \psi(2S) \to$ $K^-\Lambda\overline{\Xi}^+ + \text{c.c.}$

$\Gamma\left(\Xi(1820)^-\,\overline{\Xi}^+ \to K^-\Lambda\overline{\Xi}^+ + \text{c.c.}\right)/\Gamma_{total}$ $\qquad$ Γ_{151}/Γ

VALUE (units 10^{-6})	EVTS	DOCUMENT ID	TECN	COMMENT
12.03±2.94±1.22	136	ABLIKIM 15I	BES3	$e^+e^- \to \psi(2S) \to$ $K^-\Lambda\overline{\Xi}^+ + \text{c.c.}$

$\Gamma\left(\Sigma^0\,\overline{\Xi}^+ K^- + \text{c.c.}\right)/\Gamma_{total}$ $\qquad$ Γ_{152}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT
3.67±0.33±0.28	142	ABLIKIM 15I	BES3	$e^+e^- \to \psi(2S) \to$ $K^-\Sigma^0\overline{\Xi}^+ + \text{c.c.}$

$\Gamma\left(\Omega^-\,\overline{\Omega}^+\right)/\Gamma_{total}$ $\qquad$ Γ_{153}/Γ

VALUE (units 10^{-5})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
5.66±0.30 OUR AVERAGE			Error includes scale factor of 1.3.			
5.85±0.12±0.25		4k	[1] ABLIKIM	21E	BES3	$\psi(2S) \to \Omega^-\overline{\Omega}^+ \to$ $\Lambda K^-\overline{\Lambda}K^+$
5.2 ±0.3 ±0.3		326	[1,2] DOBBS	17		$e^+e^- \to \psi(2S) \to$ hadrons
• • • We do not use the following data for averages, fits, limits, etc. • • •						
4.7 ±0.9 ±0.5		27	[1,2,3] DOBBS	14		$e^+e^- \to \psi(2S) \to$ hadrons
<15	90		ABLIKIM	12Q	BES2	$e^+e^- \to \psi(2S) \to$ hadrons
<16	90		PEDLAR	05	CLEO	$e^+e^- \to \psi(2S) \to$ hadrons
< 7.3	90		[4] BAI	01	BES	$e^+e^- \to \psi(2S) \to$ hadrons

[1] Using B($\Omega^- \to \Lambda K^-$) = (67.8 ± 0.7)% and B($\Lambda \to p\pi^-$) = (63.9 ± 0.5)%.
[2] Using CLEO-c data but not authored by the CLEO Collaboration.
[3] Superseded by DOBBS 17.
[4] Estimated using B($\psi(2S) \to J/\psi\pi^+\pi^-$) = 0.310 ± 0.028.

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

VALUE (units 10^{-3})	CL%	DOCUMENT ID	TECN	COMMENT
<1.0	90	PEDLAR 07	CLEO	$e^+ e^- \to \psi(2S)$

$\Gamma(h_c(1P)\pi^0)/\Gamma_{total}$ Γ_{155}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
8.6±1.3 OUR AVERAGE				
9.0±1.5±1.3	3k	[1] GE 11	CLEO	$\psi(2S) \to \pi^0$ anything
8.4±1.3±1.0	11k	ABLIKIM 10B	BES3	$\psi(2S) \to \pi^0 h_c$

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

seen	92^{+23}_{-22}	ADAMS 09	CLEO	$\psi(2S) \to 2\pi^+ 2\pi^- 2\pi^0$
seen	1282	DOBBS 08A	CLEO	$\psi(2S) \to \pi^0 \eta_c \gamma$
seen	168 ± 40	ROSNER 05	CLEO	$\psi(2S) \to \pi^0 \eta_c \gamma$

[1] Assuming a width $\Gamma(h_c(1P)) = 0.86$ MeV $\equiv \Gamma_0$, a measured dependence of the central value of $B = (7.6 + 1.4 \times \Gamma(h_c(1P)/\Gamma_0) \times 10^{-4}$, and with a systematic error that accounts for the width variation range 0.43–1.29 MeV.

$\Gamma(\Lambda_c^+ \overline{p} e^+ e^- + \text{c.c.})/\Gamma_{total}$ Γ_{156}/Γ

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
<1.7 × 10^{-6}	90	450M	ABLIKIM 18Q	BES3	$e^+ e^- \to \psi(2S)$

$\Gamma(\Theta(1540)\overline{\Theta}(1540) \to K^0_S p K^- \overline{n} + \text{c.c.})/\Gamma_{total}$ Γ_{157}/Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID	TECN	COMMENT
<0.88	90	BAI 04G	BES2	$e^+ e^-$

$\Gamma(\Theta(1540) K^- \overline{n} \to K^0_S p K^- \overline{n})/\Gamma_{total}$ Γ_{158}/Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID	TECN	COMMENT
<1.0	90	BAI 04G	BES2	$e^+ e^-$

$\Gamma(\Theta(1540) K^0_S \overline{p} \to K^0_S \overline{p} K^+ n)/\Gamma_{total}$ Γ_{159}/Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID	TECN	COMMENT
<0.70	90	BAI 04G	BES2	$e^+ e^-$

$\Gamma(\overline{\Theta}(1540) K^+ n \to K^0_S \overline{p} K^+ n)/\Gamma_{total}$ Γ_{160}/Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID	TECN	COMMENT
<2.6	90	BAI 04G	BES2	$e^+ e^-$

$\Gamma(\overline{\Theta}(1540) K^0_S p \to K^0_S p K^- \overline{n})/\Gamma_{total}$ Γ_{161}/Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID	TECN	COMMENT
<0.60	90	BAI 04G	BES2	$e^+ e^-$

———— **RADIATIVE DECAYS** ————

$\Gamma(\gamma\chi_{c0}(1P))/\Gamma_{total}$ $\qquad\qquad\qquad$ Γ_{162}/Γ

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
9.79 ±0.20 OUR FIT					
9.33 ±0.26 OUR AVERAGE					
$9.389\pm0.014\pm0.332$	4.7M	ABLIKIM	17U	BES3	$e^+e^- \to \gamma X$
$9.22 \pm0.11 \pm0.46$	72k	ATHAR	04	CLEO	$e^+e^- \to \gamma X$
$9.9 \pm0.5 \pm0.8$		[1] GAISER	86	CBAL	$e^+e^- \to \gamma X$
7.2 ± 2.3		[1] BIDDICK	77	CNTR	$e^+e^- \to \gamma X$
7.5 ± 2.6		[1] WHITAKER	76	MRK1	e^+e^-

[1] Angular distribution $(1+\cos^2\theta)$ assumed.

$\Gamma(\gamma\chi_{c1}(1P))/\Gamma_{total}$ $\qquad\qquad\qquad$ Γ_{163}/Γ

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
9.75 ±0.24 OUR FIT					
9.54 ±0.29 OUR AVERAGE					
$9.905\pm0.011\pm0.353$	5.0M	ABLIKIM	17U	BES3	$e^+e^- \to \gamma X$
$9.07 \pm0.11 \pm0.54$	76k	ATHAR	04	CLEO	$e^+e^- \to \gamma X$
$9.0 \pm0.5 \pm0.7$		[1] GAISER	86	CBAL	$e^+e^- \to \gamma X$
7.1 ± 1.9		[2] BIDDICK	77	CNTR	$e^+e^- \to \gamma X$

[1] Angular distribution $(1-0.189\cos^2\theta)$ assumed.
[2] Valid for isotropic distribution of the photon.

