$\psi(2S)$

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

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. • • •					
$3686.114\pm0.007^{+0.011}_{-0.016}$		[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[5] Superseded by ARTAMONOV 00.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. • • •				
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^0_S anything	(16.0 ± 1.1) %	
Γ_7	e^+e^-	$(7.93 \pm 0.17) \times 10^{-3}$	
Γ_8	$\mu^+\mu^-$	$(8.0 \pm 0.6) \times 10^{-3}$	
Γ_9	$\tau^+\tau^-$	$(3.1 \pm 0.4) \times 10^{-3}$	
	Decays into $J/\psi(1S)$ and anything		
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}	$J/\psi(1S)\pi^0$	$(1.268 \pm 0.032) \times 10^{-3}$	
	Hadronic decays		
Γ_{16}	$\pi^+\pi^-$	$(7.8 \pm 2.6) \times 10^{-6}$	
Γ_{17}	$\pi^+\pi^-\pi^0$	$(2.01 \pm 0.17) \times 10^{-4}$	S=1.7
Γ_{18}	$\rho(770)\pi \to \pi^+\pi^-\pi^0$	$(3.2 \pm 1.2) \times 10^{-5}$	S=1.8
Γ_{19}	$\rho(2150)\pi \to \pi^+\pi^-\pi^0$	$(1.9 {}^{+1.2}_{-0.4}) \times 10^{-4}$	
Γ_{20}	$2(\pi^+\pi^-)$	$(2.4 \pm 0.6) \times 10^{-4}$	S=2.2
Γ_{21}	$\rho^0\pi^+\pi^-$	$(2.2 \pm 0.6) \times 10^{-4}$	S=1.4
Γ_{22}	$2(\pi^+\pi^-)\pi^0$	$(2.9 \pm 1.0) \times 10^{-3}$	S=4.7
Γ_{23}	$\rho a_2(1320)$	$(2.6 \pm 0.9) \times 10^{-4}$	
Γ_{24}	$\pi^+\pi^-\pi^0\pi^0\pi^0$	$(5.3 \pm 0.9) \times 10^{-3}$	

Γ_{25}	$\pi^+\pi^-4\pi^0$	$(1.4 \pm 1.0) \times 10^{-3}$		
Γ_{26}	$\rho^\pm\pi^\mp\pi^0\pi^0$	$< 2.7 \times 10^{-3}$	CL=90%	
Γ_{27}	$3(\pi^+\pi^-)$	$(3.5 \pm 2.0) \times 10^{-4}$		S=2.8
Γ_{28}	$2(\pi^+\pi^-\pi^0)$	$(4.8 \pm 1.5) \times 10^{-3}$		
Γ_{29}	$3(\pi^+\pi^-)\pi^0$	$(3.5 \pm 1.6) \times 10^{-3}$		
Γ_{30}	$2(\pi^+\pi^-)3\pi^0$	(1.42 ± 0.31) %		
Γ_{31}	$\eta\pi^+\pi^-$	$< 1.6 \times 10^{-4}$	CL=90%	
Γ_{32}	$\eta\pi^+\pi^-\pi^0$	$(9.5 \pm 1.7) \times 10^{-4}$		
Γ_{33}	$\eta 2(\pi^+\pi^-)$	$(1.2 \pm 0.6) \times 10^{-3}$		
Γ_{34}	$\eta\pi^+\pi^-\pi^0\pi^0$	$< 4 \times 10^{-4}$	CL=90%	
Γ_{35}	$\eta\pi^+\pi^-3\pi^0$	$< 2.1 \times 10^{-3}$	CL=90%	
Γ_{36}	$\eta 2(\pi^+\pi^-\pi^0)$	$< 2.1 \times 10^{-3}$	CL=90%	
Γ_{37}	$\rho\eta$	$(2.2 \pm 0.6) \times 10^{-5}$		S=1.1
Γ_{38}	$\eta'\pi^+\pi^-\pi^0$	$(4.5 \pm 2.1) \times 10^{-4}$		
Γ_{39}	$\eta'\rho$	$(1.9 {}^{+1.7}_{-1.2}) \times 10^{-5}$		
Γ_{40}	$\omega\pi^0$	$(2.1 \pm 0.6) \times 10^{-5}$		
Γ_{41}	$\omega\pi^+\pi^-$	$(7.3 \pm 1.2) \times 10^{-4}$		S=2.1
Γ_{42}	$\omega\pi^+\pi^-2\pi^0$	$(8.7 \pm 2.4) \times 10^{-3}$		
Γ_{43}	$b_1^\pm\pi^\mp$	$(4.0 \pm 0.6) \times 10^{-4}$		S=1.1
Γ_{44}	$\omega f_2(1270)$	$(2.2 \pm 0.4) \times 10^{-4}$		
Γ_{45}	$\omega\pi^0\pi^0$	$(1.11 \pm 0.35) \times 10^{-3}$		
Γ_{46}	$\omega 3\pi^0$	$< 8 \times 10^{-4}$	CL=90%	
Γ_{47}	$b_1^0\pi^0$	$(2.4 \pm 0.6) \times 10^{-4}$		
Γ_{48}	$\omega\eta$	$< 1.1 \times 10^{-5}$	CL=90%	
Γ_{49}	$\omega\eta'$	$(3.2 {}^{+2.5}_{-2.1}) \times 10^{-5}$		
Γ_{50}	$\phi\pi^0$	$< 4 \times 10^{-7}$	CL=90%	
Γ_{51}	$\phi\pi^+\pi^-$	$(1.18 \pm 0.26) \times 10^{-4}$		S=1.5
Γ_{52}	$\phi f_0(980) \to \pi^+\pi^-$	$(7.5 \pm 3.3) \times 10^{-5}$		S=1.6
Γ_{53}	$\phi\eta$	$(3.10 \pm 0.31) \times 10^{-5}$		
Γ_{54}	$\eta\phi(2170),\ \phi(2170) \to \phi f_0(980),\ f_0 \to \pi^+\pi^-$	$< 2.2 \times 10^{-6}$	CL=90%	
Γ_{55}	$\phi\eta'$	$(1.54 \pm 0.20) \times 10^{-5}$		
Γ_{56}	$\phi f_1(1285)$	$(3.0 \pm 1.3) \times 10^{-5}$		
Γ_{57}	$\phi\eta(1405) \to \phi\pi^+\pi^-\eta$	$(8.5 \pm 1.7) \times 10^{-6}$		
Γ_{58}	$\phi f_2'(1525)$	$(4.4 \pm 1.6) \times 10^{-5}$		
Γ_{59}	K^+K^-	$(7.5 \pm 0.5) \times 10^{-5}$		
Γ_{60}	$K^+K^-\pi^+$	$(7.3 \pm 0.5) \times 10^{-4}$		
Γ_{61}	$K^+K^-\pi^0$	$(4.07 \pm 0.31) \times 10^{-5}$		
Γ_{62}	$K_S^0K_S^0$	$< 4.6 \times 10^{-6}$		
Γ_{63}	$K_S^0K_L^0$	$(5.34 \pm 0.33) \times 10^{-5}$		
Γ_{64}	$K_S^0K_L^0\pi^0$	$< 3.0 \times 10^{-4}$	CL=90%	
Γ_{65}	$K^+K^-\pi^0\pi^0$	$(2.6 \pm 1.3) \times 10^{-4}$		

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. $\to$ $p\overline{p}\pi^0$	$(6.4\ ^{+2.3}_{-1.8}) \times 10^{-6}$	
Γ_{107}	$N(1535)\overline{p}+$ c.c. $\to$ $p\overline{p}\pi^0$	$(2.5\ \pm1.0) \times 10^{-5}$	
Γ_{108}	$N(1650)\overline{p}+$ c.c. $\to$ $p\overline{p}\pi^0$	$(3.8\ ^{+1.4}_{-1.7}) \times 10^{-5}$	
Γ_{109}	$N(1720)\overline{p}+$ c.c. $\to$ $p\overline{p}\pi^0$	$(1.79\ ^{+0.26}_{-0.70}) \times 10^{-5}$	
Γ_{110}	$N(2300)\overline{p}+$ c.c. $\to$ $p\overline{p}\pi^0$	$(2.6\ ^{+1.2}_{-0.7}) \times 10^{-5}$	
Γ_{111}	$N(2570)\overline{p}+$ c.c. $\to$ $p\overline{p}\pi^0$	$(2.13\ ^{+0.40}_{-0.31}) \times 10^{-5}$	
Γ_{112}	$p\overline{p}\pi^+\pi^-$	$(6.0\ \pm0.4) \times 10^{-4}$	
Γ_{113}	$p\overline{p}K^+K^-$	$(2.7\ \pm0.7) \times 10^{-5}$	
Γ_{114}	$p\overline{p}\eta$	$(6.0\ \pm0.4) \times 10^{-5}$	
Γ_{115}	$N(1535)\overline{p}+$ c.c. $\to$ $p\overline{p}\eta$	$(4.5\ ^{+0.7}_{-0.6}) \times 10^{-5}$	
Γ_{116}	$p\overline{p}\pi^+\pi^-\pi^0$	$(7.3\ \pm0.7) \times 10^{-4}$	
Γ_{117}	$p\overline{p}\rho^0$	$(5.0\ \pm2.2) \times 10^{-5}$	
Γ_{118}	$p\overline{p}\omega$	$(6.9\ \pm2.1) \times 10^{-5}$	
Γ_{119}	$p\overline{p}\eta'$	$(1.10\ \pm0.13) \times 10^{-5}$	
Γ_{120}	$p\overline{p}\phi$	$(6.1\ \pm0.6) \times 10^{-6}$	
Γ_{121}	$\phi X(1835) \to$ $p\overline{p}\phi$	$< 1.82 \times 10^{-7}$	CL=90%
Γ_{122}	$p\overline{n}\pi^-$ or c.c.	$(2.48\ \pm0.17) \times 10^{-4}$	
Γ_{123}	$p\overline{n}\pi^-\pi^0$	$(3.2\ \pm0.7) \times 10^{-4}$	
Γ_{124}	$\Lambda\overline{\Lambda}$	$(3.81\ \pm0.13) \times 10^{-4}$	S=1.4
Γ_{125}	$\Lambda\overline{\Lambda}\pi^0$	$(1.4\ \pm0.7) \times 10^{-6}$	
Γ_{126}	$\Lambda\overline{\Lambda}\eta$	$(2.43\ \pm0.32) \times 10^{-5}$	
Γ_{127}	$\Lambda(1670)\overline{\Lambda} \to$ $\Lambda\overline{\Lambda}\eta$	$(1.3\ \pm0.7) \times 10^{-5}$	
Γ_{128}	$\Lambda\overline{\Lambda}\omega(782)$	$(3.3\ \pm0.4) \times 10^{-5}$	
Γ_{129}	$\Lambda\overline{\Lambda}\pi^+\pi^-$	$(2.8\ \pm0.6) \times 10^{-4}$	
Γ_{130}	$\Lambda\overline{p}K^+$	$(1.00\ \pm0.14) \times 10^{-4}$	
Γ_{131}	$\Lambda\overline{p}K^*(892)^+ +$ c.c.	$(6.3\ \pm0.7) \times 10^{-5}$	
Γ_{132}	$\Lambda\overline{p}K^+\pi^+\pi^-$	$(1.8\ \pm0.4) \times 10^{-4}$	
Γ_{133}	$\overline{\Lambda}nK^0_S +$ c.c.	$(8.1\ \pm1.8) \times 10^{-5}$	
Γ_{134}	$\Delta^{++}\overline{\Delta}^{--}$	$(1.28\ \pm0.35) \times 10^{-4}$	
Γ_{135}	$\Lambda\overline{\Sigma}^+\pi^- +$ c.c.	$(1.40\ \pm0.13) \times 10^{-4}$	
Γ_{136}	$\Lambda\overline{\Sigma}^-\pi^+ +$ c.c.	$(1.54\ \pm0.14) \times 10^{-4}$	
Γ_{137}	$\Lambda\overline{\Sigma}^0 +$ c.c.	$(1.6\ \pm0.7) \times 10^{-6}$	
Γ_{138}	$\Lambda\overline{\Sigma}^0$		
Γ_{139}	$\Sigma^0\overline{p}K^+ +$ c.c.	$(1.67\ \pm0.18) \times 10^{-5}$	
Γ_{140}	$\Sigma^+\overline{\Sigma}^-$	$(2.43\ \pm0.10) \times 10^{-4}$	S=1.4
Γ_{141}	$\Sigma^0\overline{\Sigma}^0$	$(2.35\ \pm0.09) \times 10^{-4}$	S=1.1
Γ_{142}	$\Sigma^-\overline{\Sigma}^+$	$(2.82\ \pm0.09) \times 10^{-4}$	
Γ_{143}	$\Sigma^+\overline{\Sigma}^-\eta$	$(9.6\ \pm2.4) \times 10^{-6}$	
Γ_{144}	$\Sigma(1385)^+\overline{\Sigma}(1385)^-$	$(8.5\ \pm0.7) \times 10^{-5}$	
Γ_{145}	$\Sigma(1385)^-\overline{\Sigma}(1385)^+$	$(8.5\ \pm0.8) \times 10^{-5}$	
Γ_{146}	$\Sigma(1385)^0\overline{\Sigma}(1385)^0$	$(6.9\ \pm0.7) \times 10^{-5}$	

