$\psi(2S)$

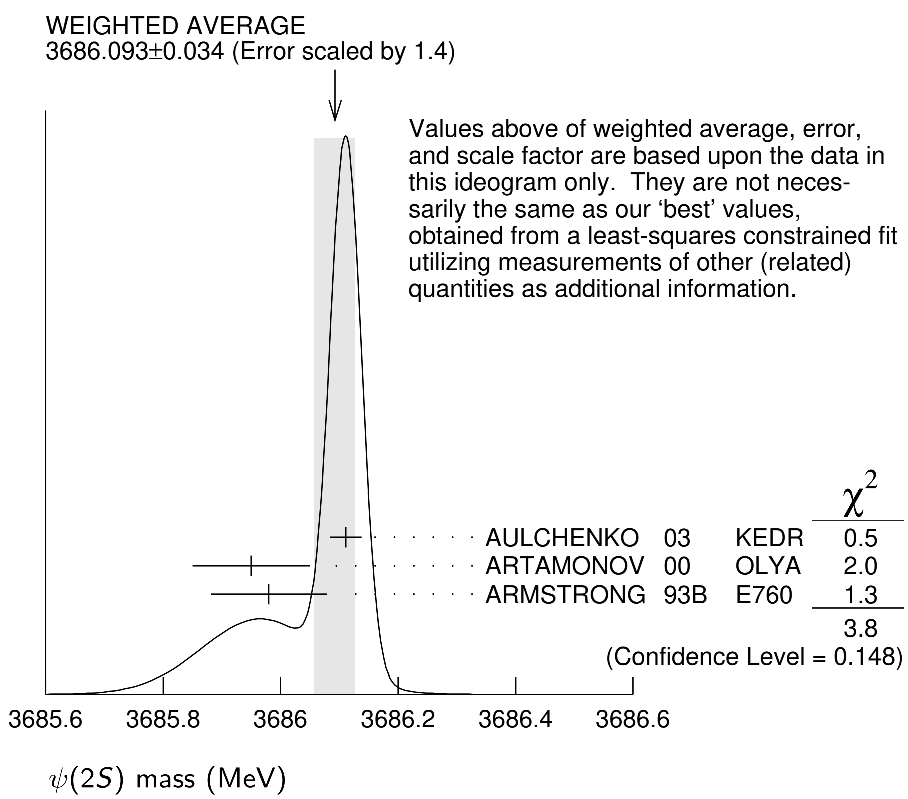
$I^G(J^{PC}) = 0^-(1^{--})$

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

$\psi(2S)$ MASS

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
3686.09 ±0.04 OUR FIT Error includes scale factor of 1.6.				
3686.093±0.034 OUR AVERAGE Error includes scale factor of 1.4. See the ideogram below.				
3686.111±0.025±0.009		AULCHENKO 03	KEDR	$e^+e^- \rightarrow$ hadrons
3685.95 ±0.10	413	[1] ARTAMONOV 00	OLYA	$e^+e^- \rightarrow$ hadrons
3685.98 ±0.09 ±0.04		[2] ARMSTRONG 93B	E760	$\overline{p}p \rightarrow e^+e^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
3686.00 ±0.10	413	[3] ZHOLENTZ 80	OLYA	e^+e^-

[1] Reanalysis of ZHOLENTZ 80 using new electron mass (COHEN 87) and radiative corrections (KURAEV 85).
[2] 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.
[3] Superseded by ARTAMONOV 00.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	[4] AULCHENKO	03	KEDR	$e^+e^- \rightarrow$ hadrons
589.7 ±1.2	LEMOIGNE	82	GOLI	185 π^- Be $\rightarrow \gamma\mu^+\mu^-$ A
589.07 ±0.13	[4] 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	[5] BAI	98E	BES	e^+e^-

[4] Redundant with data in mass above.
[5] Systematic errors not evaluated.

$\psi(2S)$ WIDTH

VALUE (keV)	DOCUMENT ID		TECN	COMMENT
327±11 OUR FIT				
284±21 OUR AVERAGE				
331±58± 2	ABLIKIM	06L	BES2	$e^+e^- \rightarrow$ hadrons
264±27	[6] BAI	02B	BES2	e^+e^-
306±36±16	ARMSTRONG	93B	E760	$\overline{p}p \rightarrow e^+e^-$

[6] 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.

$\psi(2S)$ DECAY MODES

	Mode	Fraction (Γ_i/Γ)	Scale factor/ Confidence level
Γ_1	hadrons	(97.85±0.13) %	
Γ_2	virtual $\gamma \rightarrow$ hadrons	(1.73±0.14) %	S=1.5
Γ_3	light hadrons		
Γ_4	e^+e^-	(7.43±0.18) $\times 10^{-3}$	
Γ_5	$\mu^+\mu^-$	(7.4 ±0.8) $\times 10^{-3}$	
Γ_6	$\tau^+\tau^-$	(3.0 ±0.4) $\times 10^{-3}$	
	Decays into $J/\psi(1S)$ and anything		
Γ_7	$J/\psi(1S)$ anything	(56.9 ±0.9) %	
Γ_8	$J/\psi(1S)$ neutrals	(23.3 ±0.4) %	
Γ_9	$J/\psi(1S)\pi^+\pi^-$	(32.3 ±0.5) %	
Γ_{10}	$J/\psi(1S)\pi^0\pi^0$	(16.68±0.34) %	
Γ_{11}	$J/\psi(1S)\eta$	(3.13±0.08) %	
Γ_{12}	$J/\psi(1S)\pi^0$	(1.26±0.13) $\times 10^{-3}$	S=1.3

Hadronic decays

Γ_{13}	$3(\pi^+\pi^-)\pi^0$	$(3.5 \pm 1.6) \times 10^{-3}$	
Γ_{14}	$2(\pi^+\pi^-)\pi^0$	$(2.66 \pm 0.29) \times 10^{-3}$	
Γ_{15}	$\rho a_2(1320)$	$(2.6 \pm 0.9) \times 10^{-4}$	
Γ_{16}	$p\overline{p}$	$(2.85 \pm 0.23) \times 10^{-4}$	S=1.6
Γ_{17}	$\Delta^{++}\overline{\Delta}^{--}$	$(1.28 \pm 0.35) \times 10^{-4}$	
Γ_{18}	$\Lambda\overline{\Lambda}$	$(2.8 \pm 0.5) \times 10^{-4}$	S=2.6
Γ_{19}	$\Sigma^+\overline{\Sigma}^-$	$(2.6 \pm 0.8) \times 10^{-4}$	
Γ_{20}	$\Sigma^0\overline{\Sigma}^0$	$(2.2 \pm 0.4) \times 10^{-4}$	S=1.5
Γ_{21}	$\Sigma(1385)^+\overline{\Sigma}(1385)^-$	$(1.1 \pm 0.4) \times 10^{-4}$	
Γ_{22}	$\Xi^-\overline{\Xi}^+$	$(1.8 \pm 0.6) \times 10^{-4}$	S=2.8
Γ_{23}	$\Xi^0\overline{\Xi}^0$	$(2.8 \pm 0.9) \times 10^{-4}$	
Γ_{24}	$\Xi(1530)^0\overline{\Xi}(1530)^0$	$< 8.1 \times 10^{-5}$	CL=90%
Γ_{25}	$\Omega^-\overline{\Omega}^+$	$< 7.3 \times 10^{-5}$	CL=90%
Γ_{26}	$\pi^0 p\overline{p}$	$(1.33 \pm 0.17) \times 10^{-4}$	
Γ_{27}	$\eta p\overline{p}$	$(6.0 \pm 1.2) \times 10^{-5}$	
Γ_{28}	$\omega p\overline{p}$	$(6.9 \pm 2.1) \times 10^{-5}$	
Γ_{29}	$\phi p\overline{p}$	$< 2.4 \times 10^{-5}$	CL=90%
Γ_{30}	$\pi^+\pi^- p\overline{p}$	$(6.0 \pm 0.4) \times 10^{-4}$	
Γ_{31}	$p\overline{n}\pi^-$ or c.c.	$(2.48 \pm 0.17) \times 10^{-4}$	
Γ_{32}	$p\overline{n}\pi^-\pi^0$	$(3.2 \pm 0.7) \times 10^{-4}$	
Γ_{33}	$2(\pi^+\pi^-\pi^0)$	$(4.6 \pm 1.5) \times 10^{-3}$	
Γ_{34}	$\eta\pi^+\pi^-$	$< 1.6 \times 10^{-4}$	CL=90%
Γ_{35}	$\eta\pi^+\pi^-\pi^0$	$(9.5 \pm 1.7) \times 10^{-4}$	
Γ_{36}	$\eta'\pi^+\pi^-\pi^0$	$(4.5 \pm 2.1) \times 10^{-4}$	
Γ_{37}	$\omega\pi^+\pi^-$	$(6.6 \pm 1.7) \times 10^{-4}$	S=2.7
Γ_{38}	$b_1^{\pm}\pi^{\mp}$	$(3.6 \pm 0.6) \times 10^{-4}$	
Γ_{39}	$b_1^0\pi^0$	$(2.4 \pm 0.6) \times 10^{-4}$	
Γ_{40}	$\omega f_2(1270)$	$(2.0 \pm 0.6) \times 10^{-4}$	
Γ_{41}	$\pi^+\pi^- K^+ K^-$	$(7.2 \pm 0.5) \times 10^{-4}$	
Γ_{42}	$\rho^0 K^+ K^-$	$(2.2 \pm 0.4) \times 10^{-4}$	
Γ_{43}	$K^*(892)^0\overline{K}_2^*(1430)^0$	$(1.9 \pm 0.5) \times 10^{-4}$	
Γ_{44}	$K^+K^- 2(\pi^+\pi^-)$	$(1.8 \pm 0.9) \times 10^{-3}$	
Γ_{45}	$K_1(1270)^{\pm} K^{\mp}$	$(1.00 \pm 0.28) \times 10^{-3}$	
Γ_{46}	$K_S^0 K_S^0 \pi^+\pi^-$	$(2.2 \pm 0.4) \times 10^{-4}$	
Γ_{47}	$\rho^0 p\overline{p}$	$(5.0 \pm 2.2) \times 10^{-5}$	
Γ_{48}	$K^+\overline{K}^*(892)^0\pi^- +$ c.c.	$(6.7 \pm 2.5) \times 10^{-4}$	
Γ_{49}	$2(\pi^+\pi^-)$	$(2.4 \pm 0.6) \times 10^{-4}$	S=2.2
Γ_{50}	$\rho^0\pi^+\pi^-$	$(2.2 \pm 0.6) \times 10^{-4}$	S=1.4
Γ_{51}	$K^+K^-\pi^+\pi^-\pi^0$	$(1.24 \pm 0.10) \times 10^{-3}$	
Γ_{52}	$\omega f_0(1710) \to \omega K^+ K^-$	$(5.9 \pm 2.2) \times 10^{-5}$	
Γ_{53}	$K^*(892)^0 K^-\pi^+\pi^0 +$ c.c.	$(8.6 \pm 2.2) \times 10^{-4}$	
Γ_{54}	$K^*(892)^+ K^-\pi^+\pi^- +$ c.c.	$(9.6 \pm 2.8) \times 10^{-4}$	
Γ_{55}	$K^*(892)^+ K^-\rho^0 +$ c.c.	$(7.3 \pm 2.6) \times 10^{-4}$	