$\Gamma(\gamma\chi_{c0}(1P))/\Gamma(\gamma\chi_{c1}(1P))$ $\qquad\qquad$ $\Gamma_{162}/\Gamma_{163}$

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$1.02\pm0.01\pm0.07$	[1] ATHAR	04	CLEO	$e^+e^- \to \gamma X$

[1] Not independent from ATHAR 04 measurements of B($\gamma\chi_{cJ}$).

$\Gamma(\gamma\chi_{c2}(1P))/\Gamma_{total}$ $\qquad\qquad\qquad$ Γ_{164}/Γ

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
9.52 ±0.20 OUR FIT					
9.42 ±0.31 OUR AVERAGE Error includes scale factor of 1.3. See the ideogram below.					
$9.621\pm0.013\pm0.272$	4.2M	ABLIKIM	17U	BES3	$e^+e^- \to \gamma X$
$9.33 \pm0.14 \pm0.61$	79k	ATHAR	04	CLEO	$e^+e^- \to \gamma X$
$8.0 \pm0.5 \pm0.7$		[1] GAISER	86	CBAL	$e^+e^- \to \gamma X$
7.0 ± 2.0		[2] BIDDICK	77	CNTR	$e^+e^- \to \gamma X$

[1] Angular distribution $(1-0.052\cos^2\theta)$ assumed.
[2] Valid for isotropic distribution of the photon.

WEIGHTED AVERAGE
9.42±0.31 (Error scaled by 1.3)

Values above of weighted average, error,
and scale factor are based upon the data in
this ideogram only. They are not neces-
sarily the same as our 'best' values,
obtained from a least-squares constrained fit
utilizing measurements of other (related)
quantities as additional information.

			χ^2
ABLIKIM	17U	BES3	0.6
ATHAR	04	CLEO	0.0
GAISER	86	CBAL	2.7
BIDDICK	77	CNTR	
			3.3

(Confidence Level = 0.193)

$\Gamma(\gamma\chi_{c2}(1P))/\Gamma_{\text{total}}$ (units 10^{-2})

$[\Gamma(\gamma\chi_{c0}(1P)) + \Gamma(\gamma\chi_{c1}(1P)) + \Gamma(\gamma\chi_{c2}(1P))]/\Gamma_{\text{total}}$ $(\Gamma_{162}+\Gamma_{163}+\Gamma_{164})/\Gamma$

VALUE	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
27.6±0.3±2.0	[1] ATHAR	04 CLEO	$e^+e^- \to \gamma X$

[1] Not independent from ATHAR 04 measurements of B($\gamma\chi_{cJ}$).

$\Gamma(\gamma\chi_{c0}(1P))/\Gamma(\gamma\chi_{c2}(1P))$ $\Gamma_{162}/\Gamma_{164}$

VALUE	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.99±0.02±0.08	[1] ATHAR	04 CLEO	$e^+e^- \to \gamma X$

[1] Not independent from ATHAR 04 measurements of B($\gamma\chi_{cJ}$).

$\Gamma(\gamma\chi_{c2}(1P))/\Gamma(\gamma\chi_{c1}(1P))$ $\Gamma_{164}/\Gamma_{163}$

VALUE	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
1.03±0.02±0.03	[1] ATHAR	04 CLEO	$e^+e^- \to \gamma X$

[1] Not independent from ATHAR 04 measurements of B($\gamma\chi_{cJ}$).

## $\Gamma(\gamma\eta_c(1S))/\Gamma_{\text{total}}$ Γ_{165}/Γ

VALUE (units 10^{-2})	EVTS	DOCUMENT ID	TECN	COMMENT
0.34 ±0.05 OUR AVERAGE		Error includes scale factor of 1.3. See the ideogram below.		
0.432±0.016±0.060		MITCHELL	09 CLEO	$e^+e^- \to \gamma X$
0.32 ±0.04 ±0.06	2.5k	[1] ATHAR	04 CLEO	$e^+e^- \to \gamma X$

0.28 $\pm$0.06   [2] GAISER   86   CBAL $e^+e^- \to \gamma X$

[1] ATHAR 04 used $\Gamma_{\eta_c(1S)} = 24.8 \pm 4.9$ MeV to obtain this result.

[2] GAISER 86 used $\Gamma_{\eta_c(1S)} = 11.5 \pm 4.5$ MeV to obtain this result.

WEIGHTED AVERAGE
0.34±0.05 (Error scaled by 1.3)

			χ^2
MITCHELL	09	CLEO	2.0
ATHAR	04	CLEO	0.1
GAISER	86	CBAL	1.2
			3.3

(Confidence Level = 0.196)

$\Gamma(\gamma\eta_c(1S))/\Gamma_{\text{total}}$ (units 10^{-2})

$\Gamma(\gamma\eta_c(2S))/\Gamma_{\text{total}}$ Γ_{166}/Γ
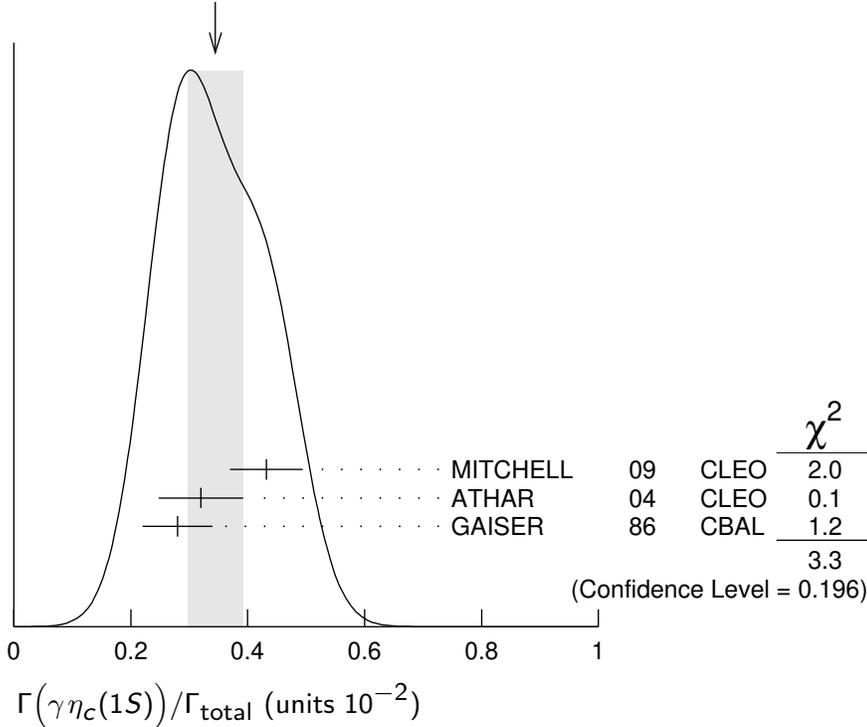
VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
7±2±4		[1] ABLIKIM	12G	BES3	$\psi(2S) \to \gamma K^0 K\pi, K K\pi^0$

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

< 8	90	[2] CRONIN-HEN..10		CLEO	$\psi(2S) \to \gamma K\overline{K}\pi$
<20	90	ATHAR	04	CLEO	$e^+e^- \to \gamma X$
20–130	95	EDWARDS	82C	CBAL	$e^+e^- \to \gamma X$

[1] ABLIKIM 12G reports $[\Gamma(\psi(2S) \to \gamma\eta_c(2S))/\Gamma_{\text{total}}] \times [B(\eta_c(2S) \to K\overline{K}\pi)] = (1.30 \pm 0.20 \pm 0.30) \times 10^{-5}$ which we divide by our best value $B(\eta_c(2S) \to K\overline{K}\pi) = (1.9 \pm 1.2) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[2] CRONIN-HENNESSY 10 reports $[\Gamma(\psi(2S) \to \gamma\eta_c(2S))/\Gamma_{\text{total}}] \times [B(\eta_c(2S) \to K\overline{K}\pi)] < 14.5 \times 10^{-6}$ which we divide by our best value $B(\eta_c(2S) \to K\overline{K}\pi) = 1.9 \times 10^{-2}$. This measurement assumes $\Gamma(\eta_c(2S)) = 14$ MeV. CRONIN-HENNESSY 10 gives the analytic dependence of limits on width.