Γ_{147}	$\Xi^- \overline{\Xi}^+$		$(2.87 \pm 0.11) \times 10^{-4}$	S=1.1
Γ_{148}	$\Xi^0 \overline{\Xi}^0$		$(2.3 \pm 0.4) \times 10^{-4}$	S=4.2
Γ_{149}	$\Xi(1530)^0 \overline{\Xi}(1530)^0$		$(6.8 \pm 0.4) \times 10^{-5}$	
Γ_{150}	$\Lambda \overline{\Xi}^+ K^- +$ c.c.		$(3.9 \pm 0.4) \times 10^{-5}$	
Γ_{151}	$\Xi(1530)^- \overline{\Xi}(1530)^+$		$(1.15 \pm 0.07) \times 10^{-4}$	
Γ_{152}	$\Xi(1530)^- \overline{\Xi}^+$		$(7.0 \pm 1.2) \times 10^{-6}$	
Γ_{153}	$\Xi(1530)^0 \overline{\Xi}^0$		$(5.3 \pm 0.5) \times 10^{-6}$	
Γ_{154}	$\Xi(1690)^- \overline{\Xi}^+ \to K^- \Lambda \overline{\Xi}^+ +$ c.c.		$(5.2 \pm 1.6) \times 10^{-6}$	
Γ_{155}	$\Xi(1820)^- \overline{\Xi}^+ \to K^- \Lambda \overline{\Xi}^+ +$ c.c.		$(1.20 \pm 0.32) \times 10^{-5}$	
Γ_{156}	$\Sigma^0 \overline{\Xi}^+ K^- +$ c.c.		$(3.7 \pm 0.4) \times 10^{-5}$	
Γ_{157}	$\Omega^- \overline{\Omega}^+$		$(5.66 \pm 0.30) \times 10^{-5}$	S=1.3
Γ_{158}	$\eta_c \pi^+ \pi^- \pi^0$		$< 1.0 \times 10^{-3}$	CL=90%
Γ_{159}	$h_c(1P) \pi^0$		$(7.4 \pm 0.5) \times 10^{-4}$	
Γ_{160}	$\Lambda_c^+ \overline{p} e^+ e^- +$ c.c.		$< 1.7 \times 10^{-6}$	CL=90%
Γ_{161}	$\Theta(1540) \overline{\Theta}(1540) \to K_S^0 p K^- \overline{n} +$ c.c.	[a]	$< 8.8 \times 10^{-6}$	CL=90%
Γ_{162}	$\Theta(1540) K^- \overline{n} \to K_S^0 p K^- \overline{n}$	[a]	$< 1.0 \times 10^{-5}$	CL=90%
Γ_{163}	$\Theta(1540) K_S^0 \overline{p} \to K_S^0 \overline{p} K^+ n$	[a]	$< 7.0 \times 10^{-6}$	CL=90%
Γ_{164}	$\overline{\Theta}(1540) K^+ n \to K_S^0 \overline{p} K^+ n$	[a]	$< 2.6 \times 10^{-5}$	CL=90%
Γ_{165}	$\overline{\Theta}(1540) K_S^0 p \to K_S^0 p K^- \overline{n}$	[a]	$< 6.0 \times 10^{-6}$	CL=90%

Radiative decays

Γ_{166}	$\gamma \chi_{c0}(1P)$	(9.79 ± 0.20) %	
Γ_{167}	$\gamma \chi_{c1}(1P)$	(9.75 ± 0.24) %	
Γ_{168}	$\gamma \chi_{c2}(1P)$	(9.52 ± 0.20) %	
Γ_{169}	$\gamma \eta_c(1S)$	$(3.4 \pm 0.5) \times 10^{-3}$	S=1.3
Γ_{170}	$\gamma \eta_c(2S)$	$(7 \pm 5) \times 10^{-4}$	
Γ_{171}	$\gamma \pi^0$	$(1.04 \pm 0.22) \times 10^{-6}$	S=1.4
Γ_{172}	$\gamma 2(\pi^+ \pi^-)$	$(4.0 \pm 0.6) \times 10^{-4}$	
Γ_{173}	$\gamma 3(\pi^+ \pi^-)$	$< 1.7 \times 10^{-4}$	CL=90%
Γ_{174}	$\gamma \eta'(958)$	$(1.24 \pm 0.04) \times 10^{-4}$	
Γ_{175}	$\gamma f_2(1270)$	$(2.73 {}^{+0.29}_{-0.25}) \times 10^{-4}$	S=1.8
Γ_{176}	$\gamma f_0(1370) \to \gamma K \overline{K}$	$(3.1 \pm 1.7) \times 10^{-5}$	
Γ_{177}	$\gamma f_0(1500)$	$(9.3 \pm 1.9) \times 10^{-5}$	
Γ_{178}	$\gamma f'_2(1525)$	$(3.3 \pm 0.8) \times 10^{-5}$	
Γ_{179}	$\gamma f_0(1710)$		
Γ_{180}	$\gamma f_0(1710) \to \gamma \pi \pi$	$(3.5 \pm 0.6) \times 10^{-5}$	
Γ_{181}	$\gamma f_0(1710) \to \gamma K \overline{K}$	$(6.6 \pm 0.7) \times 10^{-5}$	
Γ_{182}	$\gamma f_0(2100) \to \gamma \pi \pi$	$(4.8 \pm 1.0) \times 10^{-6}$	
Γ_{183}	$\gamma f_0(2200) \to \gamma K \overline{K}$	$(3.2 \pm 1.0) \times 10^{-6}$	
Γ_{184}	$\gamma f_J(2220) \to \gamma \pi \pi$	$< 5.8 \times 10^{-6}$	CL=90%
Γ_{185}	$\gamma f_J(2220) \to \gamma K \overline{K}$	$< 9.5 \times 10^{-6}$	CL=90%

Γ_{186}	$\gamma\eta$		$(9.2 \pm 1.8) \times 10^{-7}$	
Γ_{187}	$\gamma\eta\pi^+\pi^-$		$(8.7 \pm 2.1) \times 10^{-4}$	
Γ_{188}	$\gamma\eta(1405)$			
Γ_{189}	$\gamma\eta(1405) \to \gamma K\overline{K}\pi$		$< 9 \times 10^{-5}$	CL=90%
Γ_{190}	$\gamma\eta(1405) \to \gamma\eta\pi^+\pi^-$		$(3.6 \pm 2.5) \times 10^{-5}$	
Γ_{191}	$\gamma\eta(1405) \to \gamma f_0(980)\pi^0 \to \gamma\pi^+\pi^-\pi^0$		$< 5.0 \times 10^{-7}$	CL=90%
Γ_{192}	$\gamma\eta(1475)$			
Γ_{193}	$\gamma\eta(1475) \to \gamma K\overline{K}\pi$		$< 1.4 \times 10^{-4}$	CL=90%
Γ_{194}	$\gamma\eta(1475) \to \gamma\eta\pi^+\pi^-$		$< 8.8 \times 10^{-5}$	CL=90%
Γ_{195}	$\gamma K^{*0} K^+\pi^- +$ c.c.		$(3.7 \pm 0.9) \times 10^{-4}$	
Γ_{196}	$\gamma K^{*0}\overline{K}^{*0}$		$(2.4 \pm 0.7) \times 10^{-4}$	
Γ_{197}	$\gamma K^0_S K^+\pi^- +$ c.c.		$(2.6 \pm 0.5) \times 10^{-4}$	
Γ_{198}	$\gamma K^+ K^-\pi^+\pi^-$		$(1.9 \pm 0.5) \times 10^{-4}$	
Γ_{199}	$\gamma K^+ K^- 2(\pi^+\pi^-)$		$< 2.2 \times 10^{-4}$	CL=90%
Γ_{200}	$\gamma 2(K^+ K^-)$		$< 4 \times 10^{-5}$	CL=90%
Γ_{201}	$\gamma p\overline{p}$		$(3.9 \pm 0.5) \times 10^{-5}$	S=2.0
Γ_{202}	$\gamma f_2(1950) \to \gamma p\overline{p}$		$(1.20 \pm 0.22) \times 10^{-5}$	
Γ_{203}	$\gamma f_2(2150) \to \gamma p\overline{p}$		$(7.2 \pm 1.8) \times 10^{-6}$	
Γ_{204}	$\gamma X(1835) \to \gamma p\overline{p}$		$(4.6 {}^{+1.8}_{-4.0}) \times 10^{-6}$	
Γ_{205}	$\gamma X \to \gamma p\overline{p}$	[b]	$< 2 \times 10^{-6}$	CL=90%
Γ_{206}	$\gamma p\overline{p}\pi^+\pi^-$		$(2.8 \pm 1.4) \times 10^{-5}$	
Γ_{207}	$\gamma\gamma$		$< 1.5 \times 10^{-4}$	CL=90%
Γ_{208}	$\gamma\gamma J/\psi$		$(3.1 {}^{+1.0}_{-1.2}) \times 10^{-4}$	
Γ_{209}	$e^+ e^- \eta'$		$(1.90 \pm 0.26) \times 10^{-6}$	
Γ_{210}	$e^+ e^- \eta_c(1S)$		$(3.8 \pm 0.4) \times 10^{-5}$	
Γ_{211}	$e^+ e^- \chi_{c0}(1P)$		$(1.06 \pm 0.24) \times 10^{-3}$	
Γ_{212}	$e^+ e^- \chi_{c1}(1P)$		$(8.5 \pm 0.6) \times 10^{-4}$	
Γ_{213}	$e^+ e^- \chi_{c2}(1P)$		$(7.0 \pm 0.8) \times 10^{-4}$	

Weak decays

Γ_{214}	$D^0 e^+ e^- +$ c.c.		$< 1.4 \times 10^{-7}$	CL=90%
Γ_{215}	$\Lambda_c^+ \overline{\Sigma}^- +$ c.c.		$< 1.4 \times 10^{-5}$	CL=90%

Other decays

Γ_{216}	invisible		< 1.6 %	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_{166}	x_{167}	x_{168}
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_{166}	1	0	0	2	1	1	0			
x_{167}	1	0	0	2	1	1	0	0		
x_{168}	1	0	0	3	1	1	0	0	0	
Γ	−81	−4	−1	−38	−34	−16	−7	−1	−1	−1

$\psi(2S)$ PARTIAL WIDTHS

Γ(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 ±0.10 ±0.02	[1] ABLIKIM	15V	BES3	4.0–4.4 $e^+e^- \rightarrow \pi^+\pi^- J/\psi$
2.338±0.037±0.096	ABLIKIM	08B	BES2	$e^+e^- \rightarrow$ hadrons
2.330±0.036±0.110	ABLIKIM	06L	BES2	$e^+e^- \rightarrow$ 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±0.015±0.042	[3] ANASHIN	18	KEDR	e^+e^-
2.282±0.015±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 ± 0.018 ± 0.099 keV from a measurement of [$\Gamma(\psi(2S) \rightarrow e^+ e^-)$] × [B($\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-$)] assuming B($\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-$) = $(34.95 \pm 0.45) \times 10^{-2}$, which we rescale to our best value B($\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-$) = $(34.68 \pm 0.30) \times 10^{-2}$. 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(hadrons) from ANASHIN 12 and assuming lepton universality.

[4] From the sum of $\Gamma_{e^+ e^-} \cdot$B(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 $\Gamma(e^+ e^-)$ = $\Gamma(\mu^+\mu^-)$.

$\Gamma(\gamma\gamma)$ — Γ_{207}

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

$\psi(2S)$ Γ(i)$\Gamma(e^+ e^-)/\Gamma$(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 Γ(i) or the branching ratio Γ(i)/total.

Γ(hadrons) × $\Gamma(e^+ e^-)/\Gamma_{total}$ — $\Gamma_1\Gamma_7/\Gamma$

VALUE (keV)	*DOCUMENT ID*		*TECN*	*COMMENT*
2.233±0.015±0.042	[1] ANASHIN	12	KEDR	$e^+ e^- \rightarrow$ 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.

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

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

$\Gamma(e^+ e^-)$ × $\Gamma(e^+ e^-)/\Gamma_{total}$ — $\Gamma_7\Gamma_7/\Gamma$

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 $\psi(2S)$.

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

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 $\psi(2S)$.

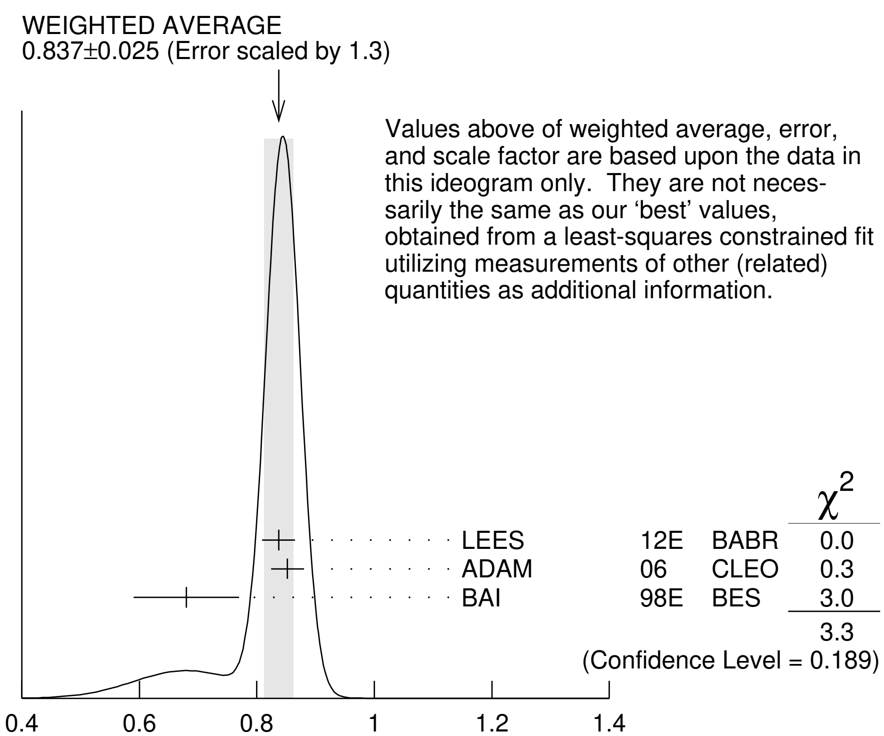
$\Gamma(\tau^+\tau^-) \times \Gamma(e^+e^-)/\Gamma_{total}$ — $\Gamma_9\Gamma_7/\Gamma$

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.

