$$\boxed{J/\psi(1S)} \qquad I^G(J^{PC}) = 0^-(1^{--})$$

$J/\psi(1S)$ MASS

VALUE (MeV)	EVTS		DOCUMENT ID		TECN	COMMENT
3096.916±0.011 OUR AVERAGE						
3096.917±0.010±0.007			AULCHENKO	03	KEDR	$e^+e^- \to$ hadrons
3096.89 ±0.09	502	[1]	ARTAMONOV	00	OLYA	$e^+e^- \to$ hadrons
3096.91 ±0.03 ±0.01		[2]	ARMSTRONG	93B	E760	$\overline{p}p \to e^+e^-$
3096.95 ±0.1 ±0.3	193		BAGLIN	87	SPEC	$\overline{p}p \to e^+e^-X$

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

3097.5 ±0.3			GRIBUSHIN	96	FMPS	515 π^- Be $\to 2\mu X$
3098.4 ±2.0	38k		LEMOIGNE	82	GOLI	185 π^- Be $\to$ $\gamma\mu^+\mu^-$ A
3096.93 ±0.09	502	[3]	ZHOLENTZ	80	REDE	e^+e^-
3097.0 ±1		[4]	BRANDELIK	79C	DASP	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 $\psi(2S)$ mass from AULCHENKO 03.
[3] Superseded by ARTAMONOV 00.
[4] From a simultaneous fit to e^+e^-, $\mu^+\mu^-$ and hadronic channels assuming $\Gamma(e^+e^-)$ $= \Gamma(\mu^+\mu^-)$.

$J/\psi(1S)$ WIDTH

VALUE (keV)	EVTS		DOCUMENT ID		TECN	COMMENT
92.9± 2.8 OUR AVERAGE Error includes scale factor of 1.1.						
96.1± 3.2	13k	[5]	ADAMS	06A	CLEO	$e^+e^- \to \mu^+\mu^-\gamma$
84.4± 8.9			BAI	95B	BES	e^+e^-
91 ±11 ±6		[6]	ARMSTRONG	93B	E760	$\overline{p}p \to e^+e^-$
85.5$^{+\,6.1}_{-\,5.8}$		[7]	HSUEH	92	RVUE	See Υ mini-review

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

94.1± 2.7		[8]	ANASHIN	10	KEDR	3.097 $e^+e^- \to e^+e^-$, $\mu^+\mu^-$
93.7± 3.5	7.8k	[5]	AUBERT	04	BABR	$e^+e^- \to \mu^+\mu^-\gamma$

[5] Calculated by us from the reported values of $\Gamma(e^+e^-)\times B(\mu^+\mu^-)$ using $B(e^+e^-) = (5.94 \pm 0.06)\%$ and $B(\mu^+\mu^-) = (5.93 \pm 0.06)\%$.
[6] The initial-state radiation correction reevaluated by ANDREOTTI 07 in its Ref. [4].
[7] Using data from COFFMAN 92, BALDINI-CELIO 75, BOYARSKI 75, ESPOSITO 75B, BRANDELIK 79C.
[8] Assuming $\Gamma(e^+e^-) = \Gamma(\mu^+\mu^-)$ and using $\Gamma(e^+e^-)/\Gamma_{total} = (5.94 \pm 0.06)\%$.

$J/\psi(1S)$ DECAY MODES

	Mode		Fraction (Γ_i/Γ)	Scale factor/ Confidence level
Γ_1	hadrons		$(87.7 \pm 0.5\ )\%$	
Γ_2	virtual $\gamma \rightarrow$ hadrons		$(13.50 \pm 0.30\ )\%$	
Γ_3	ggg		$(64.1 \pm 1.0\ )\%$	
Γ_4	γgg		$(\ 8.8 \pm 0.5\ )\%$	
Γ_5	$e^+ e^-$		$(\ 5.94 \pm 0.06\ )\%$	
Γ_6	$e^+ e^- \gamma$	[a]	$(\ 8.8 \pm 1.4\ )\times 10^{-3}$	
Γ_7	$\mu^+ \mu^-$		$(\ 5.93 \pm 0.06\ )\%$	

Decays involving hadronic resonances

	Mode		Fraction (Γ_i/Γ)	Scale factor/ Confidence level
Γ_8	$\rho\pi$		$(\ 1.69 \pm 0.15\ )\%$	S=2.4
Γ_9	$\rho^0 \pi^0$		$(\ 5.6 \pm 0.7\ )\times 10^{-3}$	
Γ_{10}	$a_2(1320)\rho$		$(\ 1.09 \pm 0.22\ )\%$	
Γ_{11}	$\omega\pi^+\pi^+\pi^-\pi^-$		$(\ 8.5 \pm 3.4\ )\times 10^{-3}$	
Γ_{12}	$\omega\pi^+\pi^-\pi^0$		$(\ 4.0 \pm 0.7\ )\times 10^{-3}$	
Γ_{13}	$\omega\pi^+\pi^-$		$(\ 8.6 \pm 0.7\ )\times 10^{-3}$	S=1.1
Γ_{14}	$\omega f_2(1270)$		$(\ 4.3 \pm 0.6\ )\times 10^{-3}$	
Γ_{15}	$K^*(892)^0 \overline{K}^*(892)^0$		$(\ 2.3 \pm 0.7\ )\times 10^{-4}$	
Γ_{16}	$K^*(892)^\pm \overline{K}^*(892)^\mp$		$(\ 1.00 {}^{+0.22}_{-0.40})\times 10^{-3}$	
Γ_{17}	$K^*(892)^\pm \overline{K}^*(800)^\mp$		$(\ 1.1 {}^{+1.0}_{-0.6})\times 10^{-3}$	
Γ_{18}	$\eta K^*(892)^0 \overline{K}^*(892)^0$		$(\ 1.15 \pm 0.26\ )\times 10^{-3}$	
Γ_{19}	$K^*(892)^0 \overline{K}_2^*(1430)^0 +$ c.c.		$(\ 6.0 \pm 0.6\ )\times 10^{-3}$	
Γ_{20}	$K^*(892)^0 \overline{K}_2(1770)^0 +$ c.c. $\rightarrow$ $K^*(892)^0 K^- \pi^+ +$ c.c.		$(\ 6.9 \pm 0.9\ )\times 10^{-4}$	
Γ_{21}	$\omega K^*(892)\overline{K} +$ c.c.		$(\ 6.1 \pm 0.9\ )\times 10^{-3}$	
Γ_{22}	$K^+ \overline{K}^*(892)^- +$ c.c.		$(\ 5.12 \pm 0.30\ )\times 10^{-3}$	
Γ_{23}	$K^+ \overline{K}^*(892)^- +$ c.c. $\rightarrow$ $K^+ K^- \pi^0$		$(\ 1.97 \pm 0.20\ )\times 10^{-3}$	
Γ_{24}	$K^+ \overline{K}^*(892)^- +$ c.c. $\rightarrow$ $K^0 K^\pm \pi^\mp$		$(\ 3.0 \pm 0.4\ )\times 10^{-3}$	
Γ_{25}	$K^0 \overline{K}^*(892)^0 +$ c.c.		$(\ 4.39 \pm 0.31\ )\times 10^{-3}$	
Γ_{26}	$K^0 \overline{K}^*(892)^0 +$ c.c. $\rightarrow$ $K^0 K^\pm \pi^\mp$		$(\ 3.2 \pm 0.4\ )\times 10^{-3}$	
Γ_{27}	$K_1(1400)^\pm K^\mp$		$(\ 3.8 \pm 1.4\ )\times 10^{-3}$	
Γ_{28}	$\overline{K}^*(892)^0 K^+ \pi^- +$ c.c.		seen	
Γ_{29}	$\omega\pi^0\pi^0$		$(\ 3.4 \pm 0.8\ )\times 10^{-3}$	
Γ_{30}	$b_1(1235)^\pm \pi^\mp$	[b]	$(\ 3.0 \pm 0.5\ )\times 10^{-3}$	
Γ_{31}	$\omega K^\pm K_S^0 \pi^\mp$	[b]	$(\ 3.4 \pm 0.5\ )\times 10^{-3}$	
Γ_{32}	$b_1(1235)^0 \pi^0$		$(\ 2.3 \pm 0.6\ )\times 10^{-3}$	
Γ_{33}	$\eta K^\pm K_S^0 \pi^\mp$	[b]	$(\ 2.2 \pm 0.4\ )\times 10^{-3}$	
Γ_{34}	$\phi K^*(892)\overline{K} +$ c.c.		$(\ 2.18 \pm 0.23\ )\times 10^{-3}$	