$\Gamma(\gamma\pi^0)/\Gamma_{\text{total}}$ Γ_{167}/Γ

VALUE (units 10^{-6})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
1.04±0.22 OUR AVERAGE			Error includes scale factor of 1.4.			
0.95±0.16±0.05		423	ABLIKIM	17X	BES3	$\psi(2S) \to \gamma\pi^0$
1.58±0.40±0.13		37	ABLIKIM	10F	BES3	$\psi(2S) \to \gamma\pi^0$

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

< 5	90		PEDLAR	09 CLE3	$\psi(2S) \to \gamma X$
<5400	95	[1] LIBERMAN	75 SPEC	e^+e^-
< 1×10^4	90		WIIK	75 DASP	e^+e^-

[1] Restated by us using $B(\psi(2S) \to \mu^+\mu^-) = 0.0077$.

$\Gamma\left(\gamma 2(\pi^+\pi^-)\right)/\Gamma_{total}$ Γ_{168}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT
39.6±2.8±5.0	583	ABLIKIM 07D	BES2	$e^+e^- \to \psi(2S)$

$\Gamma\left(\gamma 3(\pi^+\pi^-)\right)/\Gamma_{total}$ Γ_{169}/Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID	TECN	COMMENT
<17	90	ABLIKIM 07D	BES2	$e^+e^- \to \psi(2S)$

$\Gamma\left(\gamma\eta'(958)\right)/\Gamma_{total}$ Γ_{170}/Γ

VALUE (units 10^{-4})	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
1.24 ±0.04 OUR AVERAGE					
1.251±0.022±0.062		56k	ABLIKIM 17X	BES3	$\psi(2S) \to \gamma\pi^+\pi^-\eta,$ $\gamma\pi^0\pi^0\eta$
1.26 ±0.03 ±0.08		2226	[1] ABLIKIM 10F	BES3	$\psi(2S) \to 3\gamma\pi^+\pi^-,$ $2\gamma\pi^+\pi^-$
1.19 ±0.08 ±0.03			PEDLAR 09	CLE3	$\psi(2S) \to \gamma X$
1.24 ±0.27 ±0.15		23	ABLIKIM 06R	BES2	$e^+e^- \to \psi(2S)$
1.54 ±0.31 ±0.20		~ 43	BAI 98F	BES	$\psi(2S) \to \pi^+\pi^-2\gamma,$ $\pi^+\pi^-3\gamma$

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

< 60	90	[2] BRAUNSCH...	77	DASP	e^+e^-
< 11	90	[3] BARTEL	76	CNTR	e^+e^-

[1] Combining the results from $\eta' \to \pi^+\pi^-\eta$ and $\eta' \to \pi^+\pi^-\gamma$ decay modes.
[2] Restated by us using total decay width 228 keV.
[3] The value is normalized to the branching ratio for $\Gamma(J/\psi(1S)\eta)/\Gamma_{total}$.

$\Gamma\left(\gamma f_2(1270)\right)/\Gamma_{total}$ Γ_{171}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
$2.73^{+0.29}_{-0.25}$ OUR AVERAGE Error includes scale factor of 1.8.				
$2.84\pm0.15^{+0.03}_{-0.10}$	1.9k	[1,2] DOBBS 15		$\psi(2S) \to \gamma\pi\pi$
$2.12\pm0.19\pm0.32$		[3,4] BAI 03C	BES	$\psi(2S) \to \gamma\pi\pi$

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

$2.08\pm0.19\pm0.33$	200.6 ± 18.8	[3] BAI 03C	BES	$\psi(2S) \to \gamma\pi^+\pi^-$
$2.90\pm1.08\pm1.07$	29.9 ± 11.1	[3] BAI 03C	BES	$\psi(2S) \to \gamma\pi^0\pi^0$

[1] Using CLEO-c data but not authored by the CLEO Collaboration.
[2] DOBBS 15 reports $[\Gamma(\psi(2S) \to \gamma f_2(1270))/\Gamma_{total}] \times [B(f_2(1270) \to \pi\pi)] = (2.39 \pm 0.09 \pm 0.09) \times 10^{-4}$ which we divide by our best value $B(f_2(1270) \to \pi\pi) = (84.2^{+2.9}_{-0.9}) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.
[3] Normalized to $B(\psi(2S) \to J/\psi\pi^+\pi^-) = 0.305 \pm 0.016$.
[4] Combining the results from $\pi^+\pi^-$ and $\pi^0\pi^0$ decay modes.

$\Gamma\left(\gamma f_0(1370) \to \gamma K \overline{K}\right)/\Gamma_{total}$ $\qquad$ Γ_{172}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		COMMENT
3.1±1.0±1.4	175	[1] DOBBS	15	$\psi(2S) \to \gamma K \overline{K}$

[1] Using CLEO-c data but not authored by the CLEO Collaboration.

$\Gamma\left(\gamma f_0(1500)\right)/\Gamma_{total}$ $\qquad$ Γ_{173}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		COMMENT
9.3±1.8±0.6	274	[1,2] DOBBS	15	$\psi(2S) \to \gamma \pi \pi$

[1] DOBBS 15 reports $[\Gamma(\psi(2S) \to \gamma f_0(1500))/\Gamma_{total}] \times [B(f_0(1500) \to \pi\pi)] = (3.2 \pm 0.6 \pm 0.2) \times 10^{-5}$ which we divide by our best value $B(f_0(1500) \to \pi\pi) = (34.5 \pm 2.2) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.
[2] Using CLEO-c data but not authored by the CLEO Collaboration.

$\Gamma\left(\gamma f_2'(1525)\right)/\Gamma_{total}$ $\qquad$ Γ_{174}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		COMMENT
3.3±0.8±0.1	136	[1,2] DOBBS	15	$\psi(2S) \to \gamma K \overline{K}$

[1] DOBBS 15 reports $[\Gamma(\psi(2S) \to \gamma f_2'(1525))/\Gamma_{total}] \times [B(f_2'(1525) \to K \overline{K})] = (2.9 \pm 0.6 \pm 0.3) \times 10^{-5}$ which we divide by our best value $B(f_2'(1525) \to K \overline{K}) = (87.6 \pm 2.2) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.
[2] Using CLEO-c data but not authored by the CLEO Collaboration.