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

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±0.048±0.004	544	[4] AUBERT	05D	BABR	$10.6\ e^+e^- \to \pi^+\pi^-\mu^+\mu^-\gamma$



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

[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 ± 0.033) × 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 ± 2.6) × 10^{-2} and B($J/\psi(1S) \to \ell^+\ell^-$)= 0.1203 ± 0.0038. Recalculated by us using B($J/\psi(1S) \to \ell^+\ell^-$)= 0.1181 ± 0.0020.

[3] AUBERT 07AU reports [$\Gamma(\psi(2S) \to J/\psi(1S)\pi^+\pi^-) \times \Gamma(\psi(2S) \to e^+e^-)/\Gamma_{total}$] × [B($J/\psi(1S) \to \pi^+\pi^-\pi^0$)] = 0.0186 ± 0.0012 ± 0.0011 keV which we divide by our best value B($J/\psi(1S) \to \pi^+\pi^-\pi^0$) = (2.10 ± 0.08) × 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 [$\Gamma(\psi(2S) \to J/\psi(1S)\pi^+\pi^-) \times \Gamma(\psi(2S) \to e^+e^-)/\Gamma_{total}$] × [B($J/\psi(1S) \to \mu^+\mu^-$)] = 0.0450 ± 0.0018 ± 0.0022 keV which we divide by our best value B($J/\psi(1S) \to \mu^+\mu^-$) = (5.961 ± 0.033) × 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.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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 $B(\eta \to 3\pi^0) = 32.57 \times 10^{-2}$.

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

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

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

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 $B(\eta \to 2\gamma) = 39.36 \times 10^{-2}$.

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

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 $B(\eta \to 2\gamma) = 39.36 \times 10^{-2}$.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

[1] LEES 12F reports $[\Gamma(\psi(2S) \rightarrow \phi\pi^+\pi^-) \times \Gamma(\psi(2S) \rightarrow e^+e^-)/\Gamma_{total}] \times [B(\phi(1020) \rightarrow K^+K^-)] = 0.27 \pm 0.09 \pm 0.02$ eV which we divide by our best value $B(\phi(1020) \rightarrow K^+K^-) = (49.1 \pm 0.5) \times 10^{-2}$. 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 $[\Gamma(\psi(2S) \rightarrow \phi\pi^+\pi^-) \times \Gamma(\psi(2S) \rightarrow e^+e^-)/\Gamma_{total}] \times [B(\phi(1020) \rightarrow K^+K^-)] = 0.28 \pm 0.11 \pm 0.02$ eV which we divide by our best value $B(\phi(1020) \rightarrow K^+K^-) = (49.1 \pm 0.5) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

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

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±0.035±0.005	66	[1] LEES	15J	BABR	$e^+e^- \to K^+K^-\gamma$
0.197±0.035±0.005	66	[2] LEES	15J	BABR	$e^+e^- \to K^+K^-\gamma$
0.35 ±0.14 ±0.03	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±0.30±0.06	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±0.42±0.16	85	[1] AUBERT	07AK	BABR	10.6 $e^+e^- \to \pi^+\pi^- K^+K^-\gamma$

[1] Superseded by LEES 12F.

$\Gamma(K^0_S K^0_L \pi^0) \times \Gamma(e^+e^-)/\Gamma_{total}$ — $\Gamma_{64}\Gamma_7/\Gamma$

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

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

VALUE (eV)	EVTS	DOCUMENT ID		TECN	COMMENT
0.60±0.31±0.03	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±1.3±0.3	32	AUBERT	07AU	BABR	10.6 $e^+e^- \to K^+K^-\pi^+\pi^-\pi^0\gamma$

$\Gamma(K^0_S K^0_L \pi^0 \pi^0) \times \Gamma(e^+ e^-)/\Gamma_{total}$ — $\Gamma_{73}\Gamma_7/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID		TECN	COMMENT
2.92±1.27±0.15	14	LEES	17A	BABR	$e^+ e^- \to K^0_S K^0_L \pi^0 \pi^0 \gamma$

$\Gamma(K^0_S K^0_L \eta) \times \Gamma(e^+ e^-)/\Gamma_{total}$ — $\Gamma_{74}\Gamma_7/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID		TECN	COMMENT
3.14±1.08±0.16	16	LEES	17A	BABR	$e^+ e^- \to K^0_S K^0_L \eta \gamma$

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

VALUE (eV)	EVTS	DOCUMENT ID		TECN	COMMENT
3.05±1.80±0.01	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.

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

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

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

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

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

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

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

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

$\Gamma(\text{hadrons})/\Gamma_{\text{total}}$ — 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 $J/\psi(1S)$.

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

$\Gamma(ggg)/\Gamma_{\text{total}}$ — 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 $\Gamma(\gamma gg)/\Gamma_{\text{total}}$ LIBBY 09 measurement.

$\Gamma(\gamma gg)/\Gamma_{\text{total}}$ — 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 $\Gamma(ggg)/\Gamma_{\text{total}}$ LIBBY 09 measurement.

$\Gamma(\gamma gg)/\Gamma(ggg)$ — 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

$\Gamma(\text{light hadrons})/\Gamma_{\text{total}}$ — 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.

$\Gamma(e^+e^-)/\Gamma_{total}$ — 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.

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

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

$\Gamma(\mu^+\mu^-)/\Gamma(e^+e^-)$ — 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^-

$\Gamma(\tau^+\tau^-)/\Gamma_{total}$ — 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 ± 0.0030 to estimate the total number of $\psi(2S)$ events.

DECAYS INTO $J/\psi(1S)$ AND ANYTHING

$\Gamma(J/\psi(1S)\text{anything})/\Gamma_{total}$

$\Gamma_{10}/\Gamma = (\Gamma_{12}+\Gamma_{13}+\Gamma_{14}+0.343\Gamma_{167}+0.190\Gamma_{168})/\Gamma$

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 Γ(ee) and Γ fixed to the PDG 20 values of the cross particle fit which are correlated to "OUR FIT" value for B($\psi(2S) \to J/\psi X$).

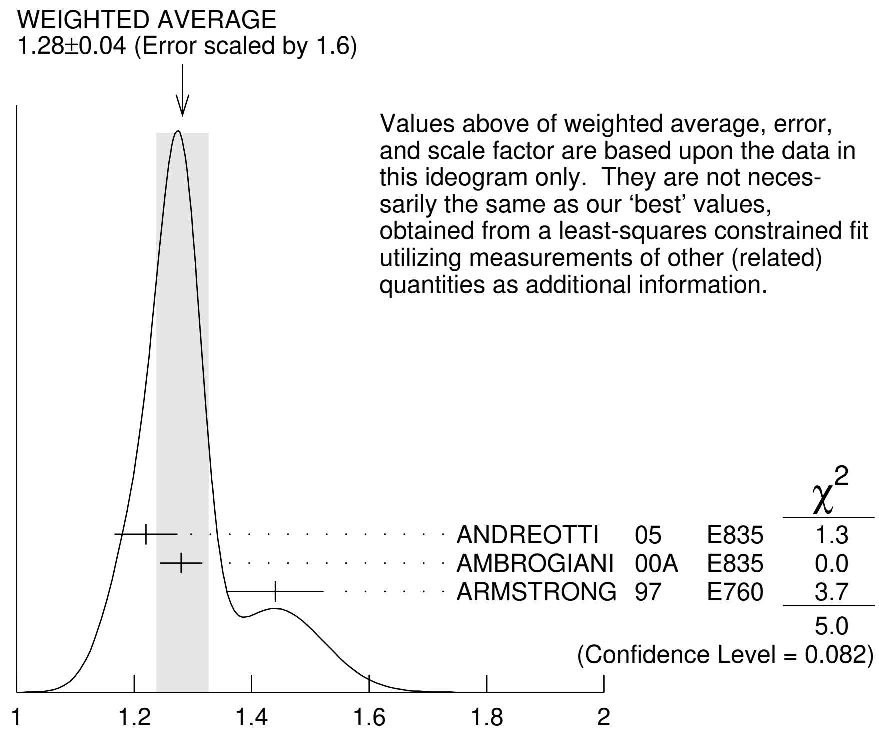
[2] Not independent from other measurements of MENDEZ 08.

$\Gamma(e^+e^-)/\Gamma(J/\psi(1S)\text{anything})$ — 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 $\pm$0.03 $\pm$0.02	[1] AMBROGIANI	00A	E835	$p\overline{p} \to \psi(2S)$
1.44 $\pm$0.08 $\pm$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.



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

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

VALUE	*DOCUMENT ID*		*TECN*	*COMMENT*
0.0130$\pm$0.0010 OUR FIT				
0.014 $\pm$0.003	HILGER	75	SPEC	e^+e^-

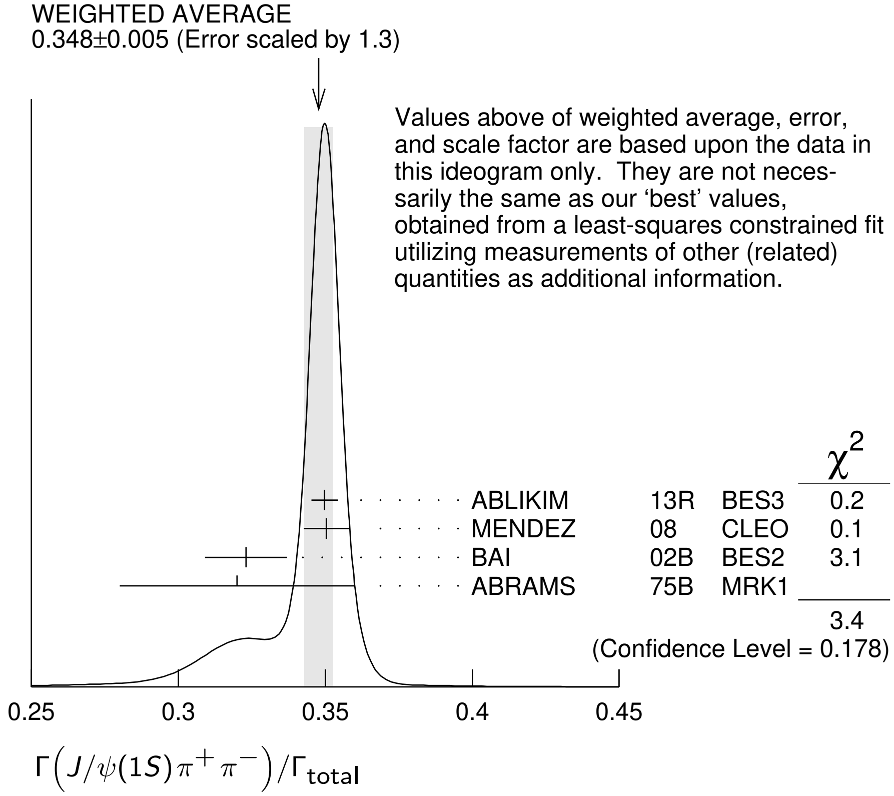
$\Gamma(J/\psi(1S)\text{neutrals})/\Gamma_{\text{total}}$ Γ_{11}/Γ

VALUE	*DOCUMENT ID*
0.2538$\pm$0.0032 OUR FIT	

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

VALUE	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
0.3468$\pm$0.0030 OUR FIT					
0.348 $\pm$0.005 OUR AVERAGE Error includes scale factor of 1.3. See the ideogram below.					
0.3498$\pm$0.0002$\pm$0.0045	20M	ABLIKIM	13R	BES3	$\psi(2S) \to J/\psi\pi^+\pi^-$
0.3504$\pm$0.0007$\pm$0.0077	565k	MENDEZ	08	CLEO	$\psi(2S) \to \ell^+\ell^-\pi^+\pi^-$
0.323 $\pm$0.014		BAI	02B	BES2	e^+e^-
0.32 $\pm$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$\pm$0.0014$\pm$0.0110	60k	[1] ADAM	05A	CLEO	Repl. by MENDEZ 08

[1] Not independent from other values reported by ADAM 05A.



$\Gamma(e^+e^-)/\Gamma(J/\psi(1S)\pi^+\pi^-)$ — 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($J/\psi(1S) \to \mu^+\mu^-$) = $(5.961 \pm 0.033) \times 10^{-2}$.
[2] Using B($J/\psi(1S) \to \mu^+\mu^-$) = $(5.88 \pm 0.10) \times 10^{-2}$.