Γ_{35}	$\omega K \overline{K}$		(1.6	± 0.5) $\times 10^{-4}$	
Γ_{36}	$\omega f_0(1710) \rightarrow \omega K \overline{K}$		(4.8	± 1.1) $\times 10^{-4}$	
Γ_{37}	$\phi 2(\pi^+ \pi^-)$		(1.66	± 0.23) $\times 10^{-3}$	
Γ_{38}	$\Delta(1232)^{++} \overline{p} \pi^-$		(1.6	± 0.5) $\times 10^{-3}$	
Γ_{39}	$\omega \eta$		(1.74	± 0.20) $\times 10^{-3}$	S=1.6
Γ_{40}	$\phi K \overline{K}$		(1.83	± 0.24) $\times 10^{-3}$	S=1.5
Γ_{41}	$\phi f_0(1710) \rightarrow \phi K \overline{K}$		(3.6	± 0.6) $\times 10^{-4}$	
Γ_{42}	$\phi f_2(1270)$		(7.2	± 1.3) $\times 10^{-4}$	
Γ_{43}	$\Delta(1232)^{++} \overline{\Delta}(1232)^{--}$		(1.10	± 0.29) $\times 10^{-3}$	
Γ_{44}	$\Sigma(1385)^- \overline{\Sigma}(1385)^+$ (or c.c.)	[b]	(1.03	± 0.13) $\times 10^{-3}$	
Γ_{45}	$\phi f_2'(1525)$		(8	± 4) $\times 10^{-4}$	S=2.7
Γ_{46}	$\phi \pi^+ \pi^-$		(8.7	± 0.8) $\times 10^{-4}$	
Γ_{47}	$\phi \pi^0 \pi^0$		(5.6	± 1.6) $\times 10^{-4}$	
Γ_{48}	$\phi K^{\pm} K_S^0 \pi^{\mp}$	[b]	(7.2	± 0.8) $\times 10^{-4}$	
Γ_{49}	$\omega f_1(1420)$		(6.8	± 2.4) $\times 10^{-4}$	
Γ_{50}	$\phi \eta$		(7.5	± 0.8) $\times 10^{-4}$	S=1.5
Γ_{51}	$\Xi^0 \overline{\Xi}^0$		(1.20	± 0.24) $\times 10^{-3}$	
Γ_{52}	$\Xi(1530)^- \overline{\Xi}^+$		(5.9	± 1.5) $\times 10^{-4}$	
Γ_{53}	$p K^- \overline{\Sigma}(1385)^0$		(5.1	± 3.2) $\times 10^{-4}$	
Γ_{54}	$\omega \pi^0$		(4.5	± 0.5) $\times 10^{-4}$	S=1.4
Γ_{55}	$\phi \eta'(958)$		(4.0	± 0.7) $\times 10^{-4}$	S=2.1
Γ_{56}	$\phi f_0(980)$		(3.2	± 0.9) $\times 10^{-4}$	S=1.9
Γ_{57}	$\phi f_0(980) \rightarrow \phi \pi^+ \pi^-$		(2.2	± 0.4) $\times 10^{-4}$	
Γ_{58}	$\phi f_0(980) \rightarrow \phi \pi^0 \pi^0$		(1.7	± 0.7) $\times 10^{-4}$	
Γ_{59}	$\eta \phi f_0(980) \rightarrow \eta \phi \pi^+ \pi^-$		(3.2	± 1.0) $\times 10^{-4}$	
Γ_{60}	$\Xi(1530)^0 \overline{\Xi}^0$		(3.2	± 1.4) $\times 10^{-4}$	
Γ_{61}	$\Sigma(1385)^- \overline{\Sigma}^+$ (or c.c.)	[b]	(3.1	± 0.5) $\times 10^{-4}$	
Γ_{62}	$\phi f_1(1285)$		(2.6	± 0.5) $\times 10^{-4}$	S=1.1
Γ_{63}	$\eta \pi^+ \pi^-$		(4.0	± 1.7) $\times 10^{-4}$	
Γ_{64}	$\rho \eta$		(1.93	± 0.23) $\times 10^{-4}$	
Γ_{65}	$\omega \eta'(958)$		(1.82	± 0.21) $\times 10^{-4}$	
Γ_{66}	$\omega f_0(980)$		(1.4	± 0.5) $\times 10^{-4}$	
Γ_{67}	$\rho \eta'(958)$		(1.05	± 0.18) $\times 10^{-4}$	
Γ_{68}	$a_2(1320)^{\pm} \pi^{\mp}$	[b]	< 4.3	$\times 10^{-3}$	CL=90%
Γ_{69}	$K \overline{K}_2^*(1430) +$ c.c.		< 4.0	$\times 10^{-3}$	CL=90%
Γ_{70}	$K_1(1270)^{\pm} K^{\mp}$		< 3.0	$\times 10^{-3}$	CL=90%
Γ_{71}	$K_2^*(1430)^0 \overline{K}_2^*(1430)^0$		< 2.9	$\times 10^{-3}$	CL=90%
Γ_{72}	$\phi \pi^0$		< 6.4	$\times 10^{-6}$	CL=90%
Γ_{73}	$\phi \eta(1405) \rightarrow \phi \eta \pi \pi$		< 2.5	$\times 10^{-4}$	CL=90%
Γ_{74}	$\omega f_2'(1525)$		< 2.2	$\times 10^{-4}$	CL=90%
Γ_{75}	$\eta \phi(2170) \rightarrow$ $\eta K^*(892)^0 \overline{K}^*(892)^0$		< 2.52	$\times 10^{-4}$	CL=90%
Γ_{76}	$\Sigma(1385)^0 \overline{\Lambda}$		< 2	$\times 10^{-4}$	CL=90%
Γ_{77}	$\Delta(1232)^+ \overline{p}$		< 1	$\times 10^{-4}$	CL=90%

Γ_{78}	$\Theta(1540)\overline{\Theta}(1540) \rightarrow$ $K_S^0\,p\,K^-\,\overline{n}+$ c.c.		$<$ 1.1	$\times 10^{-5}$	CL=90%
Γ_{79}	$\Theta(1540)\,K^-\,\overline{n} \rightarrow K_S^0\,p\,K^-\,\overline{n}$		$<$ 2.1	$\times 10^{-5}$	CL=90%
Γ_{80}	$\Theta(1540)\,K_S^0\,\overline{p} \rightarrow K_S^0\,\overline{p}\,K^+\,n$		$<$ 1.6	$\times 10^{-5}$	CL=90%
Γ_{81}	$\overline{\Theta}(1540)\,K^+\,n \rightarrow K_S^0\,\overline{p}\,K^+\,n$		$<$ 5.6	$\times 10^{-5}$	CL=90%
Γ_{82}	$\overline{\Theta}(1540)\,K_S^0\,p \rightarrow K_S^0\,p\,K^-\,\overline{n}$		$<$ 1.1	$\times 10^{-5}$	CL=90%
Γ_{83}	$\Sigma^0\overline{\Lambda}$		$<$ 9	$\times 10^{-5}$	CL=90%