$\Gamma\left(\gamma f_0(1710) \to \gamma \pi \pi\right)/\Gamma_{total}$ $\qquad$ Γ_{176}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT
3.5 ±0.6 OUR AVERAGE				
3.6 ±0.4 ±0.5	290	[1] DOBBS	15	$\psi(2S) \to \gamma \pi \pi$
3.01±0.41±1.24	35.6 ± 4.8	[2] BAI	03C BES	$\psi(2S) \to \gamma \pi^+ \pi^-$

[1] Using CLEO-c data but not authored by the CLEO Collaboration.
[2] Normalized to $B(\psi(2S) \to J/\psi \pi^+ \pi^-) = 0.305 \pm 0.016$.

$\Gamma\left(\gamma f_0(1710) \to \gamma K \overline{K}\right)/\Gamma_{total}$ $\qquad$ Γ_{177}/Γ

VALUE (units 10^{-5})	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
6.6 ±0.7 OUR AVERAGE					
6.7 ±0.6 ±0.6		375	[1] DOBBS	15	$\psi(2S) \to \gamma K \overline{K}$
6.04±0.90±1.32		39.6 ± 5.9	[2,3] BAI	03C BES	$\psi(2S) \to \gamma K^+ K^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
< 15.6	90	6.8 ± 3.1	[2,3] BAI	03C BES	$\psi(2S) \to \gamma K_S^0 K_S^0$

[1] Using CLEO-c data but not authored by the CLEO Collaboration.
[2] Includes unknown branching fractions to $K^+ K^-$ or $K_S^0 K_S^0$. We have multiplied the $K^+ K^-$ result by a factor of 2 and the $K_S^0 K_S^0$ result by a factor of 4 to obtain the $K \overline{K}$ result.
[3] Normalized to $B(\psi(2S) \to J/\psi \pi^+ \pi^-) = 0.305 \pm 0.016$.

$\Gamma\left(\gamma f_0(2100) \to \gamma \pi \pi\right)/\Gamma_{total}$ $\qquad$ Γ_{178}/Γ

VALUE (units 10^{-6})	EVTS	DOCUMENT ID		COMMENT
4.8±0.5±0.9	373	[1] DOBBS	15	$\psi(2S) \to \gamma \pi \pi$

[1] Using CLEO-c data but not authored by the CLEO Collaboration.

$\Gamma\left(\gamma f_0(2200) \to \gamma K\overline{K}\right)/\Gamma_{total}$ $\qquad$ Γ_{179}/Γ

VALUE (units 10^{-6})	EVTS		DOCUMENT ID		COMMENT
3.2±0.6±0.8	207	[1]	DOBBS	15	$\psi(2S) \to \gamma K\overline{K}$

[1] Using CLEO-c data but not authored by the CLEO Collaboration.

$\Gamma\left(\gamma f_J(2220) \to \gamma\pi\pi\right)/\Gamma_{total}$ $\qquad$ Γ_{180}/Γ

VALUE	CL%		DOCUMENT ID		COMMENT
<5.8 × 10^{-6}	90	[1,2]	DOBBS	15	$\psi(2S) \to \gamma\pi\pi$

[1] Using CLEO-c data but not authored by the CLEO Collaboration.
[2] For $\Gamma = 20/50$ MeV, the 90% CL upper limits for $\pi^+\pi^-$ and $\pi^0\pi^0$ are $3.2/4.3 \times 10^{-6}$ and $2.6/4.0 \times 10^{-6}$, respectively.

$\Gamma\left(\gamma f_J(2220) \to \gamma K\overline{K}\right)/\Gamma_{total}$ $\qquad$ Γ_{181}/Γ

VALUE	CL%		DOCUMENT ID		COMMENT
<9.5 × 10^{-6}	90	[1,2]	DOBBS	15	$\psi(2S) \to \gamma K\overline{K}$

[1] Using CLEO-c data but not authored by the CLEO Collaboration.
[2] For $\Gamma = 20/50$ MeV, the 90% CL upper limits for K^+K^- and $K_S^0 K_S^0$ are $2.1/4.3\times10^{-6}$ and $3.7/5.5 \times 10^{-6}$, respectively.

$\Gamma\left(\gamma\eta\right)/\Gamma_{total}$ $\qquad$ Γ_{182}/Γ

VALUE (units 10^{-6})	CL%	EVTS		DOCUMENT ID		TECN	COMMENT
0.92±0.18 OUR AVERAGE							
0.85±0.18±0.04		382	[1]	ABLIKIM	17X	BES3	$\psi(2S) \to \gamma\pi^+\pi^-\pi^0,$ $\gamma 3\pi^0$
1.38±0.48±0.09		13	[1]	ABLIKIM	10F	BES3	$\psi(2S) \to \gamma\pi^+\pi^-\pi^0,$ $\gamma 3\pi^0$

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

< 2	90			PEDLAR	09	CLE3	$\psi(2S) \to \gamma X$
< 90	90			BAI	98F	BES	$\psi(2S) \to \pi^+\pi^- 3\gamma$
<200	90			YAMADA	77	DASP	$e^+e^- \to 3\gamma$

[1] Combining the results from $\eta \to \pi^+\pi^-\pi^0$ and $\eta \to 3\pi^0$ decay modes.

$\Gamma\left(\gamma\eta\pi^+\pi^-\right)/\Gamma_{total}$ $\qquad$ Γ_{183}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
8.71±1.25±1.64	418	ABLIKIM	06R	BES2	$\psi(2S) \to \gamma\eta\pi^+\pi^-$

$\Gamma\left(\gamma\eta(1405) \to \gamma K\overline{K}\pi\right)/\Gamma_{total}$ $\qquad$ Γ_{185}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<0.9	90	ABLIKIM	06R	BES2	$\psi(2S) \to \gamma K_S^0 K^+\pi^- +$ c.c.

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

<1.3	90	ABLIKIM	06R	BES2	$\psi(2S) \to \gamma K^+K^-\pi^0$
<1.2	90	[1] SCHARRE	80	MRK1	e^+e^-

[1] Includes unknown branching fraction $\eta(1405) \to K\overline{K}\pi$.

$\Gamma\left(\gamma\eta(1405) \to \gamma\eta\pi^+\pi^-\right)/\Gamma_{total}$ $\qquad$ Γ_{186}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
0.36±0.25±0.05	10	ABLIKIM	06R	BES2	$\psi(2S) \to \gamma\eta\pi^+\pi^-$

$\Gamma\left(\gamma\eta(1405)\to \gamma f_0(980)\pi^0 \to \gamma\pi^+\pi^-\pi^0\right)/\Gamma_{total}$ Γ_{187}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<5.0\times10^{-7}$	90	ABLIKIM	17AJ	BES3	$\psi(2S)\to\gamma\pi^+\pi^-\pi^0$

$\Gamma\left(\gamma\eta(1475)\to \gamma K\overline{K}\pi\right)/\Gamma_{total}$ Γ_{189}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<1.4	90	ABLIKIM	06R	BES2	$\psi(2S)\to\gamma K^+K^-\pi^0$

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

<1.5	90	ABLIKIM	06R	BES2	$\psi(2S)\to\gamma K^0_S K^+\pi^-$ + c.c.