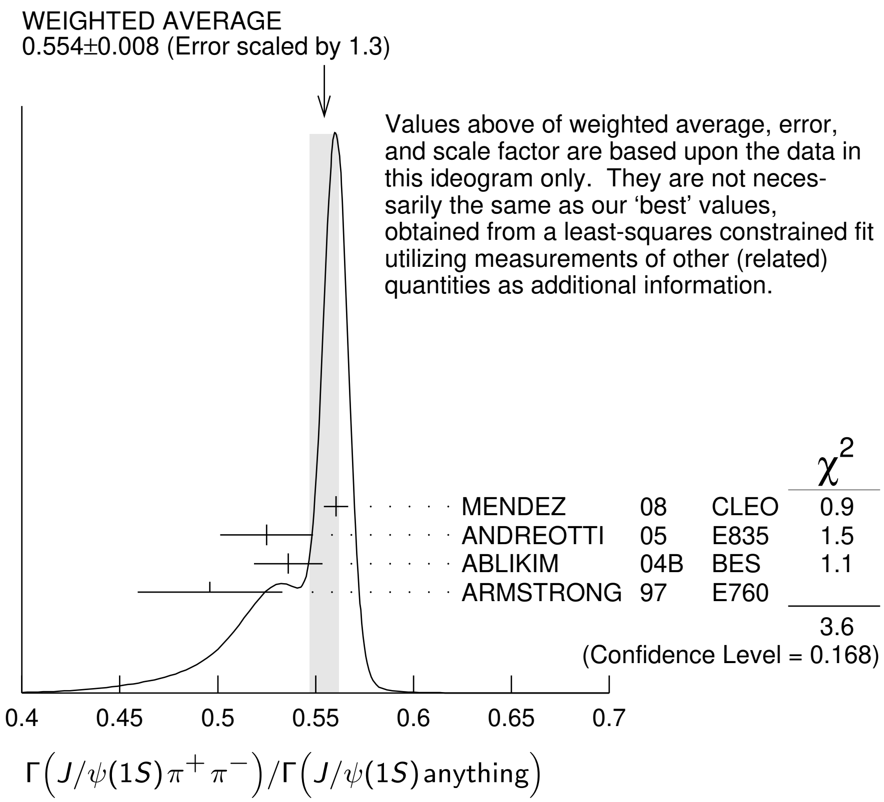
$\Gamma(\tau^+\tau^-)/\Gamma(J/\psi(1S)\pi^+\pi^-)$ — Γ_9/Γ_{12}

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^-

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

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



$\Gamma(J/\psi(1S)\text{neutrals})/\Gamma(J/\psi(1S)\pi^+\pi^-)$
$\Gamma_{11}/\Gamma_{12} = (0.9761\Gamma_{13}+0.719\Gamma_{14}+0.343\Gamma_{167}+0.190\Gamma_{168})/\Gamma_{12}$

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

$\Gamma(J/\psi(1S)\pi^0\pi^0)/\Gamma_{total}$ 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±0.0008±0.0053	61k	[1] MENDEZ	08	CLEO	$\psi(2S) \to \ell^+\ell^- 2\pi^0$
0.1652±0.0014±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.

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.2968±0.0031 OUR FIT					
0.320 ±0.012 OUR AVERAGE					
0.300 ±0.008 ±0.022	1655 ± 44	ANDREOTTI	05	E835	$\psi(2S) \to J/\psi X$
0.328 ±0.013 ±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±0.0012±0.0056	61k	MENDEZ	08	CLEO	$\psi(2S) \to \ell^+\ell^- 2\pi^0$
0.2776±0.0025±0.0043	13.4k	ADAM	05A	CLEO	Repl. by MENDEZ 08

$\Gamma(J/\psi(1S)\pi^0\pi^0)/\Gamma(J/\psi(1S)\pi^+\pi^-)$ 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±0.0022±0.0102	61k	MENDEZ	08	CLEO	$\psi(2S) \to \ell^+\ell^- 2\pi^0$
0.570 ±0.009 ±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±0.0047±0.0086	73k	[2,3] ADAM	05A	CLEO	Repl. by MENDEZ 08
0.571 ±0.018 ±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^-

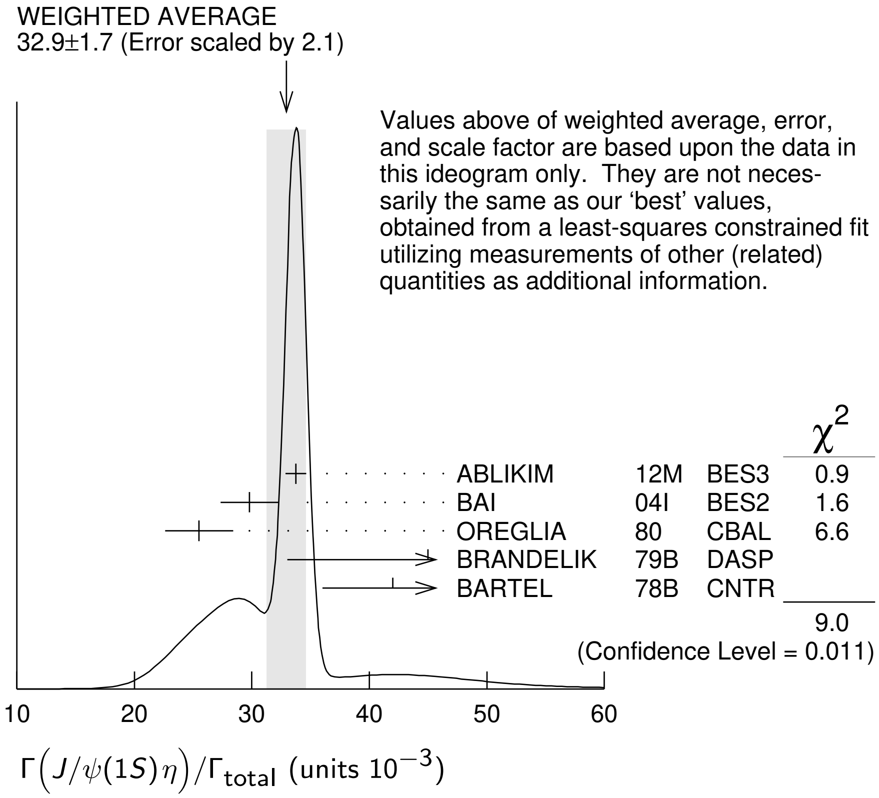
[1] From a fit to the J/ψ recoil mass spectra.
[2] Not independent from other values reported by ADAM 05A.
[3] Using 13,217 $J/\psi\pi^0\pi^0$ and 60,010 $J/\psi\pi^+\pi^-$ events.
[4] Not independent from other values reported by ANDREOTTI 05.
[5] Ignoring the $J/\psi(1S)\eta$ and $J/\psi(1S)\gamma\gamma$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

$\Gamma(J/\psi(1S)\eta)/\Gamma_{total}$ 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± 0.17±0.86	68.2k	ABLIKIM	12M	BES3	$e^+e^- \to \ell^+\ell^- 2\gamma$
29.8 ± 0.9 ±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 ± 0.4 ±0.9	18.4k	[3] MENDEZ	08	CLEO	$\psi(2S) \to \ell^+\ell^-\eta$
32.5 ± 0.6 ±1.1	2.8k	[4] ADAM	05A	CLEO	Repl. by MENDEZ 08
43 ± 8	44	TANENBAUM	76	MRK1	e^+e^-

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

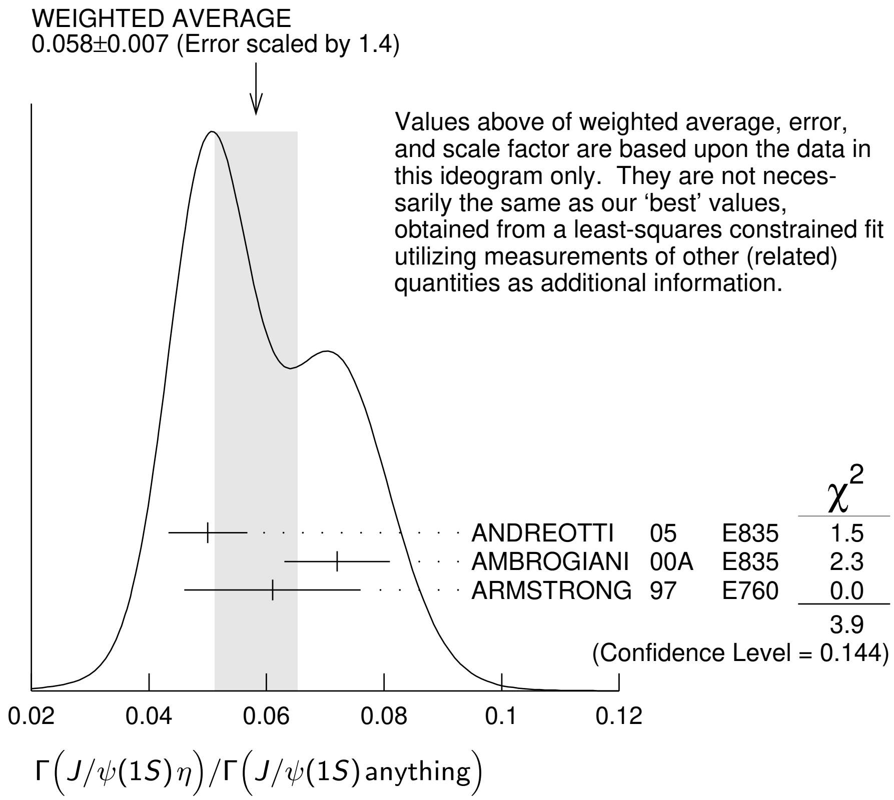
[2] Recalculated by us using B($J/\psi(1S) \to \mu^+\mu^-$) = 0.0588 ± 0.0010.
[3] Not independent from other measurements of MENDEZ 08.
[4] Not independent from other values reported by ADAM 05A.



$\Gamma(J/\psi(1S)\eta)/\Gamma(J/\psi(1S)\text{anything})$ — 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

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



$\Gamma(J/\psi(1S)\eta)/\Gamma(J/\psi(1S)\pi^+\pi^-)$ — 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(ψ(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 ± 0.0020.

$\Gamma(J/\psi(1S)\pi^0)/\Gamma(J/\psi(1S)\text{anything})$ $\Gamma_{15}/\Gamma_{10} = \Gamma_{15}/(\Gamma_{12}+\Gamma_{13}+\Gamma_{14}+0.343\Gamma_{167}+0.190\Gamma_{168})$

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.213±0.012±0.003	527	[1] MENDEZ	08	CLEO	$e^+e^- \to J/\psi\gamma\gamma$
0.22 ±0.02 ±0.01		[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.

$\Gamma(J/\psi(1S)\pi^0)/\Gamma(J/\psi(1S)\pi^+\pi^-)$ 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±0.022±0.005	527	[1] MENDEZ	08	CLEO	$e^+e^- \to J/\psi\gamma\gamma$
0.39 ±0.04 ±0.01		[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

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

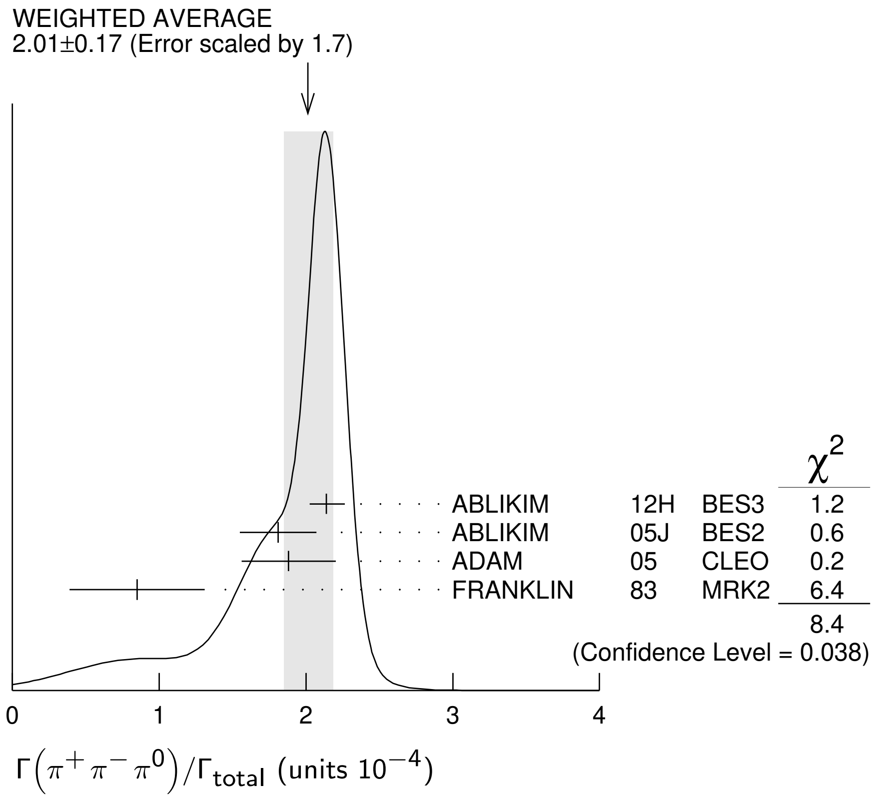
VALUE (units 10^{-5})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
0.78±0.26 OUR AVERAGE						
0.76±0.25±0.06		30	[1] METREVELI	12		$\psi(2S) \to \pi^+\pi^-$
8 ±5			BRANDELIK	79C	DASP	e^+e^-
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<2.1	90		DOBBS	06A	CLEO	$e^+e^- \to \psi(2S)$
<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.

$\Gamma(\pi^+\pi^-\pi^0)/\Gamma_{total}$ 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±0.18±0.19	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 $\psi(2S) \to \pi^+\pi^-\pi^0$.



$\Gamma\big(\rho(770)\pi \to \pi^+\pi^-\pi^0\big)/\Gamma_{total}$ 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±0.07±0.11			[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 $\rho^0\pi^0$.