Decays into stable hadrons

Γ_{84}	$2(\pi^+\pi^-)\pi^0$		(5.5 ±0.4) %		
Γ_{85}	$3(\pi^+\pi^-)\pi^0$		(2.9 ±0.6) %		
Γ_{86}	$\pi^+\pi^-\pi^0$		(2.07 ±0.12) %		S=1.6
Γ_{87}	$\pi^+\pi^-\pi^0 K^+ K^-$		(1.94 ±0.15) %		
Γ_{88}	$4(\pi^+\pi^-)\pi^0$		(9.0 ±3.0) $\times 10^{-3}$		
Γ_{89}	$\pi^+\pi^- K^+ K^-$		(6.6 ±0.5) $\times 10^{-3}$		
Γ_{90}	$\pi^+\pi^- K^+ K^-\eta$		(1.84 ±0.28) $\times 10^{-3}$		
Γ_{91}	$\pi^0\pi^0 K^+ K^-$		(2.45 ±0.31) $\times 10^{-3}$		
Γ_{92}	$K\overline{K}\pi$		(6.1 ±1.0) $\times 10^{-3}$		
Γ_{93}	$2(\pi^+\pi^-)$		(3.55 ±0.23) $\times 10^{-3}$		
Γ_{94}	$3(\pi^+\pi^-)$		(4.3 ±0.4) $\times 10^{-3}$		
Γ_{95}	$2(\pi^+\pi^-\pi^0)$		(1.61 ±0.21) %		
Γ_{96}	$2(\pi^+\pi^-)\eta$		(2.29 ±0.24) $\times 10^{-3}$		
Γ_{97}	$3(\pi^+\pi^-)\eta$		(7.2 ±1.5) $\times 10^{-4}$		
Γ_{98}	$p\overline{p}$		(2.17 ±0.07) $\times 10^{-3}$		
Γ_{99}	$p\overline{p}\pi^0$		(1.19 ±0.08) $\times 10^{-3}$		S=1.1
Γ_{100}	$p\overline{p}\pi^+\pi^-$		(6.0 ±0.5) $\times 10^{-3}$		S=1.3
Γ_{101}	$p\overline{p}\pi^+\pi^-\pi^0$	[c]	(2.3 ±0.9) $\times 10^{-3}$		S=1.9
Γ_{102}	$p\overline{p}\eta$		(2.00 ±0.12) $\times 10^{-3}$		
Γ_{103}	$p\overline{p}\rho$		$<$ 3.1 $\times 10^{-4}$		CL=90%
Γ_{104}	$p\overline{p}\omega$		(1.10 ±0.15) $\times 10^{-3}$		S=1.3
Γ_{105}	$p\overline{p}\eta'(958)$		(2.1 ±0.4) $\times 10^{-4}$		
Γ_{106}	$p\overline{p}\phi$		(4.5 ±1.5) $\times 10^{-5}$		
Γ_{107}	$n\overline{n}$		(2.2 ±0.4) $\times 10^{-3}$		
Γ_{108}	$n\overline{n}\pi^+\pi^-$		(4 ±4) $\times 10^{-3}$		
Γ_{109}	$\Sigma^+\overline{\Sigma}^-$		(1.50 ±0.24) $\times 10^{-3}$		
Γ_{110}	$\Sigma^0\overline{\Sigma}^0$		(1.29 ±0.09) $\times 10^{-3}$		
Γ_{111}	$2(\pi^+\pi^-)K^+ K^-$		(5.0 ±0.5) $\times 10^{-3}$		
Γ_{112}	$p\overline{n}\pi^-$		(2.12 ±0.09) $\times 10^{-3}$		
Γ_{113}	$n\,N(1440)$		seen		
Γ_{114}	$n\,N(1520)$		seen		
Γ_{115}	$n\,N(1535)$		seen		
Γ_{116}	$\Xi^-\overline{\Xi}^+$		(8.5 ±1.6) $\times 10^{-4}$		S=1.5
Γ_{117}	$\Lambda\overline{\Lambda}$		(1.61 ±0.15) $\times 10^{-3}$		S=2.0
Γ_{118}	$\Lambda\overline{\Sigma}^-\pi^+$ (or c.c.)	[b]	(8.3 ±0.7) $\times 10^{-4}$		S=1.2

Γ_{119}	$p K^- \overline{\Lambda}$	$(8.9 \pm 1.6) \times 10^{-4}$	
Γ_{120}	$2(K^+ K^-)$	$(7.6 \pm 0.9) \times 10^{-4}$	
Γ_{121}	$p K^- \overline{\Sigma}^0$	$(2.9 \pm 0.8) \times 10^{-4}$	
Γ_{122}	$K^+ K^-$	$(2.37 \pm 0.31) \times 10^{-4}$	
Γ_{123}	$K^0_S K^0_L$	$(1.46 \pm 0.26) \times 10^{-4}$	S=2.7
Γ_{124}	$\Lambda \overline{\Lambda} \eta$	$(2.6 \pm 0.7) \times 10^{-4}$	
Γ_{125}	$\Lambda \overline{\Lambda} \pi^0$	$< 6.4 \times 10^{-5}$	CL=90%
Γ_{126}	$\overline{\Lambda} n K^0_S +$ c.c.	$(6.5 \pm 1.1) \times 10^{-4}$	
Γ_{127}	$\pi^+ \pi^-$	$(1.47 \pm 0.23) \times 10^{-4}$	
Γ_{128}	$\Lambda \overline{\Sigma} +$ c.c.	$< 1.5 \times 10^{-4}$	CL=90%
Γ_{129}	$K^0_S K^0_S$	$< 1 \times 10^{-6}$	CL=95%