$\Gamma\left(\gamma\eta(1475)\to \gamma\eta\pi^+\pi^-\right)/\Gamma_{total}$ Γ_{190}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<0.88	90	ABLIKIM	06R	BES2	$\psi(2S)\to\gamma\eta\pi^+\pi^-$

$\Gamma\left(\gamma K^{*0}K^+\pi^- + \text{c.c.}\right)/\Gamma_{total}$ Γ_{191}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
$37.0\pm6.1\pm7.2$	237	ABLIKIM	07D	BES2	$e^+e^-\to\psi(2S)$

$\Gamma\left(\gamma K^{*0}\overline{K}^{*0}\right)/\Gamma_{total}$ Γ_{192}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
$24.0\pm4.5\pm5.0$	41	ABLIKIM	07D	BES2	$e^+e^-\to\psi(2S)$

$\Gamma\left(\gamma K^0_S K^+\pi^- + \text{c.c.}\right)/\Gamma_{total}$ Γ_{193}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
$25.6\pm3.6\pm3.6$	115	ABLIKIM	07D	BES2	$e^+e^-\to\psi(2S)$

$\Gamma\left(\gamma K^+K^-\pi^+\pi^-\right)/\Gamma_{total}$ Γ_{194}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
$19.1\pm2.7\pm4.3$	132	ABLIKIM	07D	BES2	$e^+e^-\to\psi(2S)$

$\Gamma\left(\gamma K^+K^-2(\pi^+\pi^-)\right)/\Gamma_{total}$ Γ_{195}/Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID		TECN	COMMENT
<22	90	ABLIKIM	07D	BES2	$e^+e^-\to\psi(2S)$

$\Gamma\left(\gamma 2(K^+K^-)\right)/\Gamma_{total}$ Γ_{196}/Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID		TECN	COMMENT
<4	90	ABLIKIM	07D	BES2	$e^+e^-\to\psi(2S)$

$\Gamma\left(\gamma p\overline{p}\right)/\Gamma_{total}$ Γ_{197}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
3.9 ± 0.5 **OUR AVERAGE**		Error includes scale factor of 2.0.			
$4.18\pm0.26\pm0.18$	348	[1] ALEXANDER	10	CLEO	$\psi(2S)\to\gamma p\overline{p}$
$2.9\pm0.4\pm0.4$	142	ABLIKIM	07D	BES2	$e^+e^-\to\psi(2S)$

[1] From a fit of the $p\overline{p}$ mass distribution to a combination of $\gamma f_2(1950)$, $\gamma f_2(2150)$, and $\gamma p\overline{p}$ phase space, for $M(p\overline{p} < 2.85$ GeV, and accounting for backgrounds from $\psi(2S)\to\pi^0 p\overline{p}$ and continuum.

$\Gamma\big(\gamma f_2(1950) \to \gamma p \overline{p}\big)/\Gamma_{total}$ $\qquad$ Γ_{198}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT
1.2±0.2±0.1	111	[1] ALEXANDER 10	CLEO	$\psi(2S) \to \gamma p \overline{p}$

[1] From a fit of the $p\overline{p}$ mass distribution to a combination of $\gamma f_2(1950)$, $\gamma f_2(2150)$, and $\gamma p \overline{p}$ phase space, for $M(p\overline{p} < 2.85$ GeV, and accounting for backgrounds from $\psi(2S) \to \pi^0 p \overline{p}$ and continuum.

$\Gamma\big(\gamma f_2(2150) \to \gamma p \overline{p}\big)/\Gamma_{total}$ $\qquad$ Γ_{199}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT
0.72±0.18±0.03	73	[1] ALEXANDER 10	CLEO	$\psi(2S) \to \gamma p \overline{p}$

[1] From a fit of the $p\overline{p}$ mass distribution to a combination of $\gamma f_2(1950)$, $\gamma f_2(2150)$, and $\gamma p \overline{p}$ phase space, for $M(p\overline{p} < 2.85$ GeV, and accounting for backgrounds from $\psi(2S) \to \pi^0 p \overline{p}$ and continuum.

$\Gamma\big(\gamma X(1835) \to \gamma p \overline{p}\big)/\Gamma_{total}$ $\qquad$ Γ_{200}/Γ

VALUE (units 10^{-6})	CL%	DOCUMENT ID	TECN	COMMENT
$4.57\pm0.36^{+1.77}_{-4.26}$		ABLIKIM 12D	BES3	$J/\psi \to \gamma p \overline{p}$

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

<1.6	90	ALEXANDER 10	CLEO	$\psi(2S) \to \gamma p \overline{p}$
<5.4	90	ABLIKIM 07D	BES	$\psi(2S) \to \gamma p \overline{p}$

$\Gamma\big(\gamma X \to \gamma p \overline{p}\big)/\Gamma_{total}$ $\qquad$ Γ_{201}/Γ

For a narrow resonance in the range $2.2 < M(X) < 2.8$ GeV.

VALUE (units 10^{-6})	CL%	DOCUMENT ID	TECN	COMMENT
<2	90	ALEXANDER 10	CLEO	$\psi(2S) \to \gamma p \overline{p}$

$\Gamma\big(\gamma p \overline{p} \pi^+ \pi^-\big)/\Gamma_{total}$ $\qquad$ Γ_{202}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT
2.8±1.2±0.7	17	ABLIKIM 07D	BES2	$e^+ e^- \to \psi(2S)$

$\Gamma\big(\gamma \gamma J/\psi\big)/\Gamma_{total}$ $\qquad$ Γ_{204}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
$3.1\pm0.6^{+0.8}_{-1.0}$	1.1k	ABLIKIM 12O	BES3	$e^+ e^- \to \psi(2S)$

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

3.2±0.6	1.1k	[1] ABLIKIM 17N	BES3	$\psi(2S) \to \gamma \gamma J/\psi$

[1] Uses B($J/\psi \to e^+ e^-$) = (5.971 ± 0.032)% and B($J/\psi \to \mu^+ \mu^-$) = (5.961 ± 0.033)%. No systematic error estimation.

$\Gamma\big(e^+ e^- \eta'\big)/\Gamma_{total}$ $\qquad$ Γ_{205}/Γ

VALUE (units 10^{-6})	EVTS	DOCUMENT ID	TECN	COMMENT
1.90±0.26 OUR AVERAGE				
1.99±0.33±0.12	57	ABLIKIM 18Z	BES3	$\psi(2S) \to \eta' e^+ e^-$, $\eta' \to \gamma \pi^+ \pi^-$
1.79±0.38±0.11	20	ABLIKIM 18Z	BES3	$\psi(2S) \to \eta' e^+ e^-$, $\eta' \to \eta \pi^+ \pi^-$

$\Gamma\left(e^+ e^- \chi_{c0}(1P)\right)/\Gamma_{\text{total}}$ $\qquad$ Γ_{206}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
10.6±2.4±0.4	48	[1] ABLIKIM	17I	BES3	$\psi(2S) \to e^+ e^- \gamma J/\psi$

[1] ABLIKIM 17I reports $(11.7 \pm 2.5 \pm 1.0) \times 10^{-4}$ from a measurement of $[\Gamma(\psi(2S) \to e^+ e^- \chi_{c0}(1P))/\Gamma_{\text{total}}] \times [B(\chi_{c0}(1P) \to \gamma J/\psi(1S))]$ assuming $B(\chi_{c0}(1P) \to \gamma J/\psi(1S)) = (1.27 \pm 0.06) \times 10^{-2}$, which we rescale to our best value $B(\chi_{c0}(1P) \to \gamma J/\psi(1S)) = (1.40 \pm 0.05) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma\left(e^+ e^- \chi_{c0}(1P)\right)/\Gamma\left(\gamma \chi_{c0}(1P)\right)$ $\qquad$ $\Gamma_{206}/\Gamma_{162}$

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
9.4±1.9±0.6	48	[1] ABLIKIM	17I	BES3	$\psi(2S) \to e^+ e^- \gamma J/\psi$

[1] Uses $B(\psi(2S) \to \gamma \chi_{c0}(1P)) \times B(\chi_{c0}(1P) \to \gamma J/\psi(1S)) = (15.8 \pm 0.3 \pm 0.6) \times 10^{-4}$ from ABLIKIM 17N and accounts for common systematic errors.