$\Gamma\big(\rho(2150)\pi \to \pi^+\pi^-\pi^0\big)/\Gamma_{total}$ 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 $\psi(2S) \to \pi^+\pi^-\pi^0$.

$\Gamma\big(2(\pi^+\pi^-)\big)/\Gamma_{total}$ 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±0.2±0.2	308	BRIERE	05	CLEO	$e^+e^- \to \psi(2S) \to 2(\pi^+\pi^-)$
4.5±1.0		TANENBAUM	78	MRK1	e^+e^-

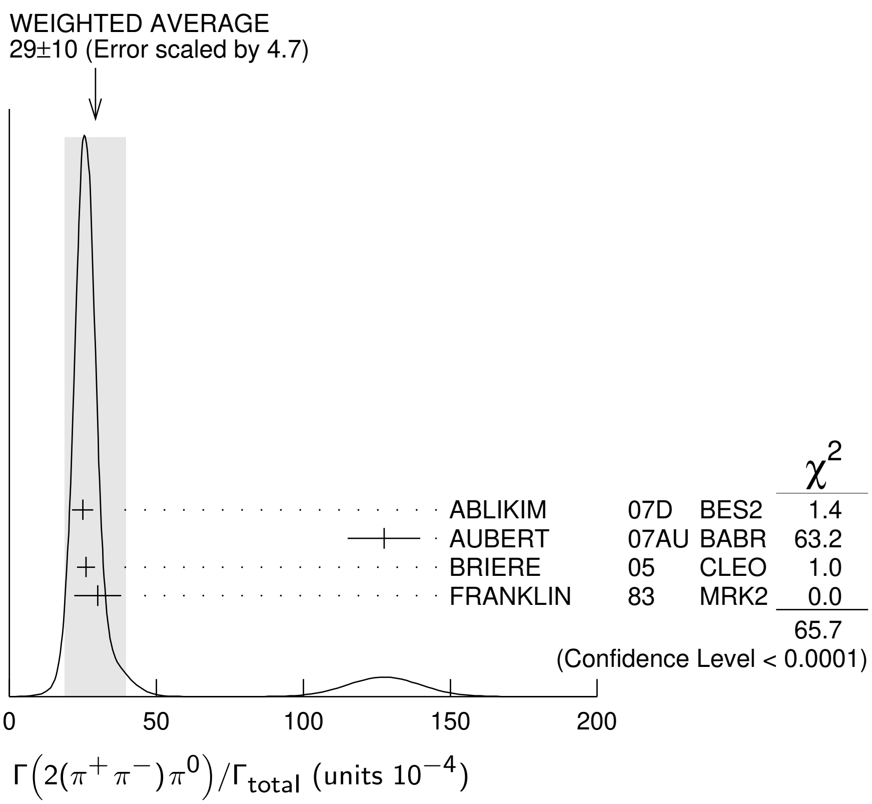
$\Gamma(\rho^0\pi^+\pi^-)/\Gamma_{total}$ Γ_{21}/Γ

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^-

[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^-

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

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

[1] Assuming entirely strong decay.

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

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

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

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

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

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
9.5±0.7±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±0.8±1.4	201.7	[2] BRIERE	05	CLEO	$e^+e^- \to \psi(2S) \to \eta 3\pi(\eta \to \gamma\gamma)$
8.1±1.4±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.

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

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
2.2 ±0.6 OUR AVERAGE Error includes scale factor of 1.1.					
$3.0\ ^{+1.1}_{-0.9}\ \pm0.2$	18	ADAM	05	CLEO	$e^+e^- \to \psi(2S)$
$1.78^{+0.67}_{-0.62}\pm0.17$	13	ABLIKIM	04L	BES	$e^+e^- \to \psi(2S)$

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

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

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

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
$\mathbf{1.87\ ^{+1.64}_{-1.11}\ \pm0.33}$	2	ABLIKIM	04L	BES	$e^+e^- \to \psi(2S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1.02 ±0.11 ±0.24	143	[1] ABLIKIM	17AK	BES3	$e^+e^- \to \psi(2S)$

0.569±0.128±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 $\psi(2S) \to \pi^+\pi^-\eta'$.

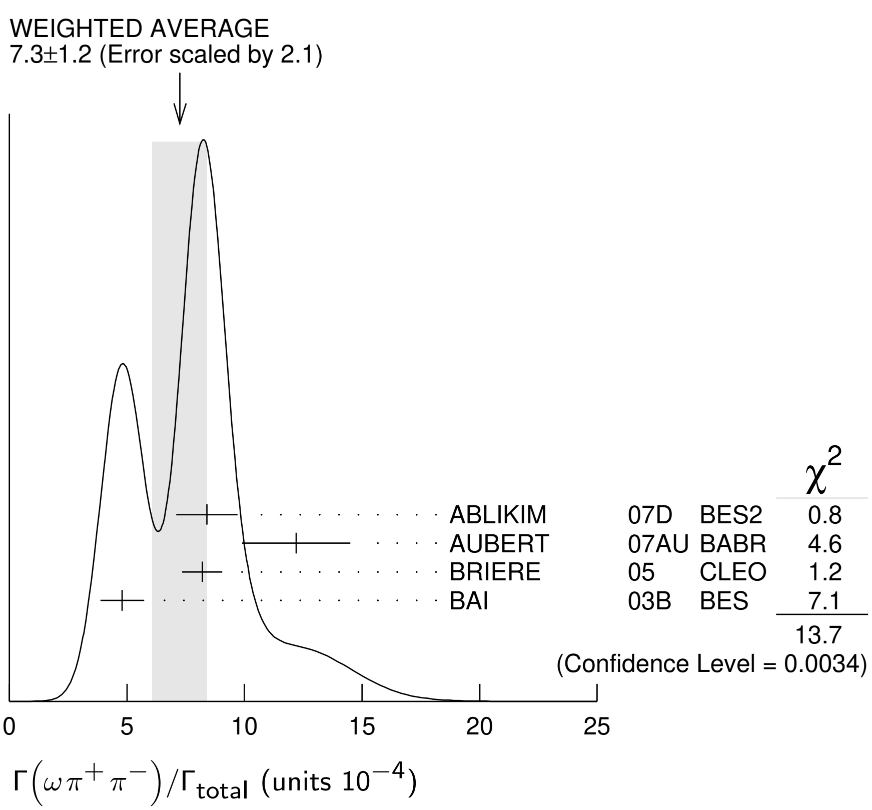
$\Gamma(\omega\pi^0)/\Gamma_{total}$ Γ_{40}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
2.1 ±0.6 OUR AVERAGE					
$2.5\ ^{+1.2}_{-1.0}\ \pm0.2$	14	ADAM	05	CLEO	$e^+e^- \to \psi(2S)$
$1.87^{+0.68}_{-0.62}\pm0.28$	14	ABLIKIM	04L	BES	$e^+e^- \to \psi(2S)$

$\Gamma(\omega\pi^+\pi^-)/\Gamma_{total}$ 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±0.5±1.2	386	ABLIKIM	07D	BES2	$e^+e^- \to \psi(2S)$
12.2±2.2±0.7	37	[1] AUBERT	07AU	BABR	10.6 $e^+e^- \to \omega\pi^+\pi^-\gamma$
8.2±0.5±0.7	391	BRIERE	05	CLEO	$e^+e^- \to \psi(2S) \to 2(\pi^+\pi^-)\pi^0$
4.8±0.6±0.7	100 ± 22	[2] BAI	03B	BES	$\psi(2S) \to 2(\pi^+\pi^-)\pi^0$

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



$\Gamma(b_1^{\pm}\pi^{\mp})/\Gamma_{total}$ — 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	$e^+e^- \to \psi(2S)$
$4.18^{+0.43}_{-0.42}\pm0.92$	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 ± 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 ± 0.016.

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

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
$\mathbf{2.35^{+0.47}_{-0.42}\pm0.40}$	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
$\mathbf{3.2^{+2.4}_{-2.0}\pm0.7}$	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	$e^+e^- \to \psi(2S)$

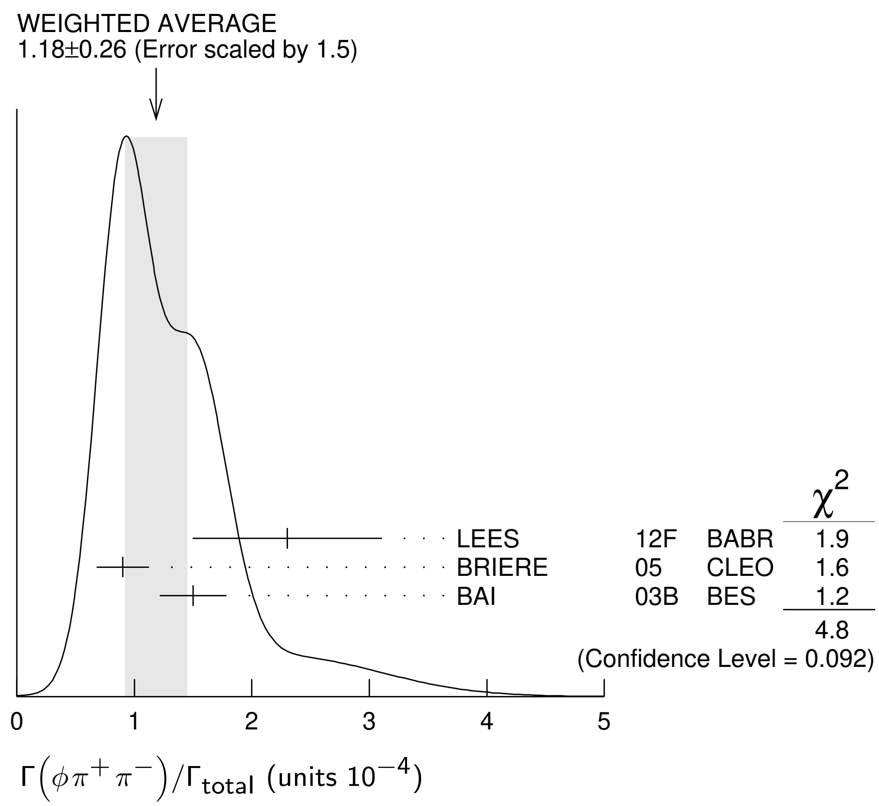
$\Gamma(\phi\pi^+\pi^-)/\Gamma_{total}$ Γ_{51}/Γ

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 $e^+e^- \to \pi^+\pi^- K^+K^-\gamma$
0.9 ±0.2 ±0.1	47.6	BRIERE	05	CLEO	$e^+e^- \to \psi(2S) \to K^+K^-\pi^+\pi^-$
1.5 ±0.2 ±0.2	51.5±8.3	[1] BAI	03B	BES	$\psi(2S) \to K^+K^-\pi^+\pi^-$
• • • 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 $e^+e^- \to \pi^+\pi^- K^+K^-\gamma$

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

[2] Superseded by LEES 12F. AUBERT 07AK reports $[\Gamma(\psi(2S) \to \phi\pi^+\pi^-)/\Gamma_{total}] \times [\Gamma(\psi(2S) \to e^+e^-)] = (0.57 \pm 0.22 \pm 0.04) \times 10^{-3}$ 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 ± 0.6)%.



$\Gamma(\phi f_0(980) \to \pi^+\pi^-)/\Gamma_{total}$ 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 $e^+e^- \to \pi^+\pi^- K^+K^-\gamma$
0.6 ±0.2 ±0.1	18.4±6.4	[1] BAI	03B	BES	$\psi(2S) \to K^+K^-\pi^+\pi^-$

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

1.46±0.71±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 ± 0.016.

[2] Superseded by LEES 12F. AUBERT 07AK reports [$\Gamma(\psi(2S) \to \phi f_0(980) \to \pi^+\pi^-)/\Gamma_{total}$] × [$\Gamma(\psi(2S) \to e^+e^-)$] = $(0.34 \pm 0.16 \pm 0.04) \times 10^{-3}$ keV which we divide by our best value $\Gamma(\psi(2S) \to e^+e^-)$ = 2.33 ± 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 ± 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±0.23±0.23	0.2k	ABLIKIM	12L	BES3	$e^+e^- \to \psi(2S)$
2.0 $^{+1.5}_{-1.1}$ ±0.4	6	ADAM	05	CLEO	$e^+e^- \to \psi(2S)$
3.3 ±1.1 ±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 × 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±0.16±0.12	201	ABLIKIM	19BA	BES3	$e^+e^- \to \psi(2S)$
3.1 ±1.4 ±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 [$\Gamma(\psi(2S) \to \phi f_1(1285))/\Gamma_{total}$] × [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	$e^+e^- \to 2(K^+K^-)$

$\Gamma(K^+ K^-)/\Gamma_{total}$ 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.

$\Gamma(K^+ K^- \pi^+)/\Gamma_{total}$ 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.