Radiative decays

Γ_{130}	3γ		$(1.2 \pm 0.4) \times 10^{-5}$	
Γ_{131}	4γ		$< 9 \times 10^{-6}$	CL=90%
Γ_{132}	5γ		$< 1.5 \times 10^{-5}$	CL=90%
Γ_{133}	$\gamma \eta_c(1S)$		$(1.7 \pm 0.4) \%$	S=1.6
Γ_{134}	$\gamma \eta_c(1S) \to 3\gamma$		$(1.2 ^{+2.7}_{-1.1}) \times 10^{-6}$	
Γ_{135}	$\gamma \pi^+ \pi^- 2\pi^0$		$(8.3 \pm 3.1) \times 10^{-3}$	
Γ_{136}	$\gamma \eta \pi \pi$		$(6.1 \pm 1.0) \times 10^{-3}$	
Γ_{137}	$\gamma \eta_2(1870) \to \gamma \eta \pi^+ \pi^-$		$(6.2 \pm 2.4) \times 10^{-4}$	
Γ_{138}	$\gamma \eta(1405/1475) \to \gamma K \overline{K} \pi$	[d]	$(2.8 \pm 0.6) \times 10^{-3}$	S=1.6
Γ_{139}	$\gamma \eta(1405/1475) \to \gamma \gamma \rho^0$		$(7.8 \pm 2.0) \times 10^{-5}$	S=1.8
Γ_{140}	$\gamma \eta(1405/1475) \to \gamma \eta \pi^+ \pi^-$		$(3.0 \pm 0.5) \times 10^{-4}$	
Γ_{141}	$\gamma \eta(1405/1475) \to \gamma \gamma \phi$		$< 8.2 \times 10^{-5}$	CL=95%
Γ_{142}	$\gamma \rho \rho$		$(4.5 \pm 0.8) \times 10^{-3}$	
Γ_{143}	$\gamma \rho \omega$		$< 5.4 \times 10^{-4}$	CL=90%
Γ_{144}	$\gamma \rho \phi$		$< 8.8 \times 10^{-5}$	CL=90%
Γ_{145}	$\gamma \eta'(958)$		$(5.16 \pm 0.15) \times 10^{-3}$	S=1.1
Γ_{146}	$\gamma 2\pi^+ 2\pi^-$		$(2.8 \pm 0.5) \times 10^{-3}$	S=1.9
Γ_{147}	$\gamma f_2(1270) f_2(1270)$		$(9.5 \pm 1.7) \times 10^{-4}$	
Γ_{148}	$\gamma f_2(1270) f_2(1270)$ (non resonant)		$(8.2 \pm 1.9) \times 10^{-4}$	
Γ_{149}	$\gamma K^+ K^- \pi^+ \pi^-$		$(2.1 \pm 0.6) \times 10^{-3}$	
Γ_{150}	$\gamma f_4(2050)$		$(2.7 \pm 0.7) \times 10^{-3}$	
Γ_{151}	$\gamma \omega \omega$		$(1.61 \pm 0.33) \times 10^{-3}$	
Γ_{152}	$\gamma \eta(1405/1475) \to \gamma \rho^0 \rho^0$		$(1.7 \pm 0.4) \times 10^{-3}$	S=1.3
Γ_{153}	$\gamma f_2(1270)$		$(1.43 \pm 0.11) \times 10^{-3}$	
Γ_{154}	$\gamma f_0(1710) \to \gamma K \overline{K}$		$(8.5 ^{+1.2}_{-0.9}) \times 10^{-4}$	S=1.2
Γ_{155}	$\gamma f_0(1710) \to \gamma \pi \pi$		$(4.0 \pm 1.0) \times 10^{-4}$	
Γ_{156}	$\gamma f_0(1710) \to \gamma \omega \omega$		$(3.1 \pm 1.0) \times 10^{-4}$	
Γ_{157}	$\gamma \eta$		$(1.104 \pm 0.034) \times 10^{-3}$	
Γ_{158}	$\gamma f_1(1420) \to \gamma K \overline{K} \pi$		$(7.9 \pm 1.3) \times 10^{-4}$	

Γ_{159}	$\gamma f_1(1285)$		(6.1	± 0.8	) $\times 10^{-4}$	
Γ_{160}	$\gamma f_1(1510) \rightarrow \gamma \eta \pi^+ \pi^-$		(4.5	± 1.2	) $\times 10^{-4}$	
Γ_{161}	$\gamma f_2'(1525)$		(4.5	$^{+0.7}_{-0.4}$	) $\times 10^{-4}$	
Γ_{162}	$\gamma f_2(1640) \rightarrow \gamma \omega \omega$		(2.8	± 1.8	) $\times 10^{-4}$	
Γ_{163}	$\gamma f_2(1910) \rightarrow \gamma \omega \omega$		(2.0	± 1.4	) $\times 10^{-4}$	
Γ_{164}	$\gamma f_2(1950) \rightarrow$ $\gamma K^*(892) \overline{K}^*(892)$		(7.0	± 2.2	) $\times 10^{-4}$	
Γ_{165}	$\gamma K^*(892) \overline{K}^*(892)$		(4.0	± 1.3	) $\times 10^{-3}$	
Γ_{166}	$\gamma \phi \phi$		(4.0	± 1.2	) $\times 10^{-4}$	S=2.1
Γ_{167}	$\gamma p \overline{p}$		(3.8	± 1.0	) $\times 10^{-4}$	
Γ_{168}	$\gamma \eta(2225)$		(3.3	± 0.5	) $\times 10^{-4}$	
Γ_{169}	$\gamma \eta(1760) \rightarrow \gamma \rho^0 \rho^0$		(1.3	± 0.9	) $\times 10^{-4}$	
Γ_{170}	$\gamma \eta(1760) \rightarrow \gamma \omega \omega$		(1.98	± 0.33	) $\times 10^{-3}$	
Γ_{171}	$\gamma X(1835) \rightarrow \gamma \pi^+ \pi^- \eta'$		(2.6	± 0.4	) $\times 10^{-4}$	
Γ_{172}	$\gamma X(1835) \rightarrow \gamma p \overline{p}$		(7.5	$^{+1.9}_{-0.9}$	) $\times 10^{-5}$	
Γ_{173}	$\gamma(K \overline{K} \pi)\ [J^{PC} = 0^{-+}]$		(7	± 4	) $\times 10^{-4}$	S=2.1
Γ_{174}	$\gamma \pi^0$		(3.49	$^{+0.33}_{-0.30}$	) $\times 10^{-5}$	
Γ_{175}	$\gamma p \overline{p} \pi^+ \pi^-$		< 7.9		$\times 10^{-4}$	CL=90%
Γ_{176}	$\gamma \Lambda \overline{\Lambda}$		< 1.3		$\times 10^{-4}$	CL=90%
Γ_{177}	$\gamma f_0(2200)$					
Γ_{178}	$\gamma f_J(2220)$		> 2.50		$\times 10^{-3}$	CL=99.9%
Γ_{179}	$\gamma f_J(2220) \rightarrow \gamma \pi \pi$		(8	± 4	) $\times 10^{-5}$	
Γ_{180}	$\gamma f_J(2220) \rightarrow \gamma K \overline{K}$		< 3.6		$\times 10^{-5}$	
Γ_{181}	$\gamma f_J(2220) \rightarrow \gamma p \overline{p}$		(1.5	± 0.8	) $\times 10^{-5}$	
Γ_{182}	$\gamma f_0(1500)$		(1.01	± 0.32	) $\times 10^{-4}$	
Γ_{183}	$\gamma A \rightarrow \gamma$ invisible	[e]	< 6.3		$\times 10^{-6}$	CL=90%

Weak decays

Γ_{184}	$D^- e^+ \nu_e +$ c.c.		< 1.2	$\times 10^{-5}$	CL=90%
Γ_{185}	$\overline{D}^0 e^+ e^- +$ c.c.		< 1.1	$\times 10^{-5}$	CL=90%
Γ_{186}	$D_s^- e^+ \nu_e +$ c.c.		< 3.6	$\times 10^{-5}$	CL=90%
Γ_{187}	$D^- \pi^+ +$ c.c.		< 7.5	$\times 10^{-5}$	CL=90%
Γ_{188}	$\overline{D}^0 \overline{K}^0 +$ c.c.		< 1.7	$\times 10^{-4}$	CL=90%
Γ_{189}	$D_s^- \pi^+ +$ c.c.		< 1.3	$\times 10^{-4}$	CL=90%

Charge conjugation (C), Parity (P), Lepton Family number (LF) violating modes

Γ_{190}	$\gamma \gamma$	C	< 5	$\times 10^{-6}$	CL=90%
Γ_{191}	$e^\pm \mu^\mp$	LF	< 1.1	$\times 10^{-6}$	CL=90%
Γ_{192}	$e^\pm \tau^\mp$	LF	< 8.3	$\times 10^{-6}$	CL=90%
Γ_{193}	$\mu^\pm \tau^\mp$	LF	< 2.0	$\times 10^{-6}$	CL=90%

Other decays

Γ_{194} invisible < 7 $\times 10^{-4}$ CL=90%

[a] For $E_\gamma > 100$ MeV.