$\Gamma\left(e^+ e^- \chi_{c1}(1P)\right)/\Gamma_{\text{total}}$ $\qquad$ Γ_{207}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
8.5±0.6±0.2	873	[1] ABLIKIM	17I	BES3	$\psi(2S) \to e^+ e^- \gamma J/\psi$

[1] ABLIKIM 17I reports $(8.6 \pm 0.3 \pm 0.6) \times 10^{-4}$ from a measurement of $[\Gamma(\psi(2S) \to e^+ e^- \chi_{c1}(1P))/\Gamma_{\text{total}}] \times [B(\chi_{c1}(1P) \to \gamma J/\psi(1S))]$ assuming $B(\chi_{c1}(1P) \to \gamma J/\psi(1S)) = (33.9 \pm 1.2) \times 10^{-2}$, which we rescale to our best value $B(\chi_{c1}(1P) \to \gamma J/\psi(1S)) = (34.3 \pm 1.0) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma\left(e^+ e^- \chi_{c1}(1P)\right)/\Gamma\left(\gamma \chi_{c1}(1P)\right)$ $\qquad$ $\Gamma_{207}/\Gamma_{163}$

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
8.3±0.3±0.4	873	[1] ABLIKIM	17I	BES3	$\psi(2S) \to e^+ e^- \gamma J/\psi$

[1] Uses $B(\psi(2S) \to \gamma \chi_{c1}(1P)) \times B(\chi_{c1}(1P) \to \gamma J/\psi(1S)) = (351.8 \pm 1.0 \pm 12.0) \times 10^{-4}$ from ABLIKIM 17N and accounts for common systematic errors.

$\Gamma\left(e^+ e^- \chi_{c2}(1P)\right)/\Gamma_{\text{total}}$ $\qquad$ Γ_{208}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
7.0±0.7±0.2	227	[1] ABLIKIM	17I	BES3	$\psi(2S) \to e^+ e^- \gamma J/\psi$

[1] ABLIKIM 17I reports $(6.9 \pm 0.5 \pm 0.6) \times 10^{-4}$ from a measurement of $[\Gamma(\psi(2S) \to e^+ e^- \chi_{c2}(1P))/\Gamma_{\text{total}}] \times [B(\chi_{c2}(1P) \to \gamma J/\psi(1S))]$ assuming $B(\chi_{c2}(1P) \to \gamma J/\psi(1S)) = (19.2 \pm 0.7) \times 10^{-2}$, which we rescale to our best value $B(\chi_{c2}(1P) \to \gamma J/\psi(1S)) = (19.0 \pm 0.5) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma\left(e^+ e^- \chi_{c2}(1P)\right)/\Gamma\left(\gamma \chi_{c2}(1P)\right)$ $\qquad$ $\Gamma_{208}/\Gamma_{164}$

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
6.6±0.5±0.4	227	[1] ABLIKIM	17I	BES3	$\psi(2S) \to e^+ e^- \gamma J/\psi$

[1] Uses $B(\psi(2S) \to \gamma \chi_{c2}(1P)) \times B(\chi_{c2}(1P) \to \gamma J/\psi(1S)) = (199.6 \pm 0.8 \pm 7.0) \times 10^{-4}$ from ABLIKIM 17N and accounts for common systematic errors.

—— WEAK DECAYS ——

$\Gamma(D^0 e^+ e^- + \text{c.c.})/\Gamma_{\text{total}}$ $\qquad$ Γ_{209}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<1.4 \times 10^{-7}$	90	[1] ABLIKIM	17AF	BES3	$e^+ e^- \to \psi(2S)$

[1] Using D^0 decays to $K^- \pi^+$, $K^- \pi^+ \pi^0$, and $K^- \pi^+ \pi^+ \pi^-$.

—— OTHER DECAYS ——

$\Gamma(\text{invisible})/\Gamma(e^+ e^-)$ $\qquad$ Γ_{210}/Γ_7

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<2.0	90	LEES	13I	BABR	$B \to K^{(*)} \psi(2S)$

$\psi(2S)$ CROSS-PARTICLE BRANCHING RATIOS

For measurements involving $B(\psi(2S) \to \gamma \chi_{cJ}(1P)) \times B(\chi_{cJ}(1P) \to X)$
see the corresponding entries in the $\chi_{cJ}(1P)$ sections.

MULTIPOLE AMPLITUDE RATIOS IN RADIATIVE DECAYS
$\psi(2S) \to \gamma \chi_{cJ}(1P)$ and $\chi_{cJ} \to \gamma J/\psi(1S)$

$a_2(\chi_{c1})/a_2(\chi_{c2})$ Magnetic quadrupole transition amplitude ratio

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
63 ± 7 OUR AVERAGE					
61.7 ± 8.3	253k	[1] ABLIKIM	17N	BES3	$\psi(2S) \to \gamma\gamma \ell^+ \ell^-$
$67 \, {}^{+19}_{-13}$	59k	[2] ARTUSO	09	CLEO	$\psi(2S) \to \gamma\gamma \ell^+ \ell^-$

[1] Statistical and systematic errors combined.
[2] Statistical and systematic errors combined. Using values from fits with floating *M2* amplitudes $a_2(\chi_{c1})$, $a_2(\chi_{c2})$, $b_2(\chi_{c1})$, $b_2(\chi_{c2})$ and fixed *E3* amplitudes of $a_3(\chi_{c2})$ = $b_3(\chi_{c2})$ = 0. Not independent of values for $a_2(\chi_{c1}(1P))$ and $a_2(\chi_{c2}(1P))$ from ARTUSO 09.

$b_2(\chi_{c2})/b_2(\chi_{c1})$ Magnetic quadrupole transition amplitude ratio

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
60 ± 31 OUR AVERAGE					
74 ± 40	253k	[1] ABLIKIM	17N	BES3	$\psi(2S) \to \gamma\gamma \ell^+ \ell^-$
$37 \, {}^{+53}_{-47}$	59k	[2] ARTUSO	09	CLEO	$\psi(2S) \to \gamma\gamma \ell^+ \ell^-$

[1] Statistical and systematic errors combined. Derived from the reported measurement of $b_2(\chi_{c1})/b_2(\chi_{c2}) = 1.35 \pm 0.72$.
[2] Statistical and systematic errors combined. Using values from fits with floating *M2* amplitudes $a_2(\chi_{c1})$, $a_2(\chi_{c2})$, $b_2(\chi_{c1})$, $b_2(\chi_{c2})$ and fixed *E3* amplitudes of $a_3(\chi_{c2})$ = $b_3(\chi_{c2})$ = 0. Not independent of values for $b_2(\chi_{c1}(1P))$ and $b_2(\chi_{c2}(1P))$ from ARTUSO 09.