Γ_{56}	$K^*(892)^0 K^- \rho^+$ + c.c.	$(6.1 \pm 1.8) \times 10^{-4}$	
Γ_{57}	$\eta K^+ K^-$	$< 1.3 \times 10^{-4}$	CL=90%
Γ_{58}	$\omega K^+ K^-$	$(1.85 \pm 0.25) \times 10^{-4}$	S=1.1
Γ_{59}	$3(\pi^+ \pi^-)$	$(3.5 \pm 2.0) \times 10^{-4}$	S=2.8
Γ_{60}	$p \overline{p} \pi^+ \pi^- \pi^0$	$(7.3 \pm 0.7) \times 10^{-4}$	
Γ_{61}	$K^+ K^-$	$(6.3 \pm 0.7) \times 10^{-5}$	
Γ_{62}	$K^0_S K^0_L$	$(5.4 \pm 0.5) \times 10^{-5}$	
Γ_{63}	$\pi^+ \pi^- \pi^0$	$(1.68 \pm 0.26) \times 10^{-4}$	S=1.4
Γ_{64}	$\rho(2150)\pi \rightarrow \pi^+ \pi^- \pi^0$	$(1.9 {}^{+1.2}_{-0.4}) \times 10^{-4}$	
Γ_{65}	$\rho(770)\pi \rightarrow \pi^+ \pi^- \pi^0$	$(3.2 \pm 1.2) \times 10^{-5}$	S=1.8
Γ_{66}	$\pi^+ \pi^-$	$(8 \pm 5) \times 10^{-5}$	
Γ_{67}	$K_1(1400)^{\pm} K^{\mp}$	$< 3.1 \times 10^{-4}$	CL=90%
Γ_{68}	$K^+ K^- \pi^0$	$< 2.96 \times 10^{-5}$	CL=90%
Γ_{69}	$K^+ \overline{K}^*(892)^-$ + c.c.	$(1.7 {}^{+0.8}_{-0.7}) \times 10^{-5}$	
Γ_{70}	$K^*(892)^0 \overline{K}^0$ + c.c.	$(1.09 \pm 0.20) \times 10^{-4}$	
Γ_{71}	$\phi \pi^+ \pi^-$	$(1.13 \pm 0.29) \times 10^{-4}$	S=1.7
Γ_{72}	$\phi f_0(980) \rightarrow \pi^+ \pi^-$	$(6.0 \pm 2.2) \times 10^{-5}$	
Γ_{73}	$2(K^+ K^-)$	$(6.0 \pm 1.4) \times 10^{-5}$	
Γ_{74}	$\phi K^+ K^-$	$(7.0 \pm 1.6) \times 10^{-5}$	
Γ_{75}	$2(K^+ K^-)\pi^0$	$(1.10 \pm 0.28) \times 10^{-4}$	
Γ_{76}	$\phi \eta$	$(2.8 {}^{+1.0}_{-0.8}) \times 10^{-5}$	
Γ_{77}	$\phi \eta'$	$(3.1 \pm 1.6) \times 10^{-5}$	
Γ_{78}	$\omega \eta'$	$(3.2 {}^{+2.5}_{-2.1}) \times 10^{-5}$	
Γ_{79}	$\omega \pi^0$	$(2.1 \pm 0.6) \times 10^{-5}$	
Γ_{80}	$\rho \eta'$	$(1.9 {}^{+1.7}_{-1.2}) \times 10^{-5}$	
Γ_{81}	$\rho \eta$	$(2.2 \pm 0.6) \times 10^{-5}$	S=1.1
Γ_{82}	$\omega \eta$	$< 1.1 \times 10^{-5}$	CL=90%
Γ_{83}	$\phi \pi^0$	$< 4 \times 10^{-6}$	CL=90%
Γ_{84}	$\eta_c \pi^+ \pi^- \pi^0$	$< 1.0 \times 10^{-3}$	CL=90%
Γ_{85}	$p \overline{p} K^+ K^-$	$(2.7 \pm 0.7) \times 10^{-5}$	
Γ_{86}	$\Lambda \overline{\Lambda} \pi^+ \pi^-$	$(2.8 \pm 0.6) \times 10^{-4}$	
Γ_{87}	$\Lambda \overline{p} K^+$	$(1.00 \pm 0.14) \times 10^{-4}$	
Γ_{88}	$\Lambda \overline{p} K^+ \pi^+ \pi^-$	$(1.8 \pm 0.4) \times 10^{-4}$	
Γ_{89}	$\phi f'_2(1525)$	$(4.4 \pm 1.6) \times 10^{-5}$	
Γ_{90}	$\Theta(1540)\overline{\Theta}(1540) \rightarrow K^0_S p K^- \overline{n}$ + c.c.	$< 8.8 \times 10^{-6}$	CL=90%
Γ_{91}	$\Theta(1540) K^- \overline{n} \rightarrow K^0_S p K^- \overline{n}$	$< 1.0 \times 10^{-5}$	CL=90%
Γ_{92}	$\Theta(1540) K^0_S \overline{p} \rightarrow K^0_S \overline{p} K^+ n$	$< 7.0 \times 10^{-6}$	CL=90%
Γ_{93}	$\overline{\Theta}(1540) K^+ n \rightarrow K^0_S \overline{p} K^+ n$	$< 2.6 \times 10^{-5}$	CL=90%
Γ_{94}	$\overline{\Theta}(1540) K^0_S p \rightarrow K^0_S p K^- \overline{n}$	$< 6.0 \times 10^{-6}$	CL=90%
Γ_{95}	$K^0_S K^0_S$	$< 4.6 \times 10^{-6}$	

Radiative decays

Γ_{96}	$\gamma \chi_{c0}(1P)$	(9.3 ± 0.4) %	
Γ_{97}	$\gamma \chi_{c1}(1P)$	(8.8 ± 0.4) %	
Γ_{98}	$\gamma \chi_{c2}(1P)$	(8.1 ± 0.4) %	
Γ_{99}	$\gamma \eta_c(1S)$	$(3.0 \pm 0.5) \times 10^{-3}$	
Γ_{100}	$\gamma \eta_c(2S)$	$< 2.0 \times 10^{-3}$	CL=90%
Γ_{101}	$\gamma \pi^0$	$< 5.4 \times 10^{-3}$	CL=95%
Γ_{102}	$\gamma \eta'(958)$	$(1.36 \pm 0.24) \times 10^{-4}$	
Γ_{103}	$\gamma f_2(1270)$	$(2.1 \pm 0.4) \times 10^{-4}$	
Γ_{104}	$\gamma f_0(1710)$		
Γ_{105}	$\gamma f_0(1710) \rightarrow \gamma \pi \pi$	$(3.0 \pm 1.3) \times 10^{-5}$	
Γ_{106}	$\gamma f_0(1710) \rightarrow \gamma K \overline{K}$	$(6.0 \pm 1.6) \times 10^{-5}$	
Γ_{107}	$\gamma \gamma$	$< 1.3 \times 10^{-4}$	CL=90%
Γ_{108}	$\gamma \eta$	$< 9 \times 10^{-5}$	CL=90%
Γ_{109}	$\gamma \eta \pi^+ \pi^-$	$(8.7 \pm 2.1) \times 10^{-4}$	
Γ_{110}	$\gamma \eta(1405)$		
Γ_{111}	$\gamma \eta(1405) \rightarrow \gamma K \overline{K} \pi$	$< 9 \times 10^{-5}$	CL=90%
Γ_{112}	$\gamma \eta(1405) \rightarrow \eta \pi^+ \pi^-$	$(3.6 \pm 2.5) \times 10^{-5}$	
Γ_{113}	$\gamma \eta(1475)$		
Γ_{114}	$\gamma \eta(1475) \rightarrow K \overline{K} \pi$	$< 1.4 \times 10^{-4}$	CL=90%
Γ_{115}	$\gamma \eta(1475) \rightarrow \eta \pi^+ \pi^-$	$< 8.8 \times 10^{-5}$	CL=90%

$\psi(2S)$ 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_4

VALUE (keV)	DOCUMENT ID		TECN	COMMENT
2.43 ±0.05 OUR FIT				
2.29 ±0.10 OUR AVERAGE				
$2.330 \pm 0.036 \pm 0.110$	ABLIKIM	06L	BES2	$e^+ e^- \rightarrow$ hadrons
2.14 ± 0.21	ALEXANDER	89	RVUE	See Υ mini-review
• • • We do not use the following data for averages, fits, limits, etc. • • •				
2.44 ± 0.21	[7] BAI	02B	BES2	$e^+ e^-$
2.0 ± 0.3	BRANDELIK	79C	DASP	$e^+ e^-$
2.1 ± 0.3	[8] LUTH	75	MRK1	$e^+ e^-$

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

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

$\Gamma(\gamma\gamma)$ Γ_{107}

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

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

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

$\Gamma(\text{hadrons}) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ $\Gamma_1\Gamma_4/\Gamma$

VALUE (keV)	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
2.2 ± 0.4	ABRAMS	75	MRK1	e^+e^-

$\Gamma(\tau^+\tau^-) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ $\Gamma_6\Gamma_4/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
9.0 ± 2.6	79	[9] ANASHIN	07	KEDR	$e^+e^- \to \psi(2S) \to \tau^+\tau^-$

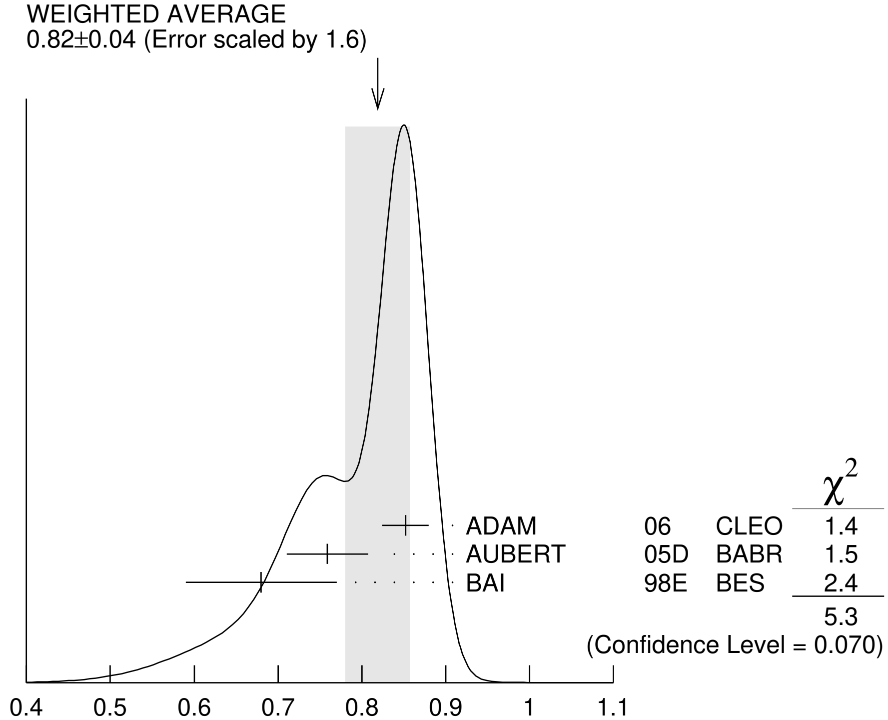
[9] Using $\psi(2S)$ total width of 337 ± 13 keV. Systematic errors not evaluated.

$\Gamma(J/\psi(1S)\pi^+\pi^-) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ $\Gamma_9\Gamma_4/\Gamma$

VALUE (keV)	EVTS	DOCUMENT ID		TECN	COMMENT
0.785±0.017 OUR FIT					
0.82 ±0.04 OUR AVERAGE Error includes scale factor of 1.6. See the ideogram below.					
$0.852\pm0.010\pm0.026$	19.5k±243	ADAM	06	CLEO	$3.773\ e^+e^- \to \gamma\psi(2S)$
$0.76\pm0.05\pm0.01$	544	[10] AUBERT	05D	BABR	$10.6\ e^+e^- \to \pi^+\pi^-\mu^+\mu^-\gamma$
0.68 ± 0.09		[11] BAI	98E	BES	e^+e^-

[10] AUBERT 05D reports $[\Gamma(\psi(2S) \to e^+e^-)\ B(\psi(2S) \to J/\psi\pi^+\pi^-)] \times B(J/\psi \to \mu^+\mu^-) = (0.0450 \pm 0.0018 \pm 0.0022)$ keV. We divide by our best value $B(J/\psi \to \mu^+\mu^-) = (5.93 \pm 0.06) \times 10^{-2}$. Our first error is the total experiment's error and our second error is the systematic error from using our best value.