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

[c] Includes $p\overline{p}\pi^+\pi^-\gamma$ and excludes $p\overline{p}\eta$, $p\overline{p}\omega$, $p\overline{p}\eta'$.

[d] See the "Note on the $\eta(1405)$" in the $\eta(1405)$ Particle Listings.

[e] For a narrow state A with mass less than 960 MeV.

$J/\psi(1S)$ PARTIAL WIDTHS

Γ(hadrons) Γ_1

VALUE (keV)	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
74.1 ± 8.1	BAI	95B	BES	e^+e^-
59 ± 24	BALDINI-...	75	FRAG	e^+e^-
59 ± 14	BOYARSKI	75	MRK1	e^+e^-
50 ± 25	ESPOSITO	75B	FRAM	e^+e^-

$\Gamma(e^+e^-)$ Γ_5

VALUE (keV)	EVTS	DOCUMENT ID		TECN	COMMENT
5.55$\pm$0.14$\pm$0.02 OUR EVALUATION					
• • • We do not use the following data for averages, fits, limits, etc. • • •					
5.71 ± 0.16	13k	[9] ADAMS	06A	CLEO	$e^+e^- \to \mu^+\mu^-\gamma$
5.57 ± 0.19	7.8k	[9] AUBERT	04	BABR	$e^+e^- \to \mu^+\mu^-\gamma$
5.14 ± 0.39		BAI	95B	BES	e^+e^-
$5.36^{+0.29}_{-0.28}$		[10] HSUEH	92	RVUE	See Υ mini-review
4.72 ± 0.35		ALEXANDER	89	RVUE	See Υ mini-review
4.4 ± 0.6		[10] BRANDELIK	79C	DASP	e^+e^-
4.6 ± 0.8		[11] BALDINI-...	75	FRAG	e^+e^-
4.8 ± 0.6		BOYARSKI	75	MRK1	e^+e^-
4.6 ± 1.0		ESPOSITO	75B	FRAM	e^+e^-

[9] Calculated by us from the reported values of $\Gamma(e^+e^-)\times B(\mu^+\mu^-)$ using $B(\mu^+\mu^-) = (5.93 \pm 0.06)\%$.

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

[11] Assuming equal partial widths for e^+e^- and $\mu^+\mu^-$.

$\Gamma(\mu^+\mu^-)$ Γ_7

VALUE (keV)	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
5.13 ± 0.52	BAI	95B	BES	e^+e^-
4.8 ± 0.6	BOYARSKI	75	MRK1	e^+e^-
5 ± 1	ESPOSITO	75B	FRAM	e^+e^-

$\Gamma(\gamma\gamma)$ $\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ Γ_{190}

VALUE (eV)	CL%	DOCUMENT ID		TECN	COMMENT
<5.4	90	BRANDELIK	79C	DASP	e^+e^-

$J/\psi(1S)$ $\Gamma(i)\Gamma(e^+e^-)/\Gamma(\text{total})$

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.

$\Gamma(\text{hadrons}) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ $\qquad\qquad\qquad\qquad$ $\Gamma_1\Gamma_5/\Gamma$

VALUE (keV)		DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
4 ±0.8	[12]	BALDINI-...	75	FRAG	e^+e^-
3.9±0.8	[12]	ESPOSITO	75B	FRAM	e^+e^-

[12] Data redundant with branching ratios or partial widths above.

$\Gamma(e^+e^-) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ $\qquad\qquad\qquad\qquad$ $\Gamma_5\Gamma_5/\Gamma$

VALUE (eV)		DOCUMENT ID		TECN	COMMENT
332.3$\pm$ 6.4$\pm$4.8		ANASHIN	10	KEDR	3.097 $e^+e^- \to e^+e^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
350 $\pm$ 20		BRANDELIK	79C	DASP	e^+e^-
320 $\pm$ 70	[13]	BALDINI-...	75	FRAG	e^+e^-
340 $\pm$ 90	[13]	ESPOSITO	75B	FRAM	e^+e^-
360 ±100	[13]	FORD	75	SPEC	e^+e^-

[13] Data redundant with branching ratios or partial widths above.

$\Gamma(\mu^+\mu^-) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ $\qquad\qquad\qquad\qquad$ $\Gamma_7\Gamma_5/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID		TECN	COMMENT
334 $\pm$ 5 OUR AVERAGE					
331.8$\pm$ 5.2$\pm$6.3		ANASHIN	10	KEDR	3.097 $e^+e^- \to \mu^+\mu^-$
338.4$\pm$ 5.8$\pm$7.1	13k	ADAMS	06A	CLEO	$e^+e^- \to \mu^+\mu^-\gamma$
330.1$\pm$ 7.7$\pm$7.3	7.8k	AUBERT	04	BABR	$e^+e^- \to \mu^+\mu^-\gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
510 ±90		DASP	75	DASP	e^+e^-
380 ±50	[14]	ESPOSITO	75B	FRAM	e^+e^-

[14] Data redundant with branching ratios or partial widths above.

$\Gamma(\omega\pi^+\pi^-\pi^0) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ $\qquad\qquad\qquad$ $\Gamma_{12}\Gamma_5/\Gamma$

VALUE (10^{-2} keV)	EVTS	DOCUMENT ID		TECN	COMMENT
2.2$\pm$0.3$\pm$0.2	170	AUBERT	06D	BABR	10.6 $e^+e^- \to \omega\pi^+\pi^-\pi^0\gamma$

$\Gamma(\omega\pi^+\pi^-) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\Gamma_{13}\Gamma_5/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
53.6±5.0±0.4	788	[15] AUBERT 07AU	BABR	10.6 $e^+e^- \to \omega\pi^+\pi^-\gamma$

[15] AUBERT 07AU reports [$\Gamma(J/\psi(1S) \to \omega\pi^+\pi^-) \times \Gamma(J/\psi(1S) \to e^+e^-)/\Gamma_{total}$] $\times$ [B$(\omega(782) \to \pi^+\pi^-\pi^0)$] = 47.8 ± 3.1 ± 3.2 eV which we divide by our best value B$(\omega(782) \to \pi^+\pi^-\pi^0)$ = (89.2 ± 0.7) × 10^{-2}. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(K^*(892)^0\overline{K}_2^*(1430)^0 + c.c.) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\Gamma_{19}\Gamma_5/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
33±4±1	317 ± 23	[16,17] AUBERT 07AK	BABR	10.6 $e^+e^- \to \pi^+\pi^-K^+K^-\gamma$

[16] Dividing by 2/3 to take into account that B$(K^{*0} \to K^+\pi^-)$ = 2/3.

[17] AUBERT 07AK reports [$\Gamma(J/\psi(1S) \to K^*(892)^0\overline{K}_2^*(1430)^0 + c.c.) \times \Gamma(J/\psi(1S) \to e^+e^-)/\Gamma_{total}$] $\times$ [B$(K_2^*(1430) \to K\pi)$] = 16.4 ± 1.1 ± 1.4 eV which we divide by our best value B$(K_2^*(1430) \to K\pi)$ = (49.9 ± 1.2) × 10^{-2}. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(K^*(892)^0\overline{K}_2(1770)^0 + c.c. \to K^*(892)^0K^-\pi^+ + c.c.) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\Gamma_{20}\Gamma_5/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
3.8±0.4±0.3	110 ± 14	[18] AUBERT 07AK	BABR	10.6 $e^+e^- \to \pi^+\pi^-K^+K^-\gamma$

[18] Dividing by 2/3 to take into account that B$(K^{*0} \to K^+\pi^-)$ = 2/3.