$\psi(2S)$ REFERENCES

ABLIKIM	21AL	PR D104 092003	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	21AO	PR D104 092012	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	21AT	JHEP 2111 226	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	21E	PRL 126 092002	M. Ablikim *et al.*	(BESIII Collab.)

ABLIKIM	21L	PR D103 112004	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	21S	PL B820 136576	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	21Z	PRL 127 082002	M. Ablikim *et al.*	(BESIII Collab.)
LEES	21	PR D103 092001	J.P. Lees *et al.*	(BABAR Collab.)
LEES	21C	PR D104 112004	J.P. Lees *et al.*	(BABAR Collab.)
ABLIKIM	20F	PR D101 032008	M. Ablikim *et al.*	(BESIII Collab.)
PDG	20	PTEP 2020 083C01	P.A. Zyla *et al.*	(PDG Collab.)
ABLIKIM	19AO	PR D99 112010	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	19AT	PR D100 051101	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	19AU	PR D100 052010	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	19BA	PR D100 092003	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	19I	PR D99 012014	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	19N	PR D99 032006	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	18Q	PR D97 091102	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	18T	PR D98 032006	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	18Z	PL B783 452	M. Ablikim *et al.*	(BESIII Collab.)
ANASHIN	18	PL B781 174	V.V. Anashin *et al.*	(KEDR Collab.)
LEES	18E	PR D98 112015	J.P. Lees *et al.*	(BABAR Collab.)
ABLIKIM	17AF	PR D96 111101	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	17AJ	PR D96 112008	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	17AK	PR D96 112012	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	17E	PL B770 217	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	17I	PRL 118 221802	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	17L	PR D95 052003	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	17N	PR D95 072004	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	17U	PR D96 032001	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	17X	PR D96 052003	M. Ablikim *et al.*	(BESIII Collab.)
DOBBS	17	PR D96 092004	S. Dobbs *et al.*	(NWES, WAYN)
LEES	17A	PR D95 052001	J.P. Lees *et al.*	(BABAR Collab.)
AAIJ	16Y	JHEP 1605 132	R. Aaij *et al.*	(LHCb Collab.)
ABLIKIM	16L	PR D93 072003	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	15I	PR D91 092006	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	15V	PL B749 414	M. Ablikim *et al.*	(BESIII Collab.)
ANASHIN	15	PL B749 50	V.V. Anashin *et al.*	(KEDR Collab.)
DOBBS	15	PR D91 052006	S. Dobbs *et al.*	(NWES)
LEES	15J	PR D92 072008	J.P. Lees *et al.*	(BABAR Collab.)
ABLIKIM	14G	PR D89 112006	M. Ablikim *et al.*	(BESIII Collab.)
DOBBS	14	PL B739 90	S. Dobbs *et al.*	(NWES, WAYN)
ABLIKIM	13A	PRL 110 022001	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	13D	PR D87 012007	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	13F	PR D87 052007	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	13M	PR D87 092006	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	13R	PR D88 032007	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	13S	PR D88 032010	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	13W	PR D88 112007	M. Ablikim *et al.*	(BESIII Collab.)
LEES	13I	PR D87 112005	J.P. Lees *et al.*	(BABAR Collab.)
LEES	13O	PR D87 092005	J.P. Lees *et al.*	(BABAR Collab.)
LEES	13Q	PR D88 032013	J.P. Lees *et al.*	(BABAR Collab.)
LEES	13Y	PR D88 072009	J.P. Lees *et al.*	(BABAR Collab.)
AAIJ	12H	EPJ C72 1972	R. Aaij *et al.*	(LHCb Collab.)
ABLIKIM	12D	PRL 108 112003	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	12G	PRL 109 042003	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	12H	PL B710 594	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	12L	PR D86 072011	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	12M	PR D86 092008	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	12O	PRL 109 172002	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	12Q	CP C36 1040	M. Ablikim *et al.*	(BES II Collab.)
ANASHIN	12	PL B711 280	V.V. Anashin *et al.*	(KEDR Collab.)
LEES	12E	PR D85 112009	J.P. Lees *et al.*	(BABAR Collab.)
LEES	12F	PR D86 012008	J.P. Lees *et al.*	(BABAR Collab.)
METREVELI	12	PR D85 092007	Z. Metreveli *et al.*	(NWES, FLOR, WAYN+)
GE	11	PR D84 032008	J.Y. Ge *et al.*	(CLEO Collab.)
ABLIKIM	10B	PRL 104 132002	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	10F	PRL 105 261801	M. Ablikim *et al.*	(BESIII Collab.)
ALEXANDER	10	PR D82 092002	J.P. Alexander *et al.*	(CLEO Collab.)
CRONIN-HEN...	10	PR D81 052002	D. Cronin-Hennessey *et al.*	(CLEO Collab.)
ADAMS	09	PR D80 051106	G.S. Adams *et al.*	(CLEO Collab.)
ARTUSO	09	PR D80 112003	M. Artuso *et al.*	(CLEO Collab.)
LIBBY	09	PR D80 072002	J. Libby *et al.*	(CLEO Collab.)
MITCHELL	09	PRL 102 011801	R.E. Mitchell *et al.*	(CLEO Collab.)
PEDLAR	09	PR D79 111101	T.K. Pedlar *et al.*	(CLEO Collab.)