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

$\Gamma(K^0_S K^0_S)/\Gamma_{total}$ 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 ± 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	$\psi(2S) \to K^+K^-\pi^+\pi^-\pi^0$

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

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

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

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

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

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

$\Gamma(K^*(892)^0 K^-\rho^+ + \text{c.c.})/\Gamma_{total}$ — 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	$e^+ e^- \rightarrow \psi(2S) \rightarrow K^+ K^- \pi^+ \pi^-$

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

VALUE (units 10^{-4})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
1.86±0.32±0.43		93 ± 16	BAI	04C		$\psi(2S) \rightarrow K^+ K^- \pi^+ \pi^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<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 $e^+ e^- \rightarrow K^+ K^- \pi^+ \pi^- \eta\gamma$

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

$\Gamma(K^+ K^*(892)^- + c.c.)/\Gamma_{total}$ — 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	$e^+ e^- \rightarrow \psi(2S)$
$2.9\ ^{+1.3}_{-1.7} \pm 0.4$		9.6 ± 4.2	ABLIKIM	05I	BES2	$e^+ e^- \rightarrow \psi(2S)$
$1.3\ ^{+1.0}_{-0.7} \pm 0.3$		7	ADAM	05	CLEO	$e^+ e^- \rightarrow \psi(2S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<5.4	90		FRANKLIN	83	MRK2	$e^+ e^- \rightarrow$ 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 $e^+ e^- \rightarrow 2(K^+ K^-)\gamma$
0.6 ±0.1 ±0.1	59.2	BRIERE	05	CLEO	$e^+ e^- \rightarrow \psi(2S) \rightarrow 2(K^+ K^-)$

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

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

$\Gamma(K^+ K^- \phi)/\Gamma_{total}$ — 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
$7.12\pm0.62^{+1.13}_{-0.61}$	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					
$13.3^{+2.4}_{-2.8}\pm1.7$	65.6 ± 9.0	ABLIKIM	05I	BES2	$e^+ e^- \to \psi(2S)$
$9.2^{+2.7}_{-2.2}\pm0.9$	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±0.04±0.11	2.8k	ABLIKIM	14G	BES3	$\psi(2S) \to K^+ K^- \pi^+ \pi^- \pi^0$
2.38±0.37±0.29	78	ABLIKIM	06G	BES2	$\psi(2S) \to K^+ K^- \pi^+ \pi^- \pi^0$
1.9 ±0.3 ±0.3	76.8	BRIERE	05	CLEO	$e^+ e^- \to \psi(2S) \to K^+ K^- \pi^+ \pi^- \pi^0$
1.5 ±0.3 ±0.2	23	[1] BAI	03B	BES	$\psi(2S) \to K^+ K^- \pi^+ \pi^- \pi^0$

[1] Normalized to B($\psi(2S) \to J/\psi \pi^+ \pi^-$) = 0.305 ± 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±2.9±2.2	396	ABLIKIM	13M	BES3	$\psi(2S) \to \omega K^0_S K^- \pi^+$
22.6±3.0±2.4	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±1.50±0.78	128	ABLIKIM	13M	BES3	$\psi(2S) \to \omega K^0_S K^- \pi^+$
5.86±1.61±0.83	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.

$\Gamma(\omega X(1440) \to \omega K^+ K^- \pi^0)/\Gamma_{total}$ — 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.

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

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

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

$\Gamma(\omega f_1(1285) \to \omega K^+ K^- \pi^0)/\Gamma_{total}$ — 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.

$\Gamma(p\overline{p})/\Gamma_{total}$ — 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.

$\Gamma(p\overline{p})/\Gamma(J/\psi(1S)\pi^+\pi^-)$ — 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	$e^+ e^- \to \psi(2S) \to p\overline{p}$

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

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

$\Gamma(p\overline{p}\pi^0)/\Gamma_{total}$ — 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)%.

$\Gamma\big(N(940)\overline{p}+\text{c.c.}\rightarrow p\overline{p}\pi^0\big)/\Gamma_{\text{total}}$ 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	$\psi(2S)\rightarrow p\overline{p}\pi^0$

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

$\Gamma\big(N(1440)\overline{p}+\text{c.c.}\rightarrow p\overline{p}\pi^0\big)/\Gamma_{\text{total}}$ 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	$\psi(2S)\rightarrow p\overline{p}\pi^0$
$8.1\pm0.7\pm0.3$	474	[2] ALEXANDER	10	CLEO	$\psi(2S)\rightarrow \pi^0 p\overline{p}$

[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.

$\Gamma\big(N(1520)\overline{p}+\text{c.c.}\rightarrow p\overline{p}\pi^0\big)/\Gamma_{\text{total}}$ 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	$\psi(2S)\rightarrow p\overline{p}\pi^0$

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

$\Gamma\big(N(1535)\overline{p}+\text{c.c.}\rightarrow p\overline{p}\pi^0\big)/\Gamma_{\text{total}}$ 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	$\psi(2S)\rightarrow p\overline{p}\pi^0$

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

$\Gamma\big(N(1650)\overline{p}+\text{c.c.}\rightarrow p\overline{p}\pi^0\big)/\Gamma_{\text{total}}$ 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	$\psi(2S)\rightarrow p\overline{p}\pi^0$

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

$\Gamma\big(N(1720)\overline{p}+\text{c.c.}\rightarrow p\overline{p}\pi^0\big)/\Gamma_{\text{total}}$ 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	$\psi(2S)\rightarrow p\overline{p}\pi^0$

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

$\Gamma\big(N(2300)\overline{p}+\text{c.c.}\rightarrow p\overline{p}\pi^0\big)/\Gamma_{\text{total}}$ 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	$\psi(2S)\rightarrow p\overline{p}\pi^0$

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

$\Gamma\big(N(2570)\overline{p}+ \text{c.c.} \to p\overline{p}\pi^0\big)/\Gamma_{\text{total}}$ — Γ_{111}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
$2.13\pm0.08^{+0.40}_{-0.30}$	0.8k	[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.

$\Gamma\big(p\overline{p}\pi^+\pi^-\big)/\Gamma_{\text{total}}$ — Γ_{112}/Γ

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	$e^+e^- \to \psi(2S) \to p\overline{p}\pi^+\pi^-$
$8\ \pm2$		[1] TANENBAUM	78	MRK1	e^+e^-

[1] Assuming entirely strong decay.

$\Gamma\big(p\overline{p}K^+K^-\big)/\Gamma_{\text{total}}$ — Γ_{113}/Γ

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

$\Gamma\big(p\overline{p}\eta\big)/\Gamma_{\text{total}}$ — Γ_{114}/Γ

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	$\psi(2S) \to \eta p\overline{p}$
$5.6\pm0.6\pm0.3$	154	[1] ALEXANDER	10	CLEO	$\psi(2S) \to \eta p\overline{p}$
$5.8\pm1.1\pm0.7$	44.8 ± 8.5	[2] ABLIKIM	05E	BES2	$e^+e^- \to \psi(2S) \to p\overline{p}\gamma\gamma$
$8\ \pm3\ \pm3$	9.8	BRIERE	05	CLEO	$e^+e^- \to \psi(2S) \to p\overline{p}\pi^+\pi^-\pi^0$

[1] With $N(1535)$ decaying to $p\eta$.
[2] Computed using $B(\eta \to \gamma\gamma) = (39.43 \pm 0.26)\%$.

$\Gamma\big(N(1535)\overline{p}+ \text{c.c.} \to p\overline{p}\eta\big)/\Gamma_{\text{total}}$ — Γ_{115}/Γ

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

[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.

$\Gamma\big(p\overline{p}\pi^+\pi^-\pi^0\big)/\Gamma_{\text{total}}$ — Γ_{116}/Γ

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

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

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

$\Gamma(p\overline{p}\omega)/\Gamma_{total}$ 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.

$\Gamma(p\overline{p}\eta')/\Gamma_{total}$ 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.

$\Gamma(p\overline{p}\phi)/\Gamma_{total}$ 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.

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

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

$\Gamma(p\overline{n}\pi^-$ or c.c.$)/\Gamma_{total}$ 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	$e^+e^- \to \overline{p}\pi^+X$

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

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

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

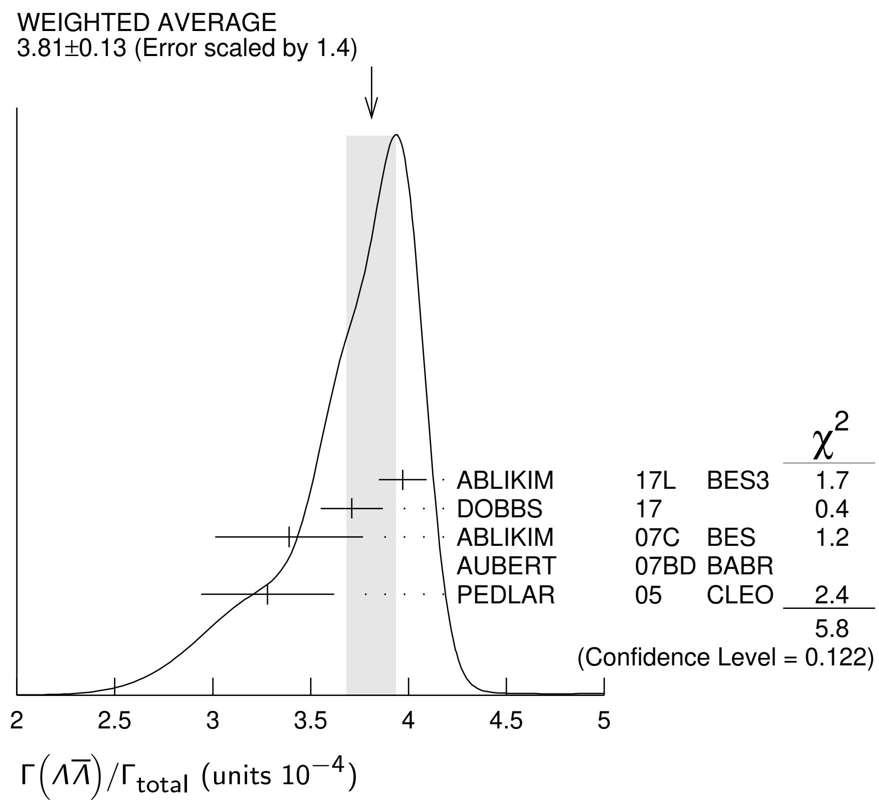
VALUE (units 10^{-4})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
3.81±0.13 OUR AVERAGE			Error includes scale factor of 1.4. See the ideogram below.			
3.97±0.02±0.12		31k	ABLIKIM	17L	BES3	$e^+e^- \rightarrow \Lambda\overline{\Lambda}$
3.71±0.05±0.15		6.5k	[1] DOBBS	17		$e^+e^- \rightarrow \Lambda\overline{\Lambda}$
3.39±0.20±0.32		337	ABLIKIM	07C	BES	$e^+e^- \rightarrow \psi(2S) \rightarrow$ hadrons
6.4 ±1.8 ±0.1			[2] AUBERT	07BD	BABR	10.6 $e^+e^- \rightarrow \Lambda\overline{\Lambda}\gamma$
3.28±0.23±0.25		208	PEDLAR	05	CLEO	$e^+e^- \rightarrow \psi(2S) \rightarrow$ hadrons
• • • We do not use the following data for averages, fits, limits, etc. • • •						
3.75±0.09±0.23		1.9k	[1,3] DOBBS	14		$e^+e^- \rightarrow \Lambda\overline{\Lambda}$
1.81±0.20±0.27		80	[4] BAI	01	BES	$e^+e^- \rightarrow \psi(2S) \rightarrow$ hadrons
< 4	90		FELDMAN	77	MRK1	$e^+e^- \rightarrow \psi(2S) \rightarrow$ hadrons

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

[2] AUBERT 07BD reports $[\Gamma(\psi(2S) \rightarrow \Lambda\overline{\Lambda})/\Gamma_{total}] \times [\Gamma(\psi(2S) \rightarrow e^+e^-)] = (15 \pm 4 \pm 1) \times 10^{-4}$ keV which we divide by our best value $\Gamma(\psi(2S) \rightarrow e^+e^-) = 2.33 \pm 0.04$ 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 $B(\psi(2S) \rightarrow J/\psi\pi^+\pi^-) = 0.310 \pm 0.028$.



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

VALUE (units 10^{-6})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
1.42±0.39±0.59		23	[1] ABLIKIM	22AP	BES3	$\psi(2S) \rightarrow p\overline{p}\pi^+\pi^-\gamma\gamma$

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

< 2.9	90	[2] ABLIKIM	13F	BES3	$\psi(2S) \to p\overline{p}\pi^+\pi^-\gamma\gamma$
<120	90	[3] ABLIKIM	07H	BES2	$e^+e^- \to \psi(2S)$

[1] With a significance of 3.7 σ. The corresponding 90% CL upper limit is 2.47×10^{-6}.
[2] Using B($\Lambda \to \pi^- p$) = 63.9% and B($\pi^0 \to \gamma\gamma$) = 98.8%.
[3] Using B($\Lambda \to \pi^- p$) = 63.9% and B($\eta \to \gamma\gamma$) = 39.4%.

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

VALUE (units 10^{-5})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
2.43±0.32 OUR AVERAGE						
2.34±0.18±0.52		218	ABLIKIM	22AP	BES3	$\psi(2S) \to p\overline{p}\pi^+\pi^-\gamma\gamma$
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%.

$\Gamma(\Lambda(1670)\overline{\Lambda} \to \Lambda\overline{\Lambda}\eta)/\Gamma_{total}$ — Γ_{127}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
1.29±0.31±0.62	116	[1] ABLIKIM	22AP	BES3	$\psi(2S) \to p\overline{p}\pi^+\pi^-\gamma\gamma$

[1] From a partial wave analysis of the $\Lambda\eta$ system.

$\Gamma(\Lambda\overline{\Lambda}\omega(782))/\Gamma_{total}$ — Γ_{128}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
3.30±0.34±0.29	207	[1] ABLIKIM	22AZ	BES3	$e^+e^- \to \psi(2S)$

[1] Using B($\Lambda \to \pi^- p$) = 0.639 and B($\omega \to \pi^+\pi^-\pi^0$) = 0.893.