$\Gamma(K^+\overline{K}^*(892)^- + c.c.) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\Gamma_{22}\Gamma_5/\Gamma$

VALUE (eV)	DOCUMENT ID	TECN	COMMENT
29.0±1.7±1.3	AUBERT 08S	BABR	10.6 $e^+e^- \to K^+K^*(892)^-\gamma$

$\Gamma(K^+\overline{K}^*(892)^- + c.c. \to K^+K^-\pi^0) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\Gamma_{23}\Gamma_5/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
10.96±0.85±0.70	155	AUBERT 08S	BABR	10.6 $e^+e^- \to K^+K^-\pi^0\gamma$

$\Gamma(K^+\overline{K}^*(892)^- + c.c. \to K^0K^\pm\pi^\mp) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\Gamma_{24}\Gamma_5/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
16.76±1.70±1.00	89	AUBERT 08S	BABR	10.6 $e^+e^- \to K_S^0K^\pm\pi^\mp\gamma$

$\Gamma(K^0\overline{K}^*(892)^0 + c.c.) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\Gamma_{25}\Gamma_5/\Gamma$

VALUE (eV)	DOCUMENT ID	TECN	COMMENT
26.6±2.5±1.5	AUBERT 08S	BABR	10.6 $e^+e^- \to K^0\overline{K}^*(892)^0\gamma$

$\Gamma(K^0\overline{K}^*(892)^0 + c.c. \to K^0K^\pm\pi^\mp) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\Gamma_{26}\Gamma_5/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
17.70±1.70±1.00	94	AUBERT 08S	BABR	10.6 $e^+e^- \to K_S^0K^\pm\pi^\mp\gamma$

$\Gamma(\omega K \overline{K}) \times \Gamma(e^+ e^-)/\Gamma_{total}$ $\qquad$ $\Gamma_{35}\Gamma_5/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID		TECN	COMMENT
3.70±1.98±0.03	24	[19] AUBERT	07AU	BABR	10.6 $e^+ e^- \to \omega K^+ K^- \gamma$

[19] AUBERT 07AU reports $[\Gamma(J/\psi(1S) \to \omega K \overline{K}) \times \Gamma(J/\psi(1S) \to e^+ e^-)/\Gamma_{total}] \times [B(\omega(782) \to \pi^+ \pi^- \pi^0)] = 3.3 \pm 1.3 \pm 1.2$ eV which we divide by our best value $B(\omega(782) \to \pi^+ \pi^- \pi^0) = (89.2 \pm 0.7) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\phi 2(\pi^+ \pi^-)) \times \Gamma(e^+ e^-)/\Gamma_{total}$ $\qquad$ $\Gamma_{37}\Gamma_5/\Gamma$

VALUE (10^{-2} keV)	EVTS	DOCUMENT ID		TECN	COMMENT
0.96±0.19±0.01	35	[20] AUBERT	06D	BABR	10.6 $e^+ e^- \to \phi 2(\pi^+ \pi^-) \gamma$

[20] AUBERT 06D reports $[\Gamma(J/\psi(1S) \to \phi 2(\pi^+ \pi^-)) \times \Gamma(J/\psi(1S) \to e^+ e^-)/\Gamma_{total}] \times [B(\phi(1020) \to K^+ K^-)] = (0.47 \pm 0.09 \pm 0.03) \times 10^{-2}$ keV which we divide by our best value $B(\phi(1020) \to K^+ K^-) = (48.9 \pm 0.5) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\phi \pi^+ \pi^-) \times \Gamma(e^+ e^-)/\Gamma_{total}$ $\qquad$ $\Gamma_{46}\Gamma_5/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID		TECN	COMMENT
4.8 ±0.4 OUR AVERAGE					
4.52±0.48±0.04	254 ± 23	[21] SHEN	09	BELL	10.6 $e^+ e^- \to$ $K^+ K^- \pi^+ \pi^- \gamma$
5.33±0.71±0.05	103	[22] AUBERT,BE	06D	BABR	10.6 $e^+ e^- \to$ $K^+ K^- \pi^+ \pi^- \gamma$

[21] SHEN 09 reports $4.50 \pm 0.41 \pm 0.26$ eV from a measurement of $[\Gamma(J/\psi(1S) \to \phi \pi^+ \pi^-) \times \Gamma(J/\psi(1S) \to e^+ e^-)/\Gamma_{total}] \times [B(\phi(1020) \to K^+ K^-)]$ assuming $B(\phi(1020) \to K^+ K^-) = (49.2 \pm 0.6) \times 10^{-2}$, which we rescale to our best value $B(\phi(1020) \to K^+ K^-) = (48.9 \pm 0.5) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[22] AUBERT,BE 06D reports $[\Gamma(J/\psi(1S) \to \phi \pi^+ \pi^-) \times \Gamma(J/\psi(1S) \to e^+ e^-)/\Gamma_{total}] \times [B(\phi(1020) \to K^+ K^-)] = 2.61 \pm 0.30 \pm 0.18$ eV which we divide by our best value $B(\phi(1020) \to K^+ K^-) = (48.9 \pm 0.5) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\phi \pi^0 \pi^0) \times \Gamma(e^+ e^-)/\Gamma_{total}$ $\qquad$ $\Gamma_{47}\Gamma_5/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID		TECN	COMMENT
3.15±0.88±0.03	23	[23] AUBERT,BE	06D	BABR	10.6 $e^+ e^- \to K^+ K^- \pi^0 \pi^0 \gamma$

[23] AUBERT,BE 06D reports $[\Gamma(J/\psi(1S) \to \phi \pi^0 \pi^0) \times \Gamma(J/\psi(1S) \to e^+ e^-)/\Gamma_{total}] \times [B(\phi(1020) \to K^+ K^-)] = 1.54 \pm 0.40 \pm 0.16$ eV which we divide by our best value $B(\phi(1020) \to K^+ K^-) = (48.9 \pm 0.5) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\phi \eta) \times \Gamma(e^+ e^-)/\Gamma_{total}$ $\qquad$ $\Gamma_{50}\Gamma_5/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID		TECN	COMMENT
6.1±2.7±0.4	6	[24] AUBERT	07AU	BABR	10.6 $e^+ e^- \to \phi \eta \gamma$

[24] AUBERT 07AU quotes $\Gamma_{ee}^{J/\psi} \cdot B(J/\psi \to \phi \eta) \cdot B(\phi \to K^+ K^-) \cdot B(\eta \to 3\pi) = 0.84 \pm 0.37 \pm 0.05$ eV.

$\Gamma(\phi f_0(980) \to \phi\pi^+\pi^-) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\qquad$ $\Gamma_{57}\Gamma_5/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
1.21±0.23 OUR AVERAGE		Error includes scale factor of 1.2.		
1.48±0.27±0.09	60±11	[25] SHEN	09 BELL	10.6 $e^+e^- \to K^+K^-\pi^+\pi^-\gamma$
1.02±0.24±0.01	20±5	[26] AUBERT	07AK BABR	10.6 $e^+e^- \to \pi^+\pi^-K^+K^-\gamma$

[25] Multiplied by 2/3 to take into account the $\phi\pi^+\pi^-$ mode only. Using B$(\phi \to K^+K^-)$ = $(49.2 \pm 0.6)\%$.