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



$\Gamma\big(J/\psi(1S)\pi^+\pi^-\big) \times \Gamma\big(e^+e^-\big)/\Gamma_{\text{total}}$ $\Gamma_9\Gamma_4/\Gamma$

$\Gamma\big(J/\psi(1S)\pi^0\pi^0\big) \times \Gamma\big(e^+e^-\big)/\Gamma_{\text{total}}$ $\Gamma_{10}\Gamma_4/\Gamma$

VALUE (keV)	EVTS	DOCUMENT ID		TECN	COMMENT
0.405±0.010 OUR FIT					
0.411±0.008±0.018	3.6k±96	ADAM	06	CLEO	3.773 $e^+e^- \rightarrow \gamma\psi(2S)$

$\Gamma\big(J/\psi(1S)\eta\big) \times \Gamma\big(e^+e^-\big)/\Gamma_{\text{total}}$ $\Gamma_{11}\Gamma_4/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID		TECN	COMMENT
76.1±2.2 OUR FIT					
88 ±6 ±7	291 ± 24	ADAM	06	CLEO	3.773 $e^+e^- \rightarrow \gamma\psi(2S)$

$\Gamma\big(J/\psi(1S)\pi^0\big) \times \Gamma\big(e^+e^-\big)/\Gamma_{\text{total}}$ $\Gamma_{12}\Gamma_4/\Gamma$

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

$\Gamma\big(p\overline{p}\big) \times \Gamma\big(e^+e^-\big)/\Gamma_{\text{total}}$ $\Gamma_{16}\Gamma_4/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID		COMMENT
0.70±0.17±0.03	22	AUBERT	06B	$e^+e^- \rightarrow p\overline{p}\gamma$

$\Gamma\big(2(\pi^+\pi^-\pi^0)\big) \times \Gamma\big(e^+e^-\big)/\Gamma_{\text{total}}$ $\Gamma_{33}\Gamma_4/\Gamma$

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

$\Gamma\big(K^+K^-2(\pi^+\pi^-)\big) \times \Gamma\big(e^+e^-\big)/\Gamma_{\text{total}}$ $\Gamma_{44}\Gamma_4/\Gamma$

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

$\Gamma(\phi\pi^+\pi^-) \times \Gamma(e^+e^-)/\Gamma_{total}$ — $\Gamma_{71}\Gamma_4/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID		TECN	COMMENT
0.57±0.23±0.01	10	[12] AUBERT,BE	06D	BABR	10.6 $e^+e^- \to K^+K^-\pi^+\pi^-\gamma$

[12] AUBERT,BE 06D reports [B($\psi(2S) \to e^+e^-$ + $\psi(2S) \to \phi\pi^+\pi^-$) × B($\phi(1020) \to K^+K^-$)] = 0.28 ± 0.11 ± 0.02. We divide by our best value B($\phi(1020) \to K^+K^-$) = (49.3 ± 0.6) × 10^{-2}. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\psi(2S)$ BRANCHING RATIOS

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

VALUE	DOCUMENT ID		TECN	COMMENT
0.9785±0.0013 OUR AVERAGE				
0.9779±0.0015	[13] BAI	02B	BES2	e^+e^-
0.981 ±0.003	[13] LUTH	75	MRK1	e^+e^-

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

$\Gamma(\text{virtual}\gamma \to \text{hadrons})/\Gamma_{total}$ — 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	[14,15] SETH	04	RVUE	e^+e^-
0.0199±0.0019	[14] BAI	02B	BES2	e^+e^-
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.029 ±0.004	[14] LUTH	75	MRK1	e^+e^-

[14] Included in $\Gamma(\text{hadrons})/\Gamma_{total}$.

[15] Using B($\psi(2S) \to \ell^+\ell^-$) = (0.73 ± 0.04)% from RPP-2002 and R = 2.28 ± 0.04 determined by a fit to data from BAI 00 and BAI 02C.

$\Gamma(\text{light hadrons})/\Gamma_{total}$ — Γ_3/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.169±0.026	[16] ADAM	05A	CLEO	$e^+e^- \to \psi(2S)$

[16] 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.

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

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
74.3± 1.8 OUR FIT				
• • • We do not use the following data for averages, fits, limits, etc. • • •				
88 ±13	[17] FELDMAN	77	RVUE	e^+e^-

[17] 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_5/Γ

VALUE (units 10^{-4})	DOCUMENT ID
74±8 OUR FIT	

$\Gamma(\mu^+\mu^-)/\Gamma(e^+e^-)$ — Γ_5/Γ_4

VALUE	DOCUMENT ID		TECN	COMMENT
1.00±0.11 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_6/Γ

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
30 ±4 OUR FIT				
30.8±2.1±3.8	[18] ABLIKIM	06W	BES	$e^+e^- \to \psi(2S)$

[18] 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

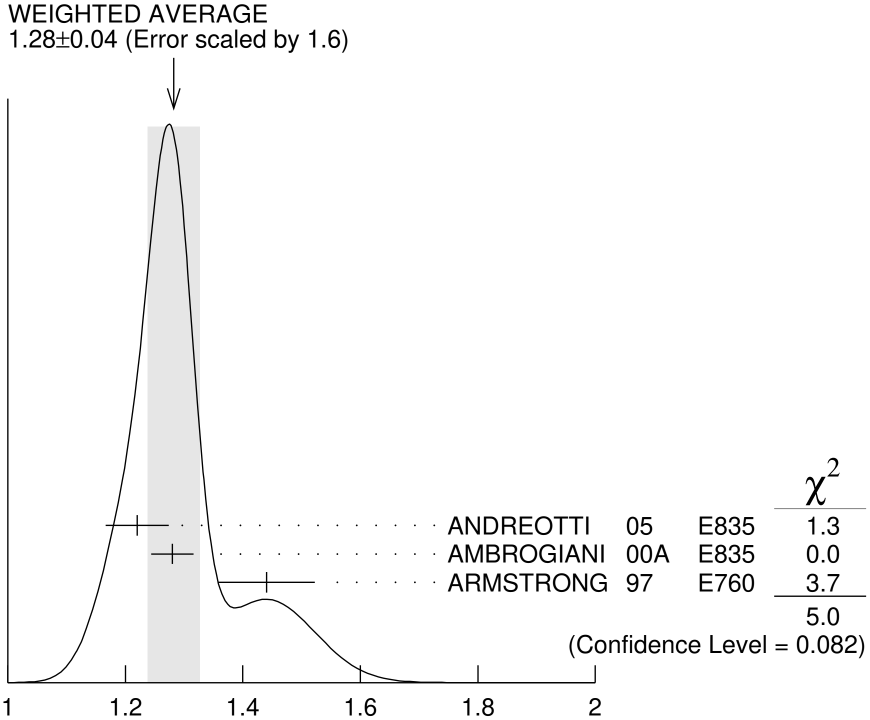
$\Gamma(J/\psi(1S)\text{anything})/\Gamma_{total}$ — Γ_7/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.569 ±0.009 OUR FIT					
0.592 ±0.018 OUR AVERAGE					
0.5950±0.0015±0.0190	151k	ADAM	05A	CLEO	$e^+e^- \to \psi(2S)$
0.51 ±0.12		BRANDELIK	79C	DASP	$e^+e^- \to \mu^+\mu^- X$
0.57 ±0.08		ABRAMS	75B	MRK1	$e^+e^- \to \mu^+\mu^- X$

$\Gamma(e^+e^-)/\Gamma(J/\psi(1S)\text{anything})$ — Γ_4/Γ_7

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
1.305±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	[19] ANDREOTTI	05	E835	$p\overline{p} \to \psi(2S) \to e^+e^-$
1.28 ±0.03 ±0.02		[19] AMBROGIANI	00A	E835	$p\overline{p} \to \psi(2S)$
1.44 ±0.08 ±0.02		[19] ARMSTRONG	97	E760	$\overline{p}p \to \psi(2S)$

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



$\Gamma\left(e^+e^-\right)/\Gamma\left(J/\psi(1S)\,\text{anything}\right)$ Γ_4/Γ_7

$\Gamma\left(\mu^+\mu^-\right)/\Gamma\left(J/\psi(1S)\,\text{anything}\right)$ Γ_5/Γ_7

VALUE	*DOCUMENT ID*		*TECN*	*COMMENT*
0.0130±0.0014 OUR FIT				
0.014 ±0.003	HILGER	75	SPEC	e^+e^-

$\Gamma\left(J/\psi(1S)\,\text{neutrals}\right)/\Gamma_{\text{total}}$ Γ_8/Γ

VALUE	*DOCUMENT ID*
0.233±0.004 OUR FIT	

$\Gamma\left(J/\psi(1S)\pi^+\pi^-\right)/\Gamma_{\text{total}}$ Γ_9/Γ

VALUE	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
0.323 ±0.005 OUR FIT					
0.323 ±0.013 OUR AVERAGE					
0.323 ±0.014		BAI	02B	BES2	e^+e^-
0.32 ±0.04		ABRAMS	75B	MRK1	$e^+e^- \rightarrow J/\psi\pi^+\pi^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.3354±0.0014±0.0110	60k	[20] ADAM	05A	CLEO	$e^+e^- \rightarrow \psi(2S)$

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

$\Gamma\left(e^+e^-\right)/\Gamma\left(J/\psi(1S)\pi^+\pi^-\right)$ Γ_4/Γ_9

VALUE	*DOCUMENT ID*		*TECN*	*COMMENT*
0.0230±0.0008 OUR FIT				
0.0252±0.0028±0.0011	[21] AUBERT	02B	BABR	e^+e^-

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

$\Gamma(\mu^+\mu^-)/\Gamma(J/\psi(1S)\pi^+\pi^-)$ — Γ_5/Γ_9

VALUE	DOCUMENT ID		TECN	COMMENT
0.0229±0.0026 OUR FIT				
0.0224±0.0029 OUR AVERAGE				
0.0216±0.0026±0.0014	[22] AUBERT	02B	BABR	e^+e^-
0.0327±0.0077±0.0072	[22] GRIBUSHIN	96	FMPS	515 π^- Be $\rightarrow$ $2\mu X$

[22] Using B($J/\psi(1S) \rightarrow \mu^+\mu^-$) = 0.0588 ± 0.0010.