ABLIKIM	08B	PL B659 74	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	08C	PL B659 789	M. Ablikim *et al.*	(BES Collab.)
DOBBS	08A	PRL 101 182003	S. Dobbs *et al.*	(CLEO Collab.)
MENDEZ	08	PR D78 011102	H. Mendez *et al.*	(CLEO Collab.)
PDG	08	PL B667 1	C. Amsler *et al.*	(PDG Collab.)
ABLIKIM	07C	PL B648 149	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	07D	PRL 99 011802	M. Ablikim *et al.*	(BES II Collab.)
ABLIKIM	07H	PR D76 092003	M. Ablikim *et al.*	(BES Collab.)
ANASHIN	07	JETPL 85 347	V.V. Anashin *et al.*	(KEDR Collab.)
		Translated from ZETFP 85 429.		
ANDREOTTI	07	PL B654 74	M. Andreotti *et al.*	(Femilab E835 Collab.)
AUBERT	07AK	PR D76 012008	B. Aubert *et al.*	(BABAR Collab.)
AUBERT	07AU	PR D76 092005	B. Aubert *et al.*	(BABAR Collab.)
Also		PR D77 119902E (errat.)	B. Aubert *et al.*	(BABAR Collab.)
AUBERT	07BD	PR D76 092006	B. Aubert *et al.*	(BABAR Collab.)
PDG	07	Unofficial 2007 WWW edition		(PDG Collab.)
PEDLAR	07	PR D75 011102	T.K. Pedlar *et al.*	(CLEO Collab.)
ABLIKIM	06G	PR D73 052004	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	06I	PR D74 012004	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	06L	PRL 97 121801	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	06R	PR D74 072001	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	06W	PR D74 112003	M. Ablikim *et al.*	(BES Collab.)
ADAM	06	PRL 96 082004	N.E. Adam *et al.*	(CLEO Collab.)
AUBERT	06B	PR D73 012005	B. Aubert *et al.*	(BABAR Collab.)
AUBERT	06D	PR D73 052003	B. Aubert *et al.*	(BABAR Collab.)
AUBERT,BE	06D	PR D74 091103	B. Aubert *et al.*	(BABAR Collab.)
DOBBS	06A	PR D74 011105	S. Dobbs *et al.*	(CLEO Collab.)
ABLIKIM	05E	PR D71 072006	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	05H	PR D72 012002	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	05I	PL B614 37	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	05J	PL B619 247	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	05O	PL B630 21	M. Ablikim *et al.*	(BES Collab.)
ADAM	05	PRL 94 012005	N.E. Adam *et al.*	(CLEO Collab.)
ADAM	05A	PRL 94 232002	N.E. Adam *et al.*	(CLEO Collab.)
ANDREOTTI	05	PR D71 032006	M. Andreotti *et al.*	(FNAL E835 Collab.)
AUBERT	05D	PR D71 052001	B. Aubert *et al.*	(BABAR Collab.)
BRIERE	05	PRL 95 062001	R.A. Briere *et al.*	(CLEO Collab.)
PEDLAR	05	PR D72 051108	T.K. Pedlar *et al.*	(CLEO Collab.)
ROSNER	05	PRL 95 102003	J.L. Rosner *et al.*	(CLEO Collab.)
ABLIKIM	04B	PR D70 012003	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	04K	PR D70 112003	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	04L	PR D70 112007	M. Ablikim *et al.*	(BES Collab.)
ATHAR	04	PR D70 112002	S.B. Athar *et al.*	(CLEO Collab.)
BAI	04B	PRL 92 052001	J.Z. Bai *et al.*	(BES Collab.)
BAI	04C	PR D69 072001	J.Z. Bai *et al.*	(BES Collab.)
BAI	04D	PL B589 7	J.Z. Bai *et al.*	(BES Collab.)
BAI	04G	PR D70 012004	J.Z. Bai *et al.*	(BES Collab.)
BAI	04I	PR D70 012006	J.Z. Bai *et al.*	(BES Collab.)
PDG	04	PL B592 1	S. Eidelman *et al.*	(PDG Collab.)
SETH	04	PR D69 097503	K.K. Seth	
AULCHENKO	03	PL B573 63	V.M. Aulchenko *et al.*	(KEDR Collab.)
BAI	03B	PR D67 052002	J.Z. Bai *et al.*	(BES Collab.)
BAI	03C	PR D67 032004	J.Z. Bai *et al.*	(BES Collab.)
AUBERT	02B	PR D65 031101	B. Aubert *et al.*	(BABAR Collab.)
BAI	02	PR D65 052004	J.Z. Bai *et al.*	(BES Collab.)
BAI	02B	PL B550 24	J.Z. Bai *et al.*	(BES Collab.)
BAI	02C	PRL 88 101802	J.Z. Bai *et al.*	(BES Collab.)
PDG	02	PR D66 010001	K. Hagiwara *et al.*	(PDG Collab.)
BAI	01	PR D63 032002	J.Z. Bai *et al.*	(BES Collab.)
AMBROGIANI	00A	PR D62 032004	M. Ambrogiani *et al.*	(FNAL E835 Collab.)
ARTAMONOV	00	PL B474 427	A.S. Artamonov *et al.*	
BAI	00	PRL 84 594	J.Z. Bai *et al.*	(BES Collab.)
BAI	99C	PRL 83 1918	J.Z. Bai *et al.*	(BES Collab.)
BAI	98E	PR D57 3854	J.Z. Bai *et al.*	(BES Collab.)
BAI	98F	PR D58 097101	J.Z. Bai *et al.*	(BES Collab.)
BAI	98J	PRL 81 5080	J.Z. Bai *et al.*	(BES Collab.)
ARMSTRONG	97	PR D55 1153	T.A. Armstrong *et al.*	(E760 Collab.)
GRIBUSHIN	96	PR D53 4723	A. Gribushin *et al.*	(E672 and E706 Collab.)
ARMSTRONG	93B	PR D47 772	T.A. Armstrong *et al.*	(FNAL E760 Collab.)
ALEXANDER	89	NP B320 45	J.P. Alexander *et al.*	(LBL, MICH, SLAC)
COHEN	87	RMP 59 1121	E.R. Cohen, B.N. Taylor	(RISC, NBS)

GAISER	86	PR D34 711	J. Gaiser *et al.*	(Crystal Ball Collab.)
KURAEV	85	SJNP 41 466	E.A. Kuraev, V.S. Fadin	(NOVO)
		Translated from YAF 41 733.		
FRANKLIN	83	PRL 51 963	M.E.B. Franklin *et al.*	(LBL, SLAC)
EDWARDS	82C	PRL 48 70	C. Edwards *et al.*	(CIT, HARV, PRIN+)
LEMOIGNE	82	PL 113B 509	Y. Lemoigne *et al.*	(SACL, LOIC, SHMP+)
HIMEL	80	PRL 44 920	T. Himel *et al.*	(LBL, SLAC)
OREGLIA	80	PRL 45 959	M.J. Oreglia *et al.*	(SLAC, CIT, HARV+)
SCHARRE	80	PL 97B 329	D.L. Scharre *et al.*	(SLAC, LBL)
ZHOLENTZ	80	PL 96B 214	A.A. Zholents *et al.*	(NOVO)
Also		SJNP 34 814	A.A. Zholents *et al.*	(NOVO)
		Translated from YAF 34 1471.		
BRANDELIK	79B	NP B160 426	R. Brandelik *et al.*	(DASP Collab.)
BRANDELIK	79C	ZPHY C1 233	R. Brandelik *et al.*	(DASP Collab.)
BARTEL	78B	PL 79B 492	W. Bartel *et al.*	(DESY, HEIDP)
TANENBAUM	78	PR D17 1731	W.M. Tanenbaum *et al.*	(SLAC, LBL)
BIDDICK	77	PRL 38 1324	C.J. Biddick *et al.*	(UCSD, UMD, PAVI+)
BRAUNSCH...	77	PL 67B 249	W. Braunschweig *et al.*	(DASP Collab.)
BURMESTER	77	PL 66B 395	J. Burmester *et al.*	(DESY, HAMB, SIEG+)
FELDMAN	77	PRPL 33C 285	G.J. Feldman, M.L. Perl	(LBL, SLAC)
YAMADA	77	Hamburg Conf. 69	S. Yamada	(DASP Collab.)
BARTEL	76	PL 64B 483	W. Bartel *et al.*	(DESY, HEIDP)
TANENBAUM	76	PRL 36 402	W.M. Tanenbaum *et al.*	(SLAC, LBL) IG
WHITAKER	76	PRL 37 1596	J.S. Whitaker *et al.*	(SLAC, LBL)
ABRAMS	75	Stanford Symp. 25	G.S. Abrams	(LBL)
ABRAMS	75B	PRL 34 1181	G.S. Abrams *et al.*	(LBL, SLAC)
BOYARSKI	75C	Palermo Conf. 54	A.M. Boyarski *et al.*	(SLAC, LBL)
HILGER	75	PRL 35 625	E. Hilger *et al.*	(STAN, PENN)
LIBERMAN	75	Stanford Symp. 55	A.D. Liberman	(STAN)
LUTH	75	PRL 35 1124	V. Luth *et al.*	(SLAC, LBL) JPC
WIIK	75	Stanford Symp. 69	B.H. Wiik	(DESY)