[26] AUBERT 07AK reports $[\Gamma(J/\psi(1S) \to \phi f_0(980) \to \phi\pi^+\pi^-) \times \Gamma(J/\psi(1S) \to e^+e^-)/\Gamma_{total}] \times [B(\phi(1020) \to K^+K^-)] = 0.50 \pm 0.11 \pm 0.04$ eV which we divide by our best value B$(\phi(1020) \to K^+K^-) = (48.9 \pm 0.5) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\phi f_0(980) \to \phi\pi^0\pi^0) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\qquad$ $\Gamma_{58}\Gamma_5/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
0.96±0.40±0.01	7.0±2.8	[27] AUBERT	07AK BABR	10.6 $e^+e^- \to \pi^0\pi^0K^+K^-\gamma$

[27] AUBERT 07AK reports $[\Gamma(J/\psi(1S) \to \phi f_0(980) \to \phi\pi^0\pi^0) \times \Gamma(J/\psi(1S) \to e^+e^-)/\Gamma_{total}] \times [B(\phi(1020) \to K^+K^-)] = 0.47 \pm 0.19 \pm 0.05$ eV which we divide by our best value B$(\phi(1020) \to K^+K^-) = (48.9 \pm 0.5) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\eta\pi^+\pi^-) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\qquad$ $\Gamma_{63}\Gamma_5/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
2.24±0.98±0.03	9	[28] AUBERT	07AU BABR	10.6 $e^+e^- \to \eta\pi^+\pi^-\gamma$

[28] AUBERT 07AU reports $[\Gamma(J/\psi(1S) \to \eta\pi^+\pi^-) \times \Gamma(J/\psi(1S) \to e^+e^-)/\Gamma_{total}] \times [B(\eta \to \pi^+\pi^-\pi^0)] = 0.51 \pm 0.22 \pm 0.03$ eV which we divide by our best value B$(\eta \to \pi^+\pi^-\pi^0) = (22.74 \pm 0.28) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(K^*(892)^0\overline{K}^*(892)^0) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\qquad$ $\Gamma_{15}\Gamma_5/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
1.28±0.40±0.11	25±8	[29] AUBERT	07AK BABR	10.6 $e^+e^- \to \pi^+\pi^-K^+K^-\gamma$

[29] Dividing by $(2/3)^2$ to take twice into account that B$(K^{*0} \to K^+\pi^-) = 2/3$.

$\Gamma(\phi f_2(1270)) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\qquad$ $\Gamma_{42}\Gamma_5/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
4.0±0.7±0.1	44±7	[30,31] AUBERT	07AK BABR	10.6 $e^+e^- \to \pi^+\pi^-K^+K^-\gamma$

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

[31] AUBERT 07AK reports $[\Gamma(J/\psi(1S) \to \phi f_2(1270)) \times \Gamma(J/\psi(1S) \to e^+e^-)/\Gamma_{total}] \times [B(f_2(1270) \to \pi\pi)] = 3.41 \pm 0.55 \pm 0.28$ eV which we divide by our best value B$(f_2(1270) \to \pi\pi) = (84.8^{+2.4}_{-1.2}) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(2(\pi^+\pi^-)\pi^0) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\qquad$ $\Gamma_{84}\Gamma_5/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
303± 5±18	4990	AUBERT	07AU BABR	10.6 $e^+e^- \to 2(\pi^+\pi^-)\pi^0\gamma$

$\Gamma(\pi^+\pi^-\pi^0) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\quad$ $\Gamma_{86}\Gamma_5/\Gamma$

VALUE (keV)	DOCUMENT ID	TECN	COMMENT
0.122±0.005±0.008	AUBERT,B 04N	BABR	10.6 $e^+e^- \to \pi^+\pi^-\pi^0\gamma$

$\Gamma(\pi^+\pi^-\pi^0 K^+ K^-) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\quad$ $\Gamma_{87}\Gamma_5/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
107.0±4.3±6.4	768	AUBERT 07AU	BABR	10.6 $e^+e^- \to K^+K^-\pi^+\pi^-\pi^0\gamma$

$\Gamma(\pi^+\pi^- K^+ K^-) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\quad$ $\Gamma_{89}\Gamma_5/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
36.3±1.3±2.1	1586 ± 58	AUBERT 07AK	BABR	10.6 $e^+e^- \to \pi^+\pi^- K^+ K^-\gamma$

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

33.6±2.7±2.7	233	[32] AUBERT 05D	BABR	10.6 $e^+e^- \to K^+K^-\pi^+\pi^-\gamma$

[32] Superseded by AUBERT 07AK.

$\Gamma(\pi^+\pi^- K^+ K^-\eta) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\quad$ $\Gamma_{90}\Gamma_5/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
25.9±3.9±0.1	73	[33] AUBERT 07AU	BABR	10.6 $e^+e^- \to K^+K^-\pi^+\pi^-\eta\gamma$

[33] AUBERT 07AU reports $[\Gamma(J/\psi(1S) \to \pi^+\pi^- K^+ K^-\eta) \times \Gamma(J/\psi(1S) \to e^+e^-)/\Gamma_{total}] \times [B(\eta \to 2\gamma)] = 10.2 \pm 1.3 \pm 0.8$ eV which we divide by our best value $B(\eta \to 2\gamma) = (39.31 \pm 0.20) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\pi^0\pi^0 K^+ K^-) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\quad$ $\Gamma_{91}\Gamma_5/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
13.6±1.1±1.3	203 ± 16	AUBERT 07AK	BABR	10.6 $e^+e^- \to \pi^0\pi^0 K^+ K^-\gamma$

$\Gamma(2(\pi^+\pi^-)) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\quad$ $\Gamma_{93}\Gamma_5/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
19.5±1.4±1.3	270	AUBERT 05D	BABR	10.6 $e^+e^- \to 2(\pi^+\pi^-)\gamma$

$\Gamma(3(\pi^+\pi^-)) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\quad$ $\Gamma_{94}\Gamma_5/\Gamma$

VALUE (10^{-2} keV)	EVTS	DOCUMENT ID	TECN	COMMENT
2.37±0.16±0.14	496	AUBERT 06D	BABR	10.6 $e^+e^- \to 3(\pi^+\pi^-)\gamma$

$\Gamma(2(\pi^+\pi^-\pi^0)) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\quad$ $\Gamma_{95}\Gamma_5/\Gamma$

VALUE (10^{-2} keV)	EVTS	DOCUMENT ID	TECN	COMMENT
8.9±0.5±1.0	761	AUBERT 06D	BABR	10.6 $e^+e^- \to 2(\pi^+\pi^-\pi^0)\gamma$

$\Gamma(2(\pi^+\pi^-)\eta) \times \Gamma(e^+e^-)/\Gamma_{total}$ $\quad$ $\Gamma_{96}\Gamma_5/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
13.1±2.4±0.1	85	[34] AUBERT 07AU	BABR	10.6 $e^+e^- \to 2(\pi^+\pi^-)\eta\gamma$

[34] AUBERT 07AU reports $[\Gamma(J/\psi(1S) \to 2(\pi^+\pi^-)\eta) \times \Gamma(J/\psi(1S) \to e^+e^-)/\Gamma_{total}] \times [B(\eta \to 2\gamma)] = 5.16 \pm 0.85 \pm 0.39$ eV which we divide by our best value $B(\eta \to 2\gamma) = (39.31 \pm 0.20) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(p\overline{p}) \times \Gamma(e^+ e^-)/\Gamma_{total}$ $\qquad$ $\Gamma_{98}\Gamma_5/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
11.6±0.9 OUR AVERAGE	Error includes scale factor of 1.2.			
12.0±0.6±0.5	438	AUBERT 06B		$e^+ e^- \to p\overline{p}\gamma$
9.7±1.7		[35] ARMSTRONG 93B	E760	$\overline{p}p \to e^+ e^-$

[35] Using $\Gamma_{total} = 85.5^{+6.1}_{-5.8}$ MeV.