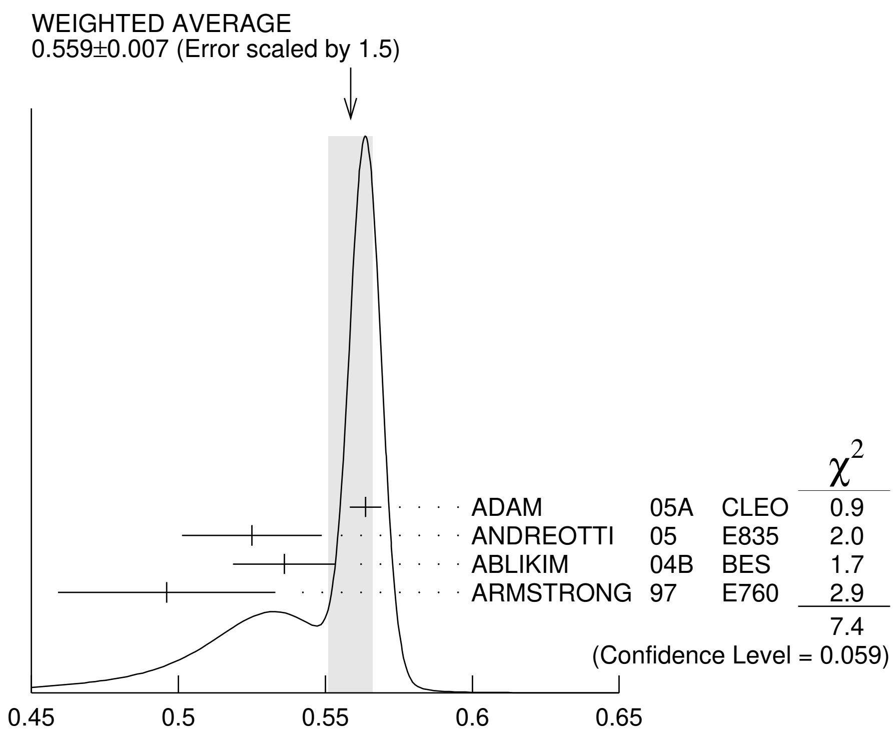
$\Gamma(\tau^+\tau^-)/\Gamma(J/\psi(1S)\pi^+\pi^-)$ — Γ_6/Γ_9

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
9.3 ±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_9/Γ_7

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.5679±0.0032 OUR FIT					
0.559 ±0.007 OUR AVERAGE Error includes scale factor of 1.5. See the ideogram below.					
0.5637±0.0027±0.0046	60k	ADAM	05A	CLEO	$e^+e^- \rightarrow \psi(2S)$
0.525 ±0.009 ±0.022	4090 ± 67	ANDREOTTI	05	E835	$\psi(2S) \rightarrow J/\psi X$
0.536 ±0.007 ±0.016	20k	[23,24] ABLIKIM	04B	BES	$\psi(2S) \rightarrow J/\psi X$
0.496 ±0.037		ARMSTRONG	97	E760	$\overline{p}p \rightarrow \psi(2S)$

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



$\Gamma(J/\psi(1S)\pi^+\pi^-)/\Gamma(J/\psi(1S)\text{anything})$ — Γ_9/Γ_7

$\Gamma\big(J/\psi(1S)\,\text{neutrals}\big)/\Gamma\big(J/\psi(1S)\pi^+\pi^-\big)$ — Γ_8/Γ_9

VALUE	DOCUMENT ID	TECN	COMMENT
0.721±0.008 OUR FIT			
0.73 ±0.09	TANENBAUM 76	MRK1	e^+e^-

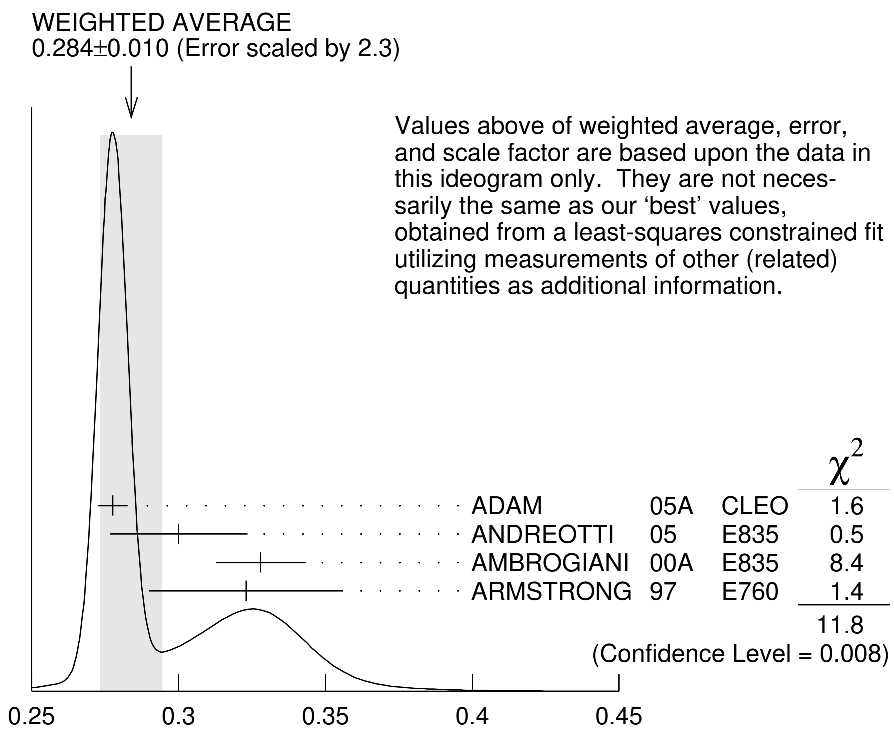
$\Gamma\big(J/\psi(1S)\pi^0\pi^0\big)/\Gamma_{\text{total}}$ — Γ_{10}/Γ

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
0.1668±0.0034 OUR FIT				
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.1652±0.0014±0.0058	13.4k	[25] ADAM 05A	CLEO	$e^+e^- \rightarrow \psi(2S)$

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

$\Gamma\big(J/\psi(1S)\pi^0\pi^0\big)/\Gamma\big(J/\psi(1S)\,\text{anything}\big)$ — Γ_{10}/Γ_7

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
0.2931±0.0032 OUR FIT				
0.284 ±0.010 OUR AVERAGE Error includes scale factor of 2.3. See the ideogram below.				
0.2776±0.0025±0.0043	13.4k	ADAM 05A	CLEO	$e^+e^- \rightarrow \psi(2S)$
0.300 ±0.008 ±0.022	1655 ± 44	ANDREOTTI 05	E835	$\psi(2S) \rightarrow J/\psi X$
0.328 ±0.013 ±0.008		AMBROGIANI 00A	E835	$p\overline{p} \rightarrow \psi(2S)$
0.323 ±0.033		ARMSTRONG 97	E760	$\overline{p}p \rightarrow \psi(2S)$



$\Gamma\big(J/\psi(1S)\pi^0\pi^0\big)/\Gamma\big(J/\psi(1S)\,\text{anything}\big)$ — Γ_{10}/Γ_7

$\Gamma(J/\psi(1S)\pi^0\pi^0)/\Gamma(J/\psi(1S)\pi^+\pi^-)$ Γ_{10}/Γ_9

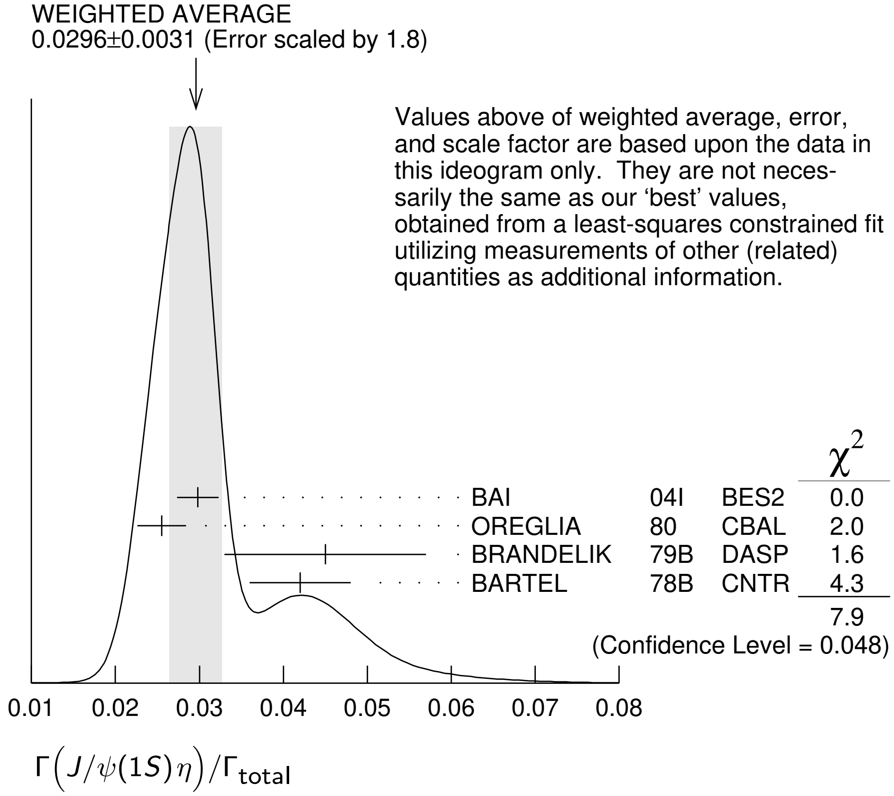
VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.516 ±0.017 OUR FIT					
0.570 ±0.009 ±0.026	14k	[26] ABLIKIM	04B	BES	$\psi(2S) \to J/\psi X$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.4924±0.0047±0.0086	73k	[27,28] ADAM	05A	CLEO	$e^+e^- \to \psi(2S)$
0.571 ±0.018 ±0.044		[29] ANDREOTTI	05	E835	$\psi(2S) \to J/\psi X$
0.53 ±0.06		TANENBAUM	76	MRK1	e^+e^-
0.64 ±0.15		[30] HILGER	75	SPEC	e^+e^-

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

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.0313±0.0008 OUR FIT					
0.0296±0.0031 OUR AVERAGE Error includes scale factor of 1.8. See the ideogram below.					
0.0298±0.0009±0.0023	5.7k	BAI	04I	BES2	$\psi(2S) \to J/\psi\gamma\gamma$
0.0255±0.0029	386	[31] OREGLIA	80	CBAL	$e^+e^- \to J/\psi 2\gamma$
0.045 ±0.012	17	[32] BRANDELIK	79B	DASP	$e^+e^- \to J/\psi 2\gamma$
0.042 ±0.006	164	[32] BARTEL	78B	CNTR	e^+e^-
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.0325±0.0006±0.0011	2.8k	[33] ADAM	05A	CLEO	$e^+e^- \to \psi(2S)$
0.043 ±0.008	44	TANENBAUM	76	MRK1	e^+e^-

[31] Recalculated by us using $B(J/\psi(1S) \to \ell^+\ell^-) = 0.1181 \pm 0.0020$.
[32] Recalculated by us using $B(J/\psi(1S) \to \mu^+\mu^-) = 0.0588 \pm 0.0010$.
[33] Not independent from other values reported by ADAM 05A.



$\Gamma\big(J/\psi(1S)\eta\big)/\Gamma\big(J/\psi(1S)\text{anything}\big)$ Γ_{11}/Γ_7

VALUE	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
0.0550±0.0011 OUR FIT					
0.0548±0.0012 OUR AVERAGE					
0.0546±0.0010±0.0007	2.8k	ADAM	05A	CLEO	$e^+ e^- \rightarrow \psi(2S)$
0.050 ±0.006 ±0.003	298 ± 20	ANDREOTTI	05	E835	$\psi(2S) \rightarrow J/\psi X$
0.072 ±0.009		AMBROGIANI	00A	E835	$p\overline{p} \rightarrow \psi(2S)$
0.061 ±0.015		ARMSTRONG	97	E760	$\overline{p}p \rightarrow \psi(2S)$

$\Gamma\big(J/\psi(1S)\eta\big)/\Gamma\big(J/\psi(1S)\pi^+\pi^-\big)$ Γ_{11}/Γ_9

VALUE	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
0.0969±0.0035 OUR FIT					
0.096 ±0.010 OUR AVERAGE					
0.098 ±0.005 ±0.010	2k	[34] ABLIKIM	04B	BES	$\psi(2S) \rightarrow J/\psi X$
0.091 ±0.021		[35] HIMEL	80	MRK2	$e^+ e^- \rightarrow \psi(2S) X$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.0968±0.0019±0.0013	2.8k	[36] ADAM	05A	CLEO	$e^+ e^- \rightarrow \psi(2S)$
0.095 ±0.007 ±0.007		[37] ANDREOTTI	05	E835	$\psi(2S) \rightarrow J/\psi X$

[34] From a fit to the J/ψ recoil mass spectra.

[35] The value for $B(\psi(2S) \rightarrow J/\psi(1s)\eta)$ reported in HIMEL 80 is derived using $B(\psi(2S)) \rightarrow J/\psi(1S)\pi^+\pi^-) = (33 \pm 3))\%$ and $B(J/\psi(1S) \rightarrow \ell^+\ell^-) = 0.138 \pm 0.018$. Calculated by us using $B(J/\psi(1S) \rightarrow \ell^+\ell^-) = (0.1181 \pm 0.0020)$.