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

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

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

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

$\Gamma(\Lambda\overline{p}K^*(892)^+ + c.c.)/\Gamma_{total}$ — Γ_{131}/Γ

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

$\Gamma(\Lambda\overline{p}K^+\pi^+\pi^-)/\Gamma_{total}$ — Γ_{132}/Γ

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

$\Gamma(\overline{\Lambda} n K^0_S + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{133}/Γ

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

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

$\Gamma(\Delta^{++}\overline{\Delta}^{--})/\Gamma_{\text{total}}$ Γ_{134}/Γ

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

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

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

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

$\Gamma(\Lambda\overline{\Sigma}^-\pi^+ + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{136}/Γ

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

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

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

$\Gamma(\Lambda\overline{\Sigma}^0)/\Gamma_{\text{total}}$ Γ_{138}/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	$e^+ e^- \rightarrow \psi(2S) \rightarrow$ hadrons

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

$\Gamma(\Sigma^0\overline{p}K^+ + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{139}/Γ

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

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

$\Gamma(\Sigma^+\overline{\Sigma}^-)/\Gamma_{\text{total}}$ Γ_{140}/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	$\psi(2S) \rightarrow p\pi^0\overline{p}\pi^0$
2.31±0.06±0.10	1.9k	[1] DOBBS	17		$e^+ e^- \rightarrow \psi(2S) \rightarrow$ hadrons
2.57±0.44±0.68	35	PEDLAR	05	CLEO	$e^+ e^- \rightarrow \psi(2S) \rightarrow$ hadrons
• • • We do not use the following data for averages, fits, limits, etc. • • •					
2.51±0.15±0.16	281	[1,2] DOBBS	14		$e^+ e^- \rightarrow \psi(2S) \rightarrow$ hadrons

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

$\Gamma(\Sigma^0\overline{\Sigma}^0)/\Gamma_{total}$ — Γ_{141}/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.

$\Gamma(\Sigma^-\overline{\Sigma}^+)/\Gamma_{total}$ — Γ_{142}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
2.82±0.04±0.08	6.6k	ABLIKIM	22AV	BES3	$\psi(2S) \to n\pi^-\overline{n}\pi^+$

$\Gamma(\Sigma^+\overline{\Sigma}^-\eta)/\Gamma_{total}$ — Γ_{143}/Γ

VALUE (units 10^{-6})	EVTS	DOCUMENT ID		TECN	COMMENT
9.59±2.37±0.61	21	ABLIKIM	22AY	BES3	$\psi(2S) \to \Sigma^+\overline{\Sigma}^-\eta$

$\Gamma(\Sigma(1385)^+\overline{\Sigma}(1385)^-)/\Gamma_{total}$ — Γ_{144}/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.

$\Gamma(\Sigma(1385)^-\overline{\Sigma}(1385)^+)/\Gamma_{total}$ — Γ_{145}/Γ

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

$\Gamma(\Sigma(1385)^0\overline{\Sigma}(1385)^0)/\Gamma_{total}$ — Γ_{146}/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

$\Gamma(\Xi^-\overline{\Xi}^+)/\Gamma_{total}$ — Γ_{147}/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. • • •

$2.66\pm0.12\pm0.20$	548	[1,2] DOBBS	14		$e^+e^- \rightarrow \psi(2S) \rightarrow$ hadrons
$0.94\pm0.27\pm0.15$	12	[3] BAI	01	BES	$e^+e^- \rightarrow \psi(2S) \rightarrow$ hadrons
<2	90	FELDMAN	77	MRK1	$e^+e^- \rightarrow \psi(2S) \rightarrow$ hadrons

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

$\Gamma(\Xi^0\overline{\Xi}^0)/\Gamma_{total}$ Γ_{148}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
2.3 ±0.4 OUR AVERAGE	Error includes scale factor of 4.2.				
$2.73\pm0.03\pm0.13$	11k	ABLIKIM	17E	BES3	$e^+e^- \rightarrow \psi(2S) \rightarrow$ hadrons
$1.97\pm0.06\pm0.11$	1.2k	[1] DOBBS	17		$e^+e^- \rightarrow \psi(2S) \rightarrow$ hadrons
$2.75\pm0.64\pm0.61$	19	PEDLAR	05	CLEO	$e^+e^- \rightarrow \psi(2S) \rightarrow$ hadrons
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$2.02\pm0.19\pm0.15$	112	[1,2] DOBBS	14		$e^+e^- \rightarrow \psi(2S) \rightarrow$ hadrons

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

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

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

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

$\Gamma(\Lambda\overline{\Xi}^+K^- + c.c.)/\Gamma_{total}$ Γ_{150}/Γ

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

$\Gamma(\Xi(1530)^-\overline{\Xi}(1530)^+)/\Gamma_{total}$ Γ_{151}/Γ

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

$\Gamma(\Xi(1530)^-\overline{\Xi}^+)/\Gamma_{total}$ Γ_{152}/Γ

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

$\Gamma(\Xi(1530)^0\overline{\Xi}^0)/\Gamma_{total}$ Γ_{153}/Γ

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

$\Gamma(\Xi(1690)^- \overline{\Xi}^+ \to K^- \Lambda \overline{\Xi}^+ + \text{c.c.})/\Gamma_{\text{total}}$ — Γ_{154}/Γ

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

$\Gamma(\Xi(1820)^- \overline{\Xi}^+ \to K^- \Lambda \overline{\Xi}^+ + \text{c.c.})/\Gamma_{\text{total}}$ — Γ_{155}/Γ

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

$\Gamma(\Sigma^0 \overline{\Xi}^+ K^- + \text{c.c.})/\Gamma_{\text{total}}$ — Γ_{156}/Γ

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

$\Gamma(\Omega^- \overline{\Omega}^+)/\Gamma_{\text{total}}$ — Γ_{157}/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.

$\Gamma(\eta_c \pi^+ \pi^- \pi^0)/\Gamma_{\text{total}}$ — Γ_{158}/Γ

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

$\Gamma(h_c(1P)\pi^0)/\Gamma_{\text{total}}$ — Γ_{159}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
7.4 ±0.5 OUR AVERAGE					
7.32±0.34±0.41	46k	ABLIKIM	22AQ	BES3	$\psi(2S) \to \pi^0$ hadrons
9.0 ±1.5 ±1.3	3k	[1] GE	11	CLEO	$\psi(2S) \to \pi^0$ anything
• • • We do not use the following data for averages, fits, limits, etc. • • •					
8.4 ±1.3 ±1.0	11k	[2] ABLIKIM	10B	BES3	$\psi(2S) \to \pi^0 h_c$
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.

[2] Superseded by ABLIKIM 22AQ

$\Gamma(\Lambda_c^+ \overline{p} e^+ e^- + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{160}/Γ

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

$\Gamma(\Theta(1540)\overline{\Theta}(1540) \to K_S^0 p K^- \overline{n} + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{161}/Γ

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

$\Gamma(\Theta(1540) K^- \overline{n} \to K_S^0 p K^- \overline{n})/\Gamma_{\text{total}}$ Γ_{162}/Γ

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

$\Gamma(\Theta(1540) K_S^0 \overline{p} \to K_S^0 \overline{p} K^+ n)/\Gamma_{\text{total}}$ Γ_{163}/Γ

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

$\Gamma(\overline{\Theta}(1540) K^+ n \to K_S^0 \overline{p} K^+ n)/\Gamma_{\text{total}}$ Γ_{164}/Γ

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

$\Gamma(\overline{\Theta}(1540) K_S^0 p \to K_S^0 p K^- \overline{n})/\Gamma_{\text{total}}$ Γ_{165}/Γ

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

RADIATIVE DECAYS

$\Gamma(\gamma \chi_{c0}(1P))/\Gamma_{\text{total}}$ Γ_{166}/Γ

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
9.79 ±0.20 OUR FIT					
9.33 ±0.26 OUR AVERAGE					
9.389±0.014±0.332	4.7M	ABLIKIM	17U	BES3	$e^+ e^- \to \gamma X$
9.22 ±0.11 ±0.46	72k	ATHAR	04	CLEO	$e^+ e^- \to \gamma X$
9.9 ±0.5 ±0.8		[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.

$\Gamma(\gamma\chi_{c1}(1P))/\Gamma_{total}$ — Γ_{167}/Γ

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
9.75 ±0.24 OUR FIT					
9.54 ±0.29 OUR AVERAGE					
9.905±0.011±0.353	5.0M	ABLIKIM	17U	BES3	$e^+e^- \to \gamma X$
9.07 ±0.11 ±0.54	76k	ATHAR	04	CLEO	$e^+e^- \to \gamma X$
9.0 ±0.5 ±0.7		[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.

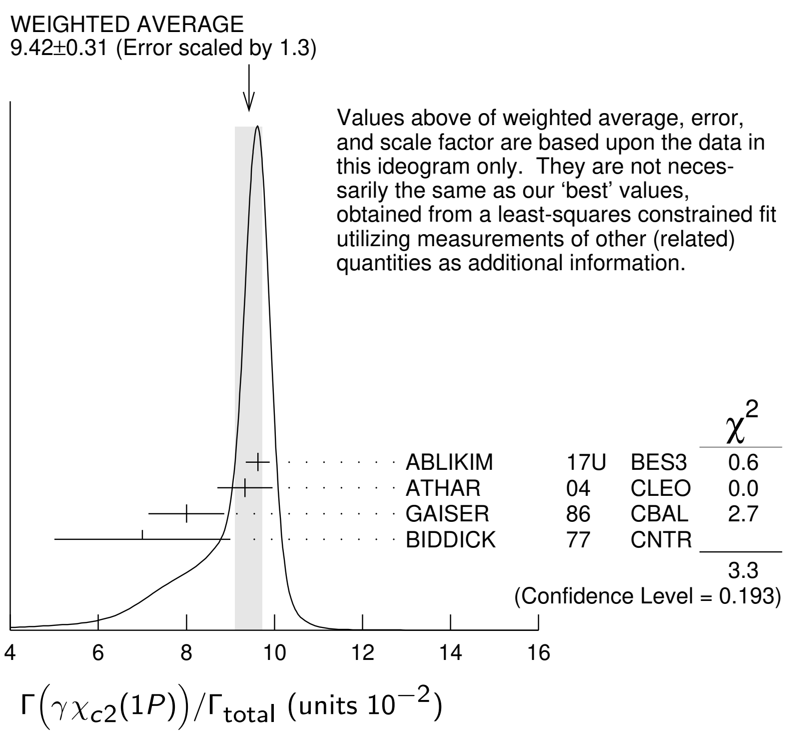
$\Gamma(\gamma\chi_{c0}(1P))/\Gamma(\gamma\chi_{c1}(1P))$ — $\Gamma_{166}/\Gamma_{167}$

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1.02±0.01±0.07	[1] ATHAR	04	CLEO	$e^+e^- \to \gamma X$

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

$\Gamma(\gamma\chi_{c2}(1P))/\Gamma_{total}$ — Γ_{168}/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±0.013±0.272	4.2M	ABLIKIM	17U	BES3	$e^+e^- \to \gamma X$
9.33 ±0.14 ±0.61	79k	ATHAR	04	CLEO	$e^+e^- \to \gamma X$
8.0 ±0.5 ±0.7		[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.

$[\Gamma(\gamma\chi_{c0}(1P)) + \Gamma(\gamma\chi_{c1}(1P)) + \Gamma(\gamma\chi_{c2}(1P))]/\Gamma_{total}$ $(\Gamma_{166}+\Gamma_{167}+\Gamma_{168})/\Gamma$

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($\gamma\chi_{cJ}$).

$\Gamma(\gamma\chi_{c0}(1P))/\Gamma(\gamma\chi_{c2}(1P))$ $\Gamma_{166}/\Gamma_{168}$

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($\gamma\chi_{cJ}$).

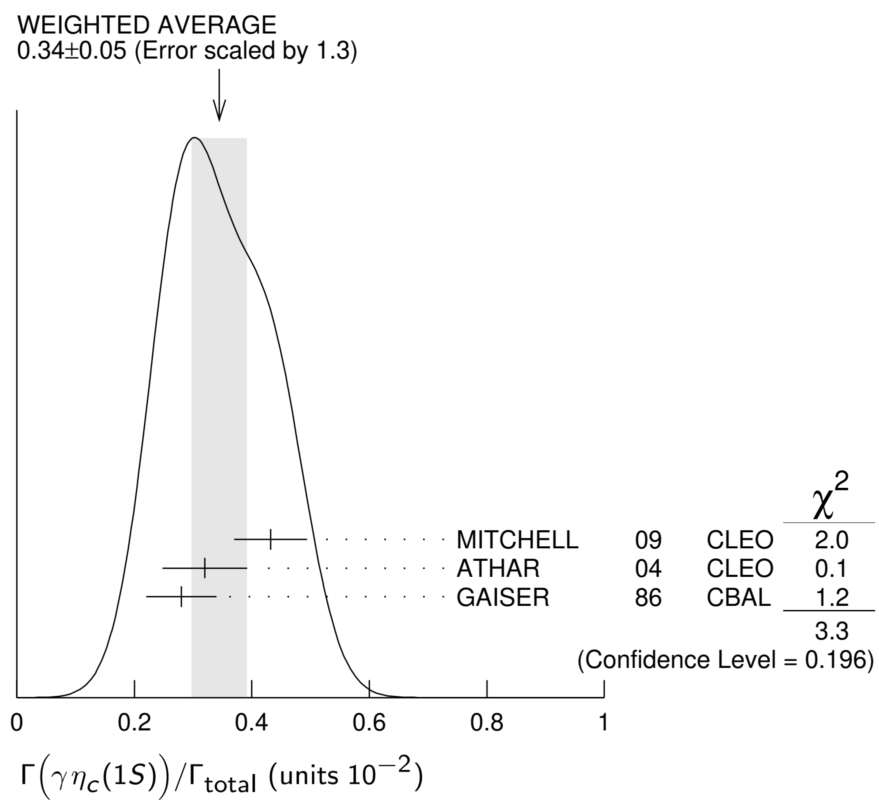
$\Gamma(\gamma\chi_{c2}(1P))/\Gamma(\gamma\chi_{c1}(1P))$ $\Gamma_{168}/\Gamma_{167}$

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($\gamma\chi_{cJ}$).