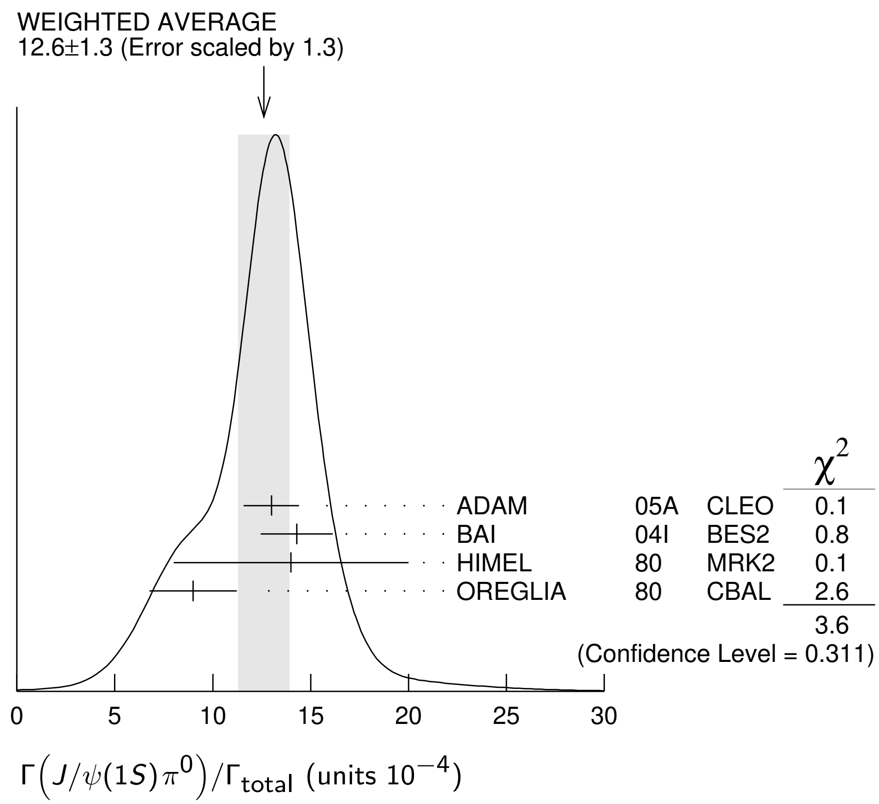
[36] Not independent from other values reported by ADAM 05A.

[37] Not independent from other values reported by ANDREOTTI 05.

$\Gamma(J/\psi(1S)\pi^0)/\Gamma_{total}$ — Γ_{12}/Γ

VALUE (units 10^{-4})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
12.6±1.3 OUR AVERAGE	Error includes scale factor of 1.3. See the ideogram below.				
13 ±1 ±1	88	ADAM	05A	CLEO	$e^+e^- \rightarrow \psi(2S)$
14.3±1.4±1.2	280	BAI	04I	BES2	$\psi(2S) \rightarrow J/\psi\gamma\gamma$
14 ±6	7	HIMEL	80	MRK2	e^+e^-
9 ±2 ±1	23	[38] OREGLIA	80	CBAL	$\psi(2S) \rightarrow J/\psi 2\gamma$

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



$\Gamma(J/\psi(1S)\pi^0)/\Gamma(J/\psi(1S)\text{anything})$ — Γ_{12}/Γ_7

VALUE (units 10^{-2})	*DOCUMENT ID*		*TECN*	*COMMENT*
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.22±0.02±0.01	[39] ADAM	05A	CLEO	$e^+e^- \rightarrow \psi(2S) \rightarrow J/\psi\gamma\gamma$

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

$\Gamma(J/\psi(1S)\pi^0)/\Gamma(J/\psi(1S)\pi^+\pi^-)$ — Γ_{12}/Γ_9

VALUE (units 10^{-2})	*DOCUMENT ID*		*TECN*	*COMMENT*
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.39±0.04±0.01	[40] ADAM	05A	CLEO	$e^+e^- \rightarrow \psi(2S) \rightarrow J/\psi\gamma\gamma$

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

HADRONIC DECAYS

$\Gamma(3(\pi^+\pi^-)\pi^0)/\Gamma_{total}$ — Γ_{13}/Γ

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

$\Gamma(2(\pi^+\pi^-)\pi^0)/\Gamma_{total}$ — Γ_{14}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
26.6±2.9 OUR AVERAGE					
26.1±0.7±3.0	1702.6	BRIERE	05	CLEO	$e^+e^- \rightarrow \psi(2S) \rightarrow 2(\pi^+\pi^-)\pi^0$
30 ±8	42	FRANKLIN	83	MRK2	e^+e^-

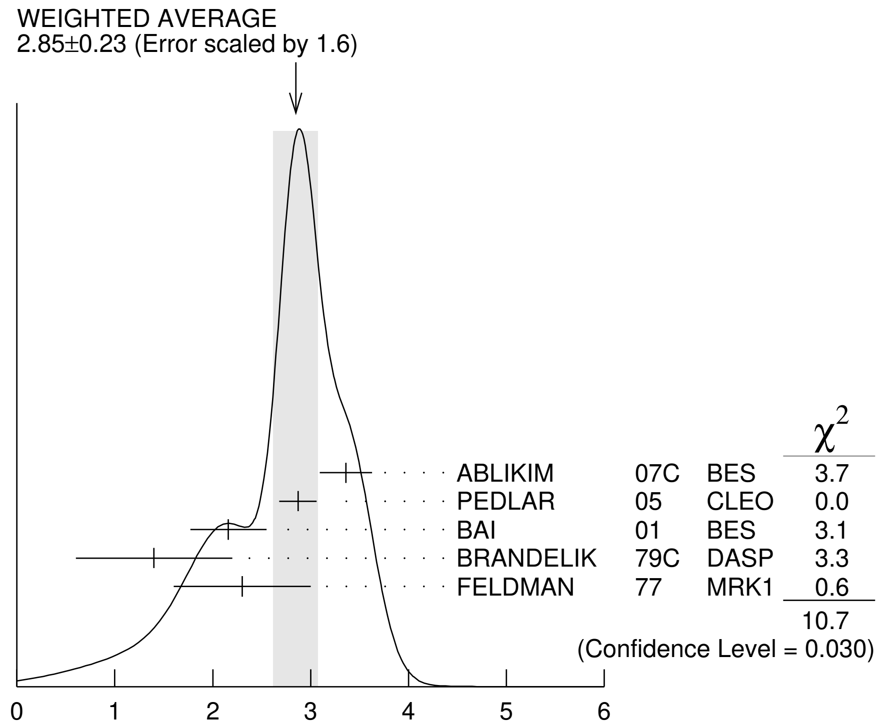
$\Gamma(\rho a_2(1320))/\Gamma_{total}$ — Γ_{15}/Γ

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

$\Gamma(p\overline{p})/\Gamma_{total}$ — Γ_{16}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
2.85±0.23 OUR AVERAGE	Error includes scale factor of 1.6. See the ideogram below.				
3.36±0.09±0.25	1618	ABLIKIM	07C	BES	$e^+e^- \rightarrow \psi(2S) \rightarrow p\overline{p}$
2.87±0.12±0.15	557	PEDLAR	05	CLEO	$e^+e^- \rightarrow \psi(2S) \rightarrow p\overline{p}$
2.16±0.15±0.36	201	[41] BAI	01	BES	$e^+e^- \rightarrow \psi(2S) \rightarrow p\overline{p}$
1.4 ±0.8	4	BRANDELIK	79C	DASP	$e^+e^- \rightarrow \psi(2S) \rightarrow p\overline{p}$
2.3 ±0.7		FELDMAN	77	MRK1	$e^+e^- \rightarrow \psi(2S) \rightarrow p\overline{p}$

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



$\Gamma\left(p\overline{p}\right)/\Gamma_{\text{total}}$ Γ_{16}/Γ

$\Gamma(\Delta^{++}\overline{\Delta}^{--})/\Gamma_{\text{total}}$ Γ_{17}/Γ

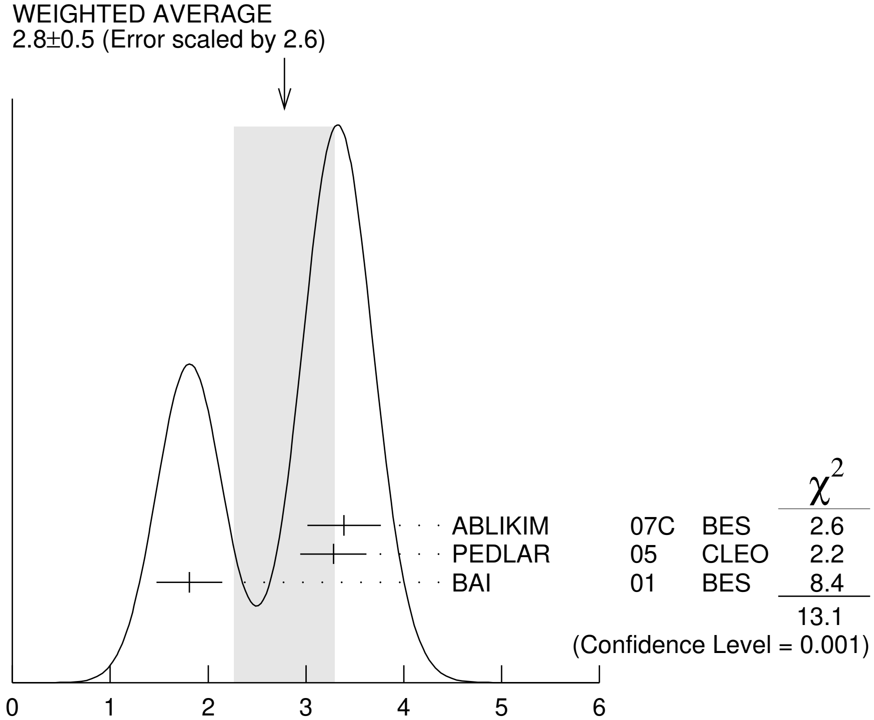
VALUE (units 10^{-5})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
12.8±1.0±3.4	157	[42] BAI	01	BES	$e^+e^- \rightarrow \psi(2S) \rightarrow$ hadrons

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

$\Gamma(\Lambda\overline{\Lambda})/\Gamma_{\text{total}}$ Γ_{18}/Γ

VALUE (units 10^{-4})	*CL%*	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
2.8 ±0.5 OUR AVERAGE			Error includes scale factor of 2.6. See the ideogram below.			
3.39±0.20±0.32		337	ABLIKIM	07C	BES	$e^+e^- \rightarrow \psi(2S) \rightarrow$ hadrons
3.28±0.23±0.25		208	PEDLAR	05	CLEO	$e^+e^- \rightarrow \psi(2S) \rightarrow$ hadrons
1.81±0.20±0.27		80	[43] BAI	01	BES	$e^+e^- \rightarrow \psi(2S) \rightarrow$ hadrons
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<4	90		FELDMAN	77	MRK1	$e^+e^- \rightarrow \psi(2S) \rightarrow$ hadrons