$\Gamma(\gamma\eta_c(1S))/\Gamma_{total}$ Γ_{169}/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 ±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 ± 4.5 MeV to obtain this result.

$\Gamma(\gamma\eta_c(2S))/\Gamma_{total}$ — Γ_{170}/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 $[\Gamma(\psi(2S) \to \gamma\eta_c(2S))/\Gamma_{total}] \times [B(\eta_c(2S) \to K\overline{K}\pi)] = (1.30 \pm 0.20 \pm 0.30) \times 10^{-5}$ 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 $[\Gamma(\psi(2S) \to \gamma\eta_c(2S))/\Gamma_{total}] \times [B(\eta_c(2S) \to K\overline{K}\pi)] < 14.5 \times 10^{-6}$ 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.

$\Gamma(\gamma\pi^0)/\Gamma_{total}$ — Γ_{171}/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^-
$< 1 \times 10^4$	90		WIIK	75	DASP	e^+e^-

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

$\Gamma(\gamma 2(\pi^+\pi^-))/\Gamma_{total}$ — Γ_{172}/Γ

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

$\Gamma(\gamma 3(\pi^+\pi^-))/\Gamma_{total}$ — Γ_{173}/Γ

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

$\Gamma(\gamma\eta'(958))/\Gamma_{total}$ — Γ_{174}/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	$e^+e^- \rightarrow \psi(2S)$
1.54 ±0.31 ±0.20	∼ 43	BAI	98F	BES	$\psi(2S) \rightarrow \pi^+\pi^-2\gamma$, $\pi^+\pi^-3\gamma$
• • • 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 $\eta' \rightarrow \pi^+\pi^-\eta$ and $\eta' \rightarrow \pi^+\pi^-\gamma$ decay modes.
[2] Restated by us using total decay width 228 keV.
[3] The value is normalized to the branching ratio for $\Gamma(J/\psi(1S)\eta)/\Gamma_{total}$.

$\Gamma(\gamma f_2(1270))/\Gamma_{total}$ Γ_{175}/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		$\psi(2S) \rightarrow \gamma\pi\pi$
$2.12\pm0.19\pm0.32$		[3,4] BAI	03C	BES	$\psi(2S) \rightarrow \gamma\pi\pi$
• • • 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	$\psi(2S) \rightarrow \gamma\pi^+\pi^-$
$2.90\pm1.08\pm1.07$	29.9 ± 11.1	[3] BAI	03C	BES	$\psi(2S) \rightarrow \gamma\pi^0\pi^0$

[1] Using CLEO-c data but not authored by the CLEO Collaboration.
[2] DOBBS 15 reports $[\Gamma(\psi(2S) \rightarrow \gamma f_2(1270))/\Gamma_{total}] \times [B(f_2(1270) \rightarrow \pi\pi)] = (2.39 \pm 0.09 \pm 0.09) \times 10^{-4}$ which we divide by our best value $B(f_2(1270) \rightarrow \pi\pi) = (84.3^{+2.9}_{-0.9}) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.
[3] Normalized to $B(\psi(2S) \rightarrow J/\psi\pi^+\pi^-) = 0.305 \pm 0.016$.
[4] Combining the results from $\pi^+\pi^-$ and $\pi^0\pi^0$ decay modes.

$\Gamma(\gamma f_0(1370) \rightarrow \gamma K\overline{K})/\Gamma_{total}$ Γ_{176}/Γ

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

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

$\Gamma(\gamma f_0(1500))/\Gamma_{total}$ Γ_{177}/Γ

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

[1] DOBBS 15 reports $[\Gamma(\psi(2S) \rightarrow \gamma f_0(1500))/\Gamma_{total}] \times [B(f_0(1500) \rightarrow \pi\pi)] = (3.2 \pm 0.6 \pm 0.2) \times 10^{-5}$ which we divide by our best value $B(f_0(1500) \rightarrow \pi\pi) = (34.5 \pm 2.2) \times 10^{-2}$. 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.

$\Gamma(\gamma f_2'(1525))/\Gamma_{total}$ — Γ_{178}/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.

$\Gamma(\gamma f_0(1710) \to \gamma\pi\pi)/\Gamma_{total}$ — Γ_{180}/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 $B(\psi(2S) \to J/\psi\pi^+\pi^-) = 0.305 \pm 0.016$.

$\Gamma(\gamma f_0(1710) \to \gamma K\overline{K})/\Gamma_{total}$ — Γ_{181}/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	$\psi(2S) \to \gamma K^0_S K^0_S$

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

[2] Includes unknown branching fractions to K^+K^- or $K^0_S K^0_S$. We have multiplied the K^+K^- result by a factor of 2 and the $K^0_S K^0_S$ result by a factor of 4 to obtain the $K\overline{K}$ result.

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

$\Gamma(\gamma f_0(2100) \to \gamma\pi\pi)/\Gamma_{total}$ — Γ_{182}/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.

$\Gamma(\gamma f_0(2200) \to \gamma K\overline{K})/\Gamma_{total}$ — Γ_{183}/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.

$\Gamma(\gamma f_J(2220) \to \gamma\pi\pi)/\Gamma_{total}$ — Γ_{184}/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.

$\Gamma(\gamma f_J(2220) \to \gamma K\overline{K})/\Gamma_{total}$ — Γ_{185}/Γ

VALUE	CL%	DOCUMENT ID		COMMENT
$<9.5 \times 10^{-6}$	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 $K^0_S K^0_S$ are $2.1/4.3\times10^{-6}$ and $3.7/5.5 \times 10^{-6}$, respectively.

$\Gamma(\gamma\eta)/\Gamma_{total}$ — Γ_{186}/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. • • •

VALUE (units 10^{-6})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
< 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.

$\Gamma(\gamma\eta\pi^+\pi^-)/\Gamma_{total}$ — Γ_{187}/Γ

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

$\Gamma(\gamma\eta(1405) \to \gamma K\overline{K}\pi)/\Gamma_{total}$ — Γ_{189}/Γ

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

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

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<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 $\eta(1405) \to K\overline{K}\pi$.

$\Gamma(\gamma\eta(1405) \to \gamma\eta\pi^+\pi^-)/\Gamma_{total}$ — Γ_{190}/Γ

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

$\Gamma(\gamma\eta(1405) \to \gamma f_0(980)\pi^0 \to \gamma\pi^+\pi^-\pi^0)/\Gamma_{total}$ — Γ_{191}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<5.0 \times 10^{-7}$	90	ABLIKIM	17AJ	BES3	$\psi(2S) \to \gamma\pi^+\pi^-\pi^0$

$\Gamma(\gamma\eta(1475) \to \gamma K\overline{K}\pi)/\Gamma_{total}$ — Γ_{193}/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. • • •

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<1.5	90	ABLIKIM	06R	BES2	$\psi(2S) \to \gamma K^0_S K^+\pi^- +$ c.c.

$\Gamma(\gamma\eta(1475) \to \gamma\eta\pi^+\pi^-)/\Gamma_{total}$ — Γ_{194}/Γ

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

$\Gamma(\gamma K^{*0} K^+\pi^- + c.c.)/\Gamma_{total}$ — Γ_{195}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
37.0±6.1±7.2	237	ABLIKIM	07D	BES2	$e^+e^- \to \psi(2S)$

$\Gamma(\gamma K^{*0}\overline{K}^{*0})/\Gamma_{total}$ — Γ_{196}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
24.0±4.5±5.0	41	ABLIKIM	07D	BES2	$e^+e^- \to \psi(2S)$

$\Gamma(\gamma K^0_S K^+\pi^- + c.c.)/\Gamma_{total}$ — Γ_{197}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
25.6±3.6±3.6	115	ABLIKIM	07D	BES2	$e^+e^- \to \psi(2S)$

$\Gamma(\gamma K^+K^-\pi^+\pi^-)/\Gamma_{total}$ — Γ_{198}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
19.1±2.7±4.3	132	ABLIKIM	07D	BES2	$e^+e^- \to \psi(2S)$

$\Gamma(\gamma K^+K^- 2(\pi^+\pi^-))/\Gamma_{total}$ — Γ_{199}/Γ

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

$\Gamma(\gamma 2(K^+K^-))/\Gamma_{total}$ — Γ_{200}/Γ

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

$\Gamma(\gamma p\overline{p})/\Gamma_{total}$ — Γ_{201}/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±0.26±0.18	348	[1] ALEXANDER	10	CLEO	$\psi(2S) \to \gamma p\overline{p}$
2.9 ±0.4 ±0.4	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.

$\Gamma(\gamma f_2(1950) \to \gamma p\overline{p})/\Gamma_{total}$ — Γ_{202}/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.

$\Gamma(\gamma f_2(2150) \to \gamma p\overline{p})/\Gamma_{total}$ — Γ_{203}/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.

$\Gamma(\gamma X(1835) \to \gamma p\overline{p})/\Gamma_{total}$ — Γ_{204}/Γ

VALUE (units 10^{-6})	CL%	DOCUMENT ID		TECN	COMMENT
$4.57 \pm 0.36 ^{+1.77}_{-4.26}$		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	$\psi(2S) \to \gamma p\overline{p}$

$\Gamma(\gamma X \to \gamma p\overline{p})/\Gamma_{total}$ — Γ_{205}/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	$\psi(2S) \to \gamma p\overline{p}$

$\Gamma(\gamma p\overline{p}\pi^+\pi^-)/\Gamma_{total}$ — Γ_{206}/Γ

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

$\Gamma(\gamma\gamma J/\psi)/\Gamma_{total}$ — Γ_{208}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
$3.1 \pm 0.6 ^{+0.8}_{-1.0}$	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.

$\Gamma(e^+e^-\eta')/\Gamma_{total}$ — Γ_{209}/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	$\psi(2S) \to \eta' e^+e^-$, $\eta' \to \eta\pi^+\pi^-$

$\Gamma(e^+e^-\eta_c(1S))/\Gamma_{total}$ — Γ_{210}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
3.77±0.40±0.18	3k	[1] ABLIKIM	22AX	BES3	$e^+e^- \to \psi(2S)$

[1] From a fit to the recoil mass distribution of e^+e^- with inclusive $\eta_c(1S)$ decays.

$\Gamma(e^+e^-\chi_{c0}(1P))/\Gamma_{total}$ — Γ_{211}/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 $[\Gamma(\psi(2S) \to e^+e^-\chi_{c0}(1P))/\Gamma_{total}] \times [B(\chi_{c0}(1P) \to \gamma J/\psi(1S))]$ 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.

$\Gamma(e^+e^-\chi_{c0}(1P))/\Gamma(\gamma\chi_{c0}(1P))$ — $\Gamma_{211}/\Gamma_{166}$

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.

$\Gamma(e^+e^-\chi_{c1}(1P))/\Gamma_{total}$ — Γ_{212}/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 $[\Gamma(\psi(2S) \to e^+e^-\chi_{c1}(1P))/\Gamma_{total}] \times [B(\chi_{c1}(1P) \to \gamma J/\psi(1S))]$ 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.

$\Gamma(e^+e^-\chi_{c1}(1P))/\Gamma(\gamma\chi_{c1}(1P))$ — $\Gamma_{212}/\Gamma_{167}$

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.

$\Gamma(e^+e^-\chi_{c2}(1P))/\Gamma_{total}$ — Γ_{213}/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 $[\Gamma(\psi(2S) \to e^+e^-\chi_{c2}(1P))/\Gamma_{total}] \times [B(\chi_{c2}(1P) \to \gamma J/\psi(1S))]$ 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.

$\Gamma(e^+e^-\chi_{c2}(1P))/\Gamma(\gamma\chi_{c2}(1P))$ — $\Gamma_{213}/\Gamma_{168}$

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

$\Gamma(D^0 e^+ e^- + \text{c.c.})/\Gamma_{\text{total}}$ — Γ_{214}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<1.4 × 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 $K^- \pi^+ \pi^+ \pi^-$.

$\Gamma(\Lambda_c^+ \overline{\Sigma}^- + \text{c.c.})/\Gamma_{\text{total}}$ — Γ_{215}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<1.4 × 10^{-5}	90	[1] ABLIKIM	23	BES3	$e^+ e^- \to \psi(2S)$

[1] Using $\Lambda_c^+ \to p K^- \pi^+$ and $\overline{\Sigma}^- \to \overline{p} \pi^0$.

OTHER DECAYS

$\Gamma(\text{invisible})/\Gamma(e^+ e^-)$ — Γ_{216}/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($\psi(2S) \to \gamma \chi_{cJ}(1P)$)×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	23	CP C47 013002	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	22AP	PR D106 072006	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	22AQ	PR D106 072007	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	22AV	JHEP 2212 016	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	22AX	PR D106 112002	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	22AY	PR D106 112007	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	22AZ	PR D106 112011	M. Ablikim *et al.*	(BESIII Collab.)
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)