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



$\Gamma\left(\Lambda\overline{\Lambda}\right)/\Gamma_{\text{total}}$ Γ_{18}/Γ

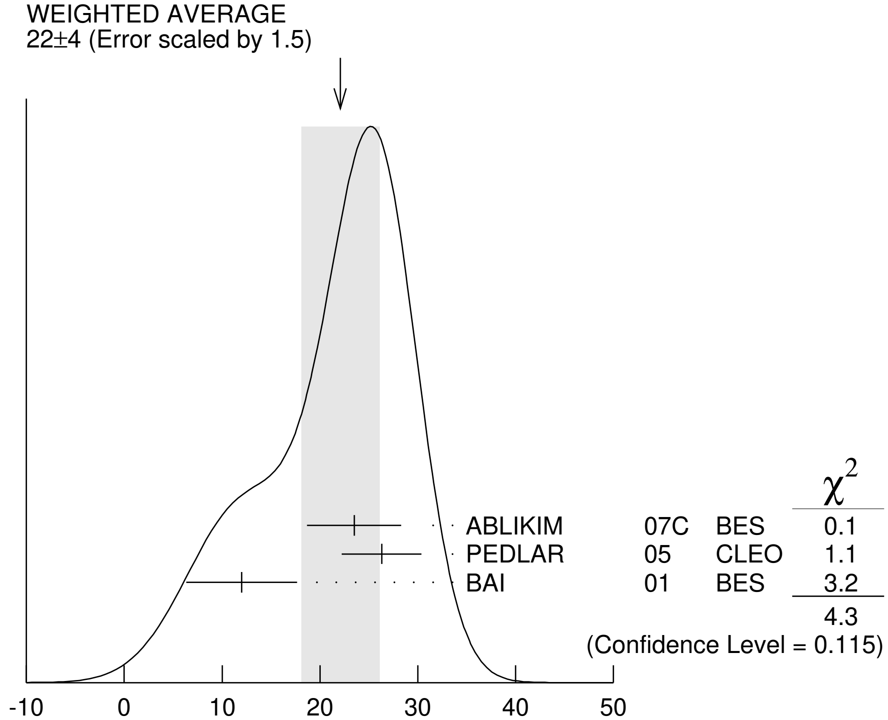
$\Gamma\left(\Sigma^+\overline{\Sigma}^-\right)/\Gamma_{\text{total}}$ Γ_{19}/Γ

VALUE (units 10^{-5})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
25.7±4.4±6.8	35	PEDLAR	05	CLEO	$e^+e^- \rightarrow \psi(2S) \rightarrow$ hadrons

$\Gamma\left(\Sigma^0\overline{\Sigma}^0\right)/\Gamma_{\text{total}}$ Γ_{20}/Γ

VALUE (units 10^{-5})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
22 ±4 OUR AVERAGE		Error includes scale factor of 1.5. See the ideogram below.			
23.5±3.6±3.2	59	ABLIKIM	07C	BES	$e^+e^- \rightarrow \psi(2S) \rightarrow$ hadrons
26.3±3.5±2.1	58	PEDLAR	05	CLEO	$e^+e^- \rightarrow \psi(2S) \rightarrow$ hadrons
12 ±4 ±4	8	[44] BAI	01	BES	$e^+e^- \rightarrow \psi(2S) \rightarrow$ hadrons

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



$\Gamma\left(\Sigma^0\overline{\Sigma}^0\right)/\Gamma_{\text{total}}$ Γ_{20}/Γ

$\Gamma\left(\Sigma(1385)^+\overline{\Sigma}(1385)^-\right)/\Gamma_{\text{total}}$ Γ_{21}/Γ

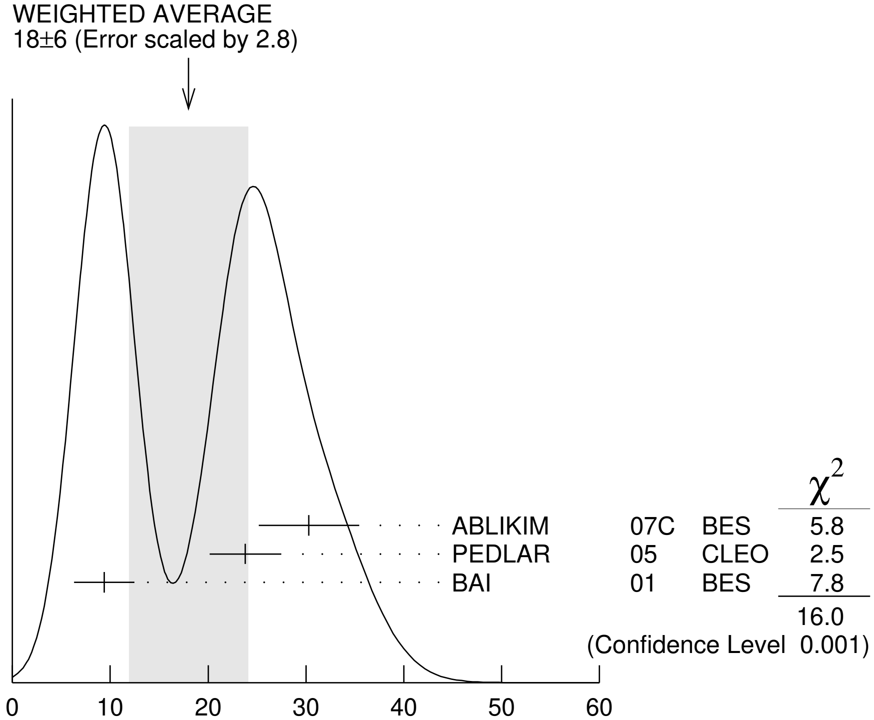
VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
11±3±3	14	[45] BAI	01	BES	$e^+e^- \to \psi(2S) \to$ hadrons

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

$\Gamma\left(\Xi^-\overline{\Xi}^+\right)/\Gamma_{\text{total}}$ Γ_{22}/Γ

VALUE (units 10^{-5})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
18 ±6 OUR AVERAGE			Error includes scale factor of 2.8. See the ideogram below.			
30.3±4.0±3.2		67	ABLIKIM	07C	BES	$e^+e^- \to \psi(2S) \to$ hadrons
23.8±3.0±2.1		63	PEDLAR	05	CLEO	$e^+e^- \to \psi(2S) \to$ hadrons
9.4±2.7±1.5		12	[46] BAI	01	BES	$e^+e^- \to \psi(2S) \to$ hadrons
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<20	90		FELDMAN	77	MRK1	$e^+e^- \to \psi(2S) \to$ hadrons

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



$\Gamma\left(\Xi^- \overline{\Xi}^+\right)/\Gamma_{\text{total}}$ Γ_{22}/Γ

$\Gamma\left(\Xi^0 \overline{\Xi}^0\right)/\Gamma_{\text{total}}$ Γ_{23}/Γ

VALUE (units 10^{-5})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
27.5±6.4±6.1	19	PEDLAR	05	CLEO	$e^+e^- \rightarrow \psi(2S) \rightarrow$ hadrons

$\Gamma\left(\Xi(1530)^0 \overline{\Xi}(1530)^0\right)/\Gamma_{\text{total}}$ Γ_{24}/Γ

VALUE (units 10^{-5})	*CL%*	*DOCUMENT ID*		*TECN*	*COMMENT*
< 8.1	90	[47] BAI	01	BES	$e^+e^- \rightarrow \psi(2S) \rightarrow$ 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

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

$\Gamma\left(\Omega^- \overline{\Omega}^+\right)/\Gamma_{\text{total}}$ Γ_{25}/Γ

VALUE (units 10^{-5})	*CL%*	*DOCUMENT ID*		*TECN*	*COMMENT*
< 7.3	90	[48] BAI	01	BES	$e^+e^- \rightarrow \psi(2S) \rightarrow$ hadrons
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<16	90	PEDLAR	05	CLEO	$e^+e^- \rightarrow \psi(2S) \rightarrow$ hadrons

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

$\Gamma\left(\pi^0 p \overline{p}\right)/\Gamma_{\text{total}}$ Γ_{26}/Γ

VALUE (units 10^{-4})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
1.33±0.17 OUR AVERAGE					
1.32±0.10±0.15	256 ± 18	[49] ABLIKIM	05E	BES2	$e^+e^- \rightarrow \psi(2S) \rightarrow p\overline{p}\gamma\gamma$
1.4 ±0.5	9	FRANKLIN	83	MRK2	e^+e^-

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

$\Gamma(\eta p\overline{p})/\Gamma_{total}$ — Γ_{27}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
0.60±0.12 OUR AVERAGE					
0.58±0.11±0.07	44.8 ± 8.5	[50] ABLIKIM	05E	BES2	$e^+e^- \to \psi(2S) \to p\overline{p}\gamma\gamma$
0.8 ±0.3 ±0.3	9.8	BRIERE	05	CLEO	$e^+e^- \to \psi(2S) \to p\overline{p}\pi^+\pi^-\pi^0$

[50] Computed using B($\eta \to \gamma\gamma$) = (39.43 ± 0.26)%.

$\Gamma(\omega p\overline{p})/\Gamma_{total}$ — Γ_{28}/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	[51] BAI	03B	BES	$\psi(2S) \to p\overline{p}\pi^+\pi^-\pi^0$

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

$\Gamma(\phi p\overline{p})/\Gamma_{total}$ — Γ_{29}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<0.24	90	BRIERE	05	CLEO	$e^+e^- \to \psi(2S) \to p\overline{p}K^+K^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.26	90	[52] BAI	03B	BES	$\psi(2S) \to K^+K^-p\overline{p}$

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

$\Gamma(\pi^+\pi^- p\overline{p})/\Gamma_{total}$ — Γ_{30}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
6.0±0.4 OUR AVERAGE					
5.9±0.2±0.4	904.5	BRIERE	05	CLEO	$e^+e^- \to \psi(2S) \to p\overline{p}\pi^+\pi^-$
8 ±2		[53] TANENBAUM	78	MRK1	e^+e^-

[53] Assuming entirely strong decay.

$\Gamma(p\overline{n}\pi^-$ or c.c.$)/\Gamma_{total}$ — Γ_{31}/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_{32}/Γ

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

$\Gamma(\eta\pi^+\pi^-)/\Gamma_{total}$ — Γ_{34}/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_{35}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
9.5±0.7±1.5		[54] 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	[55] BRIERE	05	CLEO	$e^+e^- \to \psi(2S) \to \eta 3\pi(\eta \to \gamma\gamma)$
8.1±1.4±1.6	50.0	[55] BRIERE	05	CLEO	$e^+e^- \to \psi(2S) \to \eta 3\pi(\eta \to 3\pi)$

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

$\Gamma(\eta'\pi^+\pi^-\pi^0)/\Gamma_{total}$ — Γ_{36}/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

$\Gamma(\omega\pi^+\pi^-)/\Gamma_{total}$ — Γ_{37}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
6.6±1.7 OUR AVERAGE Error includes scale factor of 2.7.					
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	[56] BAI	03B	BES	$\psi(2S) \to 2(\pi^+\pi^-)\pi^0$

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

$\Gamma(b_1^\pm\pi^\mp)/\Gamma_{total}$ — Γ_{38}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
3.6 ±0.6 OUR AVERAGE					
$4.18^{+0.43}_{-0.42}\pm0.92$	170	ADAM	05	CLEO	$e^+e^- \to \psi(2S)$
3.2 ±0.6 ±0.5	61 ± 11	[57,58] 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		[57] BAI	99C	BES	Repl. by BAI 03B

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

$\Gamma(b_1^0\pi^0)/\Gamma_{total}$ — Γ_{39}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
$2.35^{+0.47}_{-0.42}\pm0.40$	45	ADAM	05	CLEO	$e^+e^- \to \psi(2S)$

$\Gamma(\omega f_2(1270))/\Gamma_{total}$ — Γ_{40}/Γ

VALUE (units 10^{-4})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
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		[59] BAI	03B	BES	$\psi(2S) \to 2(\pi^+\pi^-)\pi^0$
<1.7	90		BAI	98J	BES	Repl. by BAI 03B

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

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

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
7.2±0.5 OUR AVERAGE					
7.1±0.3±0.4	817.2	BRIERE	05	CLEO	$e^+e^- \to \psi(2S) \to K^+K^-\pi^+\pi^-$
16 ±4		[60] TANENBAUM	78	MRK1	e^+e^-

[60] Assuming entirely strong decay.

$\Gamma(\rho^0 K^+K^-)/\Gamma_{total}$ — Γ_{42}/Γ

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

$\Gamma(K^*(892)^0\overline{K}^*_2(1430)^0)/\Gamma_{total}$ — Γ_{43}/Γ

VALUE (units 10^{-4})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
1.86±0.32±0.43		93 ± 16	BAI	04C		$\psi(2S) \to K^+K^-\pi^+\pi^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<1.2	90		BAI	98J	BES	e^+e^-

$\Gamma(K_1(1270)^\pm K^\mp)/\Gamma_{total}$ — Γ_{45}/Γ

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
10.0±1.8±2.1	[61] BAI	99C	BES	e^+e^-

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

$\Gamma(K^0_S K^0_S \pi^+\pi^-)/\Gamma_{total}$ — Γ_{46}/Γ

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

$\Gamma(\rho^0 p\overline{p})/\Gamma_{total}$ — Γ_{47}/Γ

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

$\Gamma(K^+\overline{K}^*(892)^0\pi^- + \text{c.c.})/\Gamma_{total}$ — Γ_{48}/Γ

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

$\Gamma(2(\pi^+\pi^-))/\Gamma_{total}$ — Γ_{49}/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_{50}/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	$e^+e^- \rightarrow \psi(2S) \rightarrow 2(\pi^+\pi^-)$
4.2±1.5		TANENBAUM	78	MRK1	e^+e^-

$\Gamma(K^+K^-\pi^+\pi^-\pi^0)/\Gamma_{total}$ — Γ_{51}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
$12.4^{+1.0}_{-0.9}$ OUR AVERAGE					
11.7±1.0±1.5	597	ABLIKIM	06G	BES2	$\psi(2S) \rightarrow K^+K^-\pi^+\pi^-\pi^0$
12.7±0.5±1.0	711.6	BRIERE	05	CLEO	$e^+e^- \rightarrow \psi(2S) \rightarrow K^+K^-\pi^+\pi^-\pi^0$

$\Gamma(\omega f_0(1710) \rightarrow \omega K^+K^-)/\Gamma_{total}$ — Γ_{52}/Γ

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

$\Gamma(K^*(892)^0K^-\pi^+\pi^0 + \text{c.c.})/\Gamma_{total}$ — Γ_{53}/Γ

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

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

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

$\Gamma(K^*(892)^+K^-\rho^0 + \text{c.c.})/\Gamma_{total}$ — Γ_{55}/Γ

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

$\Gamma(K^*(892)^0K^-\rho^+ + \text{c.c.})/\Gamma_{total}$ — Γ_{56}/Γ

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

$\Gamma(\eta K^+K^-)/\Gamma_{total}$ — Γ_{57}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<1.3	90	BRIERE	05	CLEO	$e^+e^- \rightarrow \psi(2S) \rightarrow K^+K^-\pi^+\pi^-\pi^0$

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

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
1.85±0.25 OUR AVERAGE Error includes scale factor of 1.1.					
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	23.0 ± 5.2	[62] BAI	03B	BES	$\psi(2S) \to K^+ K^- \pi^+ \pi^- \pi^0$

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

$\Gamma(3(\pi^+ \pi^-))/\Gamma_{total}$ — Γ_{59}/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		[63] TANENBAUM	78	MRK1	$e^+ e^-$

[63] Assuming entirely strong decay.

$\Gamma(p\overline{p}\pi^+ \pi^- \pi^0)/\Gamma_{total}$ — Γ_{60}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
7.3±0.4±0.6	434.9	BRIERE	05	CLEO	$e^+ e^- \to \psi(2S) \to p\overline{p}\pi^+ \pi^- \pi^0$

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

VALUE (units 10^{-5})	CL%	DOCUMENT ID		TECN	COMMENT
6.3±0.7 OUR AVERAGE					
6.3±0.6±0.3		DOBBS	06A	CLEO	$e^+ e^-$
10 ±7		BRANDELIK	79C	DASP	$e^+ e^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
< 5	90	FELDMAN	77	MRK1	$e^+ e^-$

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

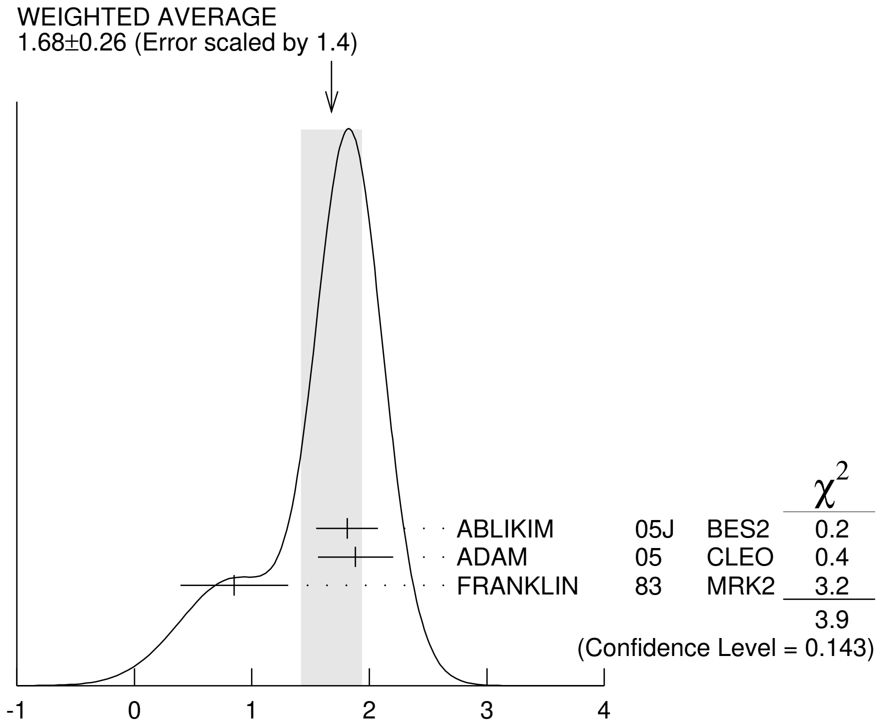
VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
5.4 ±0.5 OUR AVERAGE					
5.8 ±0.8 ±0.4		DOBBS	06A	CLEO	$e^+ e^-$
5.24±0.47±0.48	156 ± 14	[64] BAI	04B	BES2	$\psi(2S) \to K^0_S K^0_L \to \pi^+ \pi^- X$

[64] Using B($K^0_S \to \pi^+ \pi^-$) = 0.6860 ± 0.0027.

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

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
1.68±0.26 OUR AVERAGE Error includes scale factor of 1.4. See the ideogram below.					
1.81±0.18±0.19	260 ± 19	[65] ABLIKIM	05J	BES2	$e^+ e^- \to \psi(2S)$
$1.88^{+0.16}_{-0.15}$±0.28	194	ADAM	05	CLEO	$e^+ e^- \to \psi(2S)$
0.85±0.46	4	FRANKLIN	83	MRK2	$e^+ e^- \to$ hadrons

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



$\Gamma\left(\pi^+ \pi^- \pi^0\right)/\Gamma_{\text{total}}$ Γ_{63}/Γ

$\Gamma\left(\rho(2150)\pi \rightarrow \pi^+ \pi^- \pi^0\right)/\Gamma_{\text{total}}$ Γ_{64}/Γ

VALUE (units 10^{-4})	*DOCUMENT ID*		*TECN*	*COMMENT*
$\mathbf{1.94 \pm 0.25^{+1.15}_{-0.34}}$	[66] ABLIKIM	05J	BES2	$\psi(2S) \rightarrow \rho(2150)\pi \rightarrow \pi^+ \pi^- \pi^0$

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

$\Gamma\left(\rho(770)\pi \rightarrow \pi^+ \pi^- \pi^0\right)/\Gamma_{\text{total}}$ Γ_{65}/Γ

VALUE (units 10^{-4})	*CL%*	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
0.32±0.12 OUR AVERAGE	Error includes scale factor of 1.8.					
$0.51 \pm 0.07 \pm 0.11$			[67] ABLIKIM	05J	BES2	$\psi(2S) \rightarrow \rho(770)\pi \rightarrow \pi^+ \pi^- \pi^0$
$0.24^{+0.08}_{-0.07} \pm 0.02$		22	ADAM	05	CLEO	$e^+ e^- \rightarrow \psi(2S)$
• • • 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		[68] ABRAMS	75	MRK1	$e^+ e^-$

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

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

VALUE (units 10^{-5})	CL%	DOCUMENT ID		TECN	COMMENT
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^-

$\Gamma(K_1(1400)^\pm K^\mp)/\Gamma_{total}$ — Γ_{67}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<3.1	90	[69] BAI	99C	BES	e^+e^-

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

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

VALUE (units 10^{-5})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
<2.96	90	1	FRANKLIN	83	MRK2	$e^+e^- \to$ hadrons

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

VALUE (units 10^{-5})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
$1.7^{+0.8}_{-0.7}$ OUR AVERAGE						
$2.9^{+1.3}_{-1.7}\pm0.4$		9.6 ± 4.2	ABLIKIM	05I	BES2	$e^+e^- \to \psi(2S)$
$1.3^{+1.0}_{-0.7}\pm0.3$		7	ADAM	05	CLEO	$e^+e^- \to \psi(2S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<5.4	90		FRANKLIN	83	MRK2	$e^+e^- \to$ hadrons

$\Gamma(K^*(892)^0\overline{K}^0 + \text{c.c.})/\Gamma_{total}$ — Γ_{70}/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	$e^+e^- \to \psi(2S)$

$\Gamma(K^+\overline{K}^*(892)^- + \text{c.c.})/\Gamma(K^*(892)^0\overline{K}^0 + \text{c.c.})$ — Γ_{69}/Γ_{70}

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	$e^+e^- \to \psi(2S)$

$\Gamma(\phi\pi^+\pi^-)/\Gamma_{total}$ — Γ_{71}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
1.13±0.29 OUR AVERAGE Error includes scale factor of 1.7.					
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	[70] BAI	03B	BES	$\psi(2S) \to K^+K^-\pi^+\pi^-$

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

$\Gamma(\phi f_0(980) \to \pi^+\pi^-)/\Gamma_{total}$ — Γ_{72}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
0.6±0.2 ±0.1	18.4 ± 6.4	[71] BAI	03B	BES	$\psi(2S) \to K^+K^-\pi^+\pi^-$

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

$\Gamma(2(K^+K^-))/\Gamma_{total}$ — Γ_{73}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
0.6±0.1 ±0.1	59.2	BRIERE	05	CLEO	$e^+e^- \to \psi(2S) \to 2(K^+K^-)$

$\Gamma(\phi K^+K^-)/\Gamma_{total}$ — Γ_{74}/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	[72] BAI	03B	BES	$\psi(2S) \to 2(K^+K^-)$

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

$\Gamma(2(K^+K^-)\pi^0)/\Gamma_{total}$ — Γ_{75}/Γ

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

$\Gamma(\phi\eta)/\Gamma_{total}$ — Γ_{76}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
$\mathbf{2.8^{+1.0}_{-0.8}}$ **OUR AVERAGE**					
$2.0^{+1.5}_{-1.1}\pm0.4$	6	ADAM	05	CLEO	$e^+e^- \to \psi(2S)$
3.3±1.1±0.5	17	ABLIKIM	04K	BES	$e^+e^- \to \psi(2S)$

$\Gamma(\phi\eta')/\Gamma_{total}$ — Γ_{77}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
3.1±1.4±0.7	8	[73] ABLIKIM	04K	BES	$e^+e^- \to \psi(2S)$

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

$\Gamma(\omega\eta')/\Gamma_{total}$ — Γ_{78}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
$\mathbf{3.2^{+2.4}_{-2.0}\pm0.7}$	4	[74] ABLIKIM	04K	BES	$e^+e^- \to \psi(2S)$

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

$\Gamma(\omega\pi^0)/\Gamma_{total}$ — Γ_{79}/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	$e^+e^- \to \psi(2S)$

$\Gamma(\rho\eta')/\Gamma_{total}$ — Γ_{80}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
$1.87^{+1.64}_{-1.11}\pm0.33$	2	ABLIKIM	04L	BES	$e^+e^- \to \psi(2S)$

$\Gamma(\rho\eta)/\Gamma_{total}$ — Γ_{81}/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	$e^+e^- \to \psi(2S)$

$\Gamma(\omega\eta)/\Gamma_{total}$ — Γ_{82}/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	$e^+e^- \to \psi(2S)$

$\Gamma(\phi\pi^0)/\Gamma_{total}$ — Γ_{83}/Γ

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

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

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

$\Gamma(p\overline{p}K^+K^-)/\Gamma_{total}$ — Γ_{85}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
2.7±0.6±0.4	30.1	BRIERE	05	CLEO	$e^+e^- \to \psi(2S) \to p\overline{p}K^+K^-$

$\Gamma(\Lambda\overline{\Lambda}\pi^+\pi^-)/\Gamma_{total}$ — Γ_{86}/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_{87}/Γ

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

$\Gamma(\Lambda\overline{p}K^+\pi^+\pi^-)/\Gamma_{total}$ — Γ_{88}/Γ

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

$\Gamma(\phi f_2'(1525))/\Gamma_{total}$ Γ_{89}/Γ

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

$\Gamma(\Theta(1540)\overline{\Theta}(1540) \rightarrow K_S^0 p K^- \overline{n} + \text{c.c.})/\Gamma_{total}$ Γ_{90}/Γ

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

$\Gamma(\Theta(1540)K^-\overline{n} \rightarrow K_S^0 p K^- \overline{n})/\Gamma_{total}$ Γ_{91}/Γ

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

$\Gamma(\Theta(1540)K_S^0\overline{p} \rightarrow K_S^0 \overline{p} K^+ n)/\Gamma_{total}$ Γ_{92}/Γ

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

$\Gamma(\overline{\Theta}(1540)K^+ n \rightarrow K_S^0 \overline{p} K^+ n)/\Gamma_{total}$ Γ_{93}/Γ

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

$\Gamma(\overline{\Theta}(1540)K_S^0 p \rightarrow K_S^0 p K^- \overline{n})/\Gamma_{total}$ Γ_{94}/Γ

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

$\Gamma(K_S^0 K_S^0)/\Gamma_{total}$ Γ_{95}/Γ

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
<0.046	[75] BAI	04D	BES	e^+e^-

[75] Forbidden by CP.

——— RADIATIVE DECAYS ———

$\Gamma(\gamma\chi_{c0}(1P))/\Gamma_{total}$ Γ_{96}/Γ

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
9.3 ±0.4 OUR FIT					
9.2 ±0.4 OUR AVERAGE					
9.22±0.11±0.46	72600	ATHAR	04	CLEO	$e^+e^- \rightarrow \gamma X$
9.9 ±0.5 ±0.8		[76] GAISER	86	CBAL	$e^+e^- \rightarrow \gamma X$
7.2 ±2.3		[76] BIDDICK	77	CNTR	$e^+e^- \rightarrow \gamma X$
7.5 ±2.6		[76] WHITAKER	76	MRK1	e^+e^-

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

$\Gamma(\gamma\chi_{c1}(1P))/\Gamma_{total}$ $\qquad$ Γ_{97}/Γ

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
8.8 ±0.4 OUR FIT					
8.9 ±0.5 OUR AVERAGE					
9.07±0.11±0.54	76700	ATHAR	04	CLEO	$e^+e^- \rightarrow \gamma X$
9.0 ±0.5 ±0.7		[77] GAISER	86	CBAL	$e^+e^- \rightarrow \gamma X$
7.1 ±1.9		[78] BIDDICK	77	CNTR	$e^+e^- \rightarrow \gamma X$

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

$\Gamma(\gamma\chi_{c2}(1P))/\Gamma_{total}$ $\qquad$ Γ_{98}/Γ

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
8.1 ±0.4 OUR FIT					
8.8 ±0.5 OUR AVERAGE Error includes scale factor of 1.1.					
9.33±0.14±0.61	79300	ATHAR	04	CLEO	$e^+e^- \rightarrow \gamma X$
8.0 ±0.5 ±0.7		[79] GAISER	86	CBAL	$e^+e^- \rightarrow \gamma X$
7.0 ±2.0		[80] BIDDICK	77	CNTR	$e^+e^- \rightarrow \gamma X$

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

$\left[\Gamma(\gamma\chi_{c0}(1P))+\Gamma(\gamma\chi_{c1}(1P))+\Gamma(\gamma\chi_{c2}(1P))\right]/\Gamma_{total}$ $\qquad$ $(\Gamma_{96}+\Gamma_{97}+\Gamma_{98})/\Gamma$

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
27.6±0.3±2.0	[81] ATHAR	04	CLEO	$e^+e^- \rightarrow \gamma X$

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

$\Gamma(\gamma\chi_{c0}(1P))/\Gamma(\gamma\chi_{c1}(1P))$ $\qquad$ Γ_{96}/Γ_{97}

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1.02±0.01±0.07	[82] ATHAR	04	CLEO	$e^+e^- \rightarrow \gamma X$

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

$\Gamma(\gamma\chi_{c2}(1P))/\Gamma(\gamma\chi_{c1}(1P))$ $\qquad$ Γ_{98}/Γ_{97}

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1.03±0.02±0.03	[83] ATHAR	04	CLEO	$e^+e^- \rightarrow \gamma X$

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

$\Gamma(\gamma\chi_{c0}(1P))/\Gamma(\gamma\chi_{c2}(1P))$ $\qquad$ Γ_{96}/Γ_{98}

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.99±0.02±0.08	[84] ATHAR	04	CLEO	$e^+e^- \rightarrow \gamma X$

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

$\Gamma(\gamma\eta_c(1S))/\Gamma_{total}$ — Γ_{99}/Γ

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
0.30±0.05 OUR AVERAGE					
0.32±0.04±0.06	2560	[85] ATHAR	04	CLEO	$e^+e^- \to \gamma X$
0.28±0.06		[86] GAISER	86	CBAL	$e^+e^- \to \gamma X$

[85] ATHAR 04 used $\Gamma_{\eta_c(1S)} = 24.8 \pm 4.9$ MeV to obtain this result.
[86] GAISER 86 used $\Gamma_{\eta_c(1S)} = 11.5 \pm 4.5$ MeV to obtain this result.

$\Gamma(\gamma\eta_c(2S))/\Gamma_{total}$ — Γ_{100}/Γ

VALUE (units 10^{-2})	CL%	DOCUMENT ID		TECN	COMMENT
<0.20	90	ATHAR	04	CLEO	$e^+e^- \to \gamma X$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.2 to 1.3	95	EDWARDS	82C	CBAL	$e^+e^- \to \gamma X$

$\Gamma(\gamma\pi^0)/\Gamma_{total}$ — Γ_{101}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
< 54	95	[87] LIBERMAN	75	SPEC	e^+e^-
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<100	90	WIIK	75	DASP	e^+e^-

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

$\Gamma(\gamma\eta'(958))/\Gamma_{total}$ — Γ_{102}/Γ

VALUE (units 10^{-4})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
1.36±0.24 OUR AVERAGE						
1.24±0.27±0.15		23	ABLIKIM	06R	BES2	$e^+e^- \to \psi(2S)$
1.54±0.31±0.20		~ 43	BAI	98F	BES	$\psi(2S) \to \pi^+\pi^- 2\gamma$, $\pi^+\pi^- 3\gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
< 60	90		[88] BRAUNSCH...	77	DASP	e^+e^-
< 11	90		[89] BARTEL	76	CNTR	e^+e^-

[88] Restated by us using total decay width 228 keV.
[89] The value is normalized to the branching ratio for $\Gamma(J/\psi(1S)\eta)/\Gamma_{total}$.

$\Gamma(\gamma f_2(1270))/\Gamma_{total}$ — Γ_{103}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
2.12±0.19±0.32		[90,91] BAI	03C	BES	$\psi(2S) \to \gamma\pi\pi$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
2.08±0.19±0.33	200.6 ± 18.8	[90] BAI	03C	BES	$\psi(2S) \to \gamma\pi^+\pi^-$
2.90±1.08±1.07	29.9 ± 11.1	[90] BAI	03C	BES	$\psi(2S) \to \gamma\pi^0\pi^0$

[90] Normalized to B($\psi(2S) \to J/\psi\pi^+\pi^-$) = 0.305 ± 0.016.
[91] Combining the results from $\pi^+\pi^-$ and $\pi^0\pi^0$ decay modes.

$\Gamma(\gamma f_0(1710) \to \gamma\pi\pi)/\Gamma_{total}$ — Γ_{105}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
0.301±0.041±0.124	35.6 ± 4.8	[92] BAI	03C	BES	$\psi(2S) \to \gamma\pi^+\pi^-$

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

$\Gamma(\gamma f_0(1710) \to \gamma K\overline{K})/\Gamma_{\text{total}}$ Γ_{106}/Γ

VALUE (units 10^{-4})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
0.604±0.090±0.132		39.6 ± 5.9	[93,94] BAI	03C	BES	$\psi(2S) \to \gamma K^+ K^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<1.56	90	6.8 ± 3.1	[93,94] BAI	03C	BES	$\psi(2S) \to \gamma K^0_S K^0_S$

[93] 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.

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

$\Gamma(\gamma\eta)/\Gamma_{\text{total}}$ Γ_{108}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<0.9	90	BAI	98F	BES	$\psi(2S) \to \pi^+\pi^- 3\gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<2	90	YAMADA	77	DASP	$e^+e^- \to 3\gamma$

$\Gamma(\gamma\eta\pi^+\pi^-)/\Gamma_{\text{total}}$ Γ_{109}/Γ

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

$\Gamma(\gamma\eta(1405) \to \gamma K\overline{K}\pi)/\Gamma_{\text{total}}$ Γ_{111}/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. • • •					
<1.3	90	ABLIKIM	06R	BES2	$\psi(2S) \to \gamma K^+K^-\pi^0$
<1.2	90	[95] SCHARRE	80	MRK1	e^+e^-

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

$\Gamma(\gamma\eta(1405) \to \eta\pi^+\pi^-)/\Gamma_{\text{total}}$ Γ_{112}/Γ

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

$\Gamma(\gamma\eta(1475) \to K\overline{K}\pi)/\Gamma_{\text{total}}$ Γ_{114}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<1.4	90	ABLIKIM	06R	BES2	$\psi(2S) \to \gamma K^+K^-\pi^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<1.5	90	ABLIKIM	06R	BES2	$\psi(2S) \to \gamma K^0_S K^+\pi^- +$ c.c.

$\Gamma(\gamma\eta(1475) \to \eta\pi^+\pi^-)/\Gamma_{\text{total}}$ Γ_{115}/Γ

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

$\psi(2S)$ 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.

$\psi(2S)$ REFERENCES

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ANASHIN	07	JETPL 85 347	V.V. Anashin *et al.*	(KEDR Collab.)
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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.)
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ADAM	06	PRL 96 082004	N.E. Adam *et al.*	(CLEO Collab.)
AUBERT	06B	PR D73 012005	B. Aubert *et al.*	(BABAR Collab.)
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PDG	04	PL B592 1	S. Eidelman *et al.*	
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.)
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AUBERT	02B	PR D65 031101R	B. Aubert *et al.*	(BaBar Collab.)
BAI	02	PR D65 052004	J.Z. Bai *et al.*	(BES Collab.)
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BAI	00	PRL 84 594	J.Z. Bai *et al.*	(BES Collab.)
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ARMSTRONG	97	PR D55 1153	T.A. Armstrong *et al.*	(E760 Collab.)
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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)
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		Translated from YAF 34 1471.		
BRANDELIK	79B	NP B160 426	R. Brandelik *et al.*	(DASP Collab.)
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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.)
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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)
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BARATE	83	PL 121B 449	R. Barate *et al.*	(SACL, LOIC, SHMP, IND)
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