$\Gamma(\Sigma^0\overline{\Sigma}^0) \times \Gamma(e^+ e^-)/\Gamma_{total}$ $\qquad$ $\Gamma_{110}\Gamma_5/\Gamma$

VALUE (eV)	DOCUMENT ID	TECN	COMMENT
6.4±1.2±0.6	AUBERT 07BD	BABR	10.6 $e^+ e^- \to \Sigma^0\overline{\Sigma}^0\gamma$

$\Gamma(2(\pi^+\pi^-)K^+ K^-) \times \Gamma(e^+ e^-)/\Gamma_{total}$ $\qquad$ $\Gamma_{111}\Gamma_5/\Gamma$

VALUE (10^{-2} keV)	EVTS	DOCUMENT ID	TECN	COMMENT
2.75±0.23±0.17	205	AUBERT 06D	BABR	10.6 $e^+ e^- \to$ $K^+ K^- 2(\pi^+\pi^-)\gamma$

$\Gamma(\Lambda\overline{\Lambda}) \times \Gamma(e^+ e^-)/\Gamma_{total}$ $\qquad$ $\Gamma_{117}\Gamma_5/\Gamma$

VALUE (eV)	DOCUMENT ID	TECN	COMMENT
10.7±0.9±0.7	AUBERT 07BD	BABR	10.6 $e^+ e^- \to \Lambda\overline{\Lambda}\gamma$

$\Gamma(2(K^+ K^-)) \times \Gamma(e^+ e^-)/\Gamma_{total}$ $\qquad$ $\Gamma_{120}\Gamma_5/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
4.11±0.39±0.30	156 ± 15	AUBERT 07AK	BABR	10.6 $e^+ e^- \to 2(K^+ K^-)\gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
4.0 ±0.7 ±0.6	38	[36] AUBERT 05D	BABR	10.6 $e^+ e^- \to 2(K^+ K^-)\gamma$

[36] Superseded by AUBERT 07AK.

$J/\psi(1S)$ BRANCHING RATIOS

For the first four branching ratios, see also the partial widths, and (partial widths) $\times \Gamma(e^+ e^-)/\Gamma_{total}$ above.

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

VALUE	DOCUMENT ID	TECN	COMMENT
0.877±0.005 OUR AVERAGE			
0.878±0.005	BAI 95B	BES	$e^+ e^-$
0.86 ±0.02	BOYARSKI 75	MRK1	$e^+ e^-$

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

VALUE	DOCUMENT ID	TECN	COMMENT
0.135±0.003	[37,38] SETH 04	RVUE	$e^+ e^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.17 ±0.02	[37] BOYARSKI 75	MRK1	$e^+ e^-$

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

[38] Using B($J/\psi \to \ell^+\ell^-$) = (5.90 ± 0.09)% from RPP-2002 and R = 2.28 ± 0.04 determined by a fit to data from BAI 00 and BAI 02C.

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

VALUE (units 10^{-2})	EVTS		DOCUMENT ID		TECN	COMMENT
64.1±1.0	6 M	[39] BESSON		08	CLEO	$\psi(2S) \to \pi^+\pi^- +$ hadrons

[39] Calculated using the value $\Gamma(\gamma gg)/\Gamma(ggg) = 0.137 \pm 0.001 \pm 0.016 \pm 0.004$ from BESSON 08 and the PDG 08 values of B($\ell^+\ell^-$), B(virtual $\gamma \to$ hadrons), and B($\gamma\eta_c$). The statistical error is negligible and the systematic error is partially correlated with that of $\Gamma(\gamma gg)/\Gamma_{total}$ measurement of BESSON 08.

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

VALUE (units 10^{-2})	EVTS		DOCUMENT ID		TECN	COMMENT
8.79±1.05	200 k	[40] BESSON		08	CLEO	$\psi(2S) \to \pi^+\pi^-\gamma +$ hadrons

[40] Calculated using the value $\Gamma(\gamma gg)/\Gamma(ggg) = 0.137 \pm 0.001 \pm 0.016 \pm 0.004$ from BESSON 08 and the value of $\Gamma(ggg)/\Gamma_{total}$. The statistical error is negligible and the systematic error is partially correlated with that of $\Gamma(ggg)/\Gamma_{total}$ measurement of BESSON 08.

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

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
13.7±0.1±0.7	6 M	BESSON	08	CLEO	$\psi(2S) \to \pi^+\pi^- J/\psi$

$\Gamma(e^+e^-)/\Gamma_{total}$ $\qquad\qquad$ Γ_5/Γ

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
5.94 ±0.06 OUR AVERAGE					
5.945±0.067±0.042	15k	LI	05C	CLEO	$\psi(2S) \to J/\psi\pi^+\pi^-$
5.90 ±0.05 ±0.10		BAI	98D	BES	$\psi(2S) \to J/\psi\pi^+\pi^-$
6.09 ±0.33		BAI	95B	BES	e^+e^-
5.92 ±0.15 ±0.20		COFFMAN	92	MRK3	$\psi(2S) \to J/\psi\pi^+\pi^-$
6.9 ±0.9		BOYARSKI	75	MRK1	e^+e^-

$\Gamma(e^+e^-\gamma)/\Gamma_{total}$ $\qquad\qquad$ Γ_6/Γ

VALUE (units 10^{-3})		DOCUMENT ID	TECN	COMMENT
8.8±1.3±0.4	[41] ARMSTRONG	96	E760	$\overline{p}p \to e^+e^-\gamma$

[41] For $E_\gamma > 100$ MeV.

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

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
5.93 ±0.06 OUR AVERAGE					
5.960±0.065±0.050	17k	LI	05C	CLEO	$\psi(2S) \to J/\psi\pi^+\pi^-$
5.84 ±0.06 ±0.10		BAI	98D	BES	$\psi(2S) \to J/\psi\pi^+\pi^-$
6.08 ±0.33		BAI	95B	BES	e^+e^-
5.90 ±0.15 ±0.19		COFFMAN	92	MRK3	$\psi(2S) \to J/\psi\pi^+\pi^-$
6.9 ±0.9		BOYARSKI	75	MRK1	e^+e^-

$\Gamma(e^+e^-)/\Gamma(\mu^+\mu^-)$ $\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ Γ_5/Γ_7

VALUE	DOCUMENT ID		TECN	COMMENT
0.998±0.012 OUR AVERAGE				
1.002±0.021±0.013	[42] ANASHIN	10	KEDR	3.097 $e^+e^- \to e^+e^-$, $\mu^+\mu^-$
0.997±0.012±0.006	LI	05C	CLEO	$\psi(2S) \to J/\psi\pi^+\pi^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1.00 ±0.07	BAI	95B	BES	e^+e^-
1.00 ±0.05	BOYARSKI	75	MRK1	e^+e^-
0.91 ±0.15	ESPOSITO	75B	FRAM	e^+e^-
0.93 ±0.10	FORD	75	SPEC	e^+e^-

[42] Not independent of the corresponding measurements of $\Gamma(e^+e^-) \times \Gamma(e^+e^-)/\Gamma_{total}$ and $\Gamma(\mu^+\mu^-) \times \Gamma(e^+e^-)/\Gamma_{total}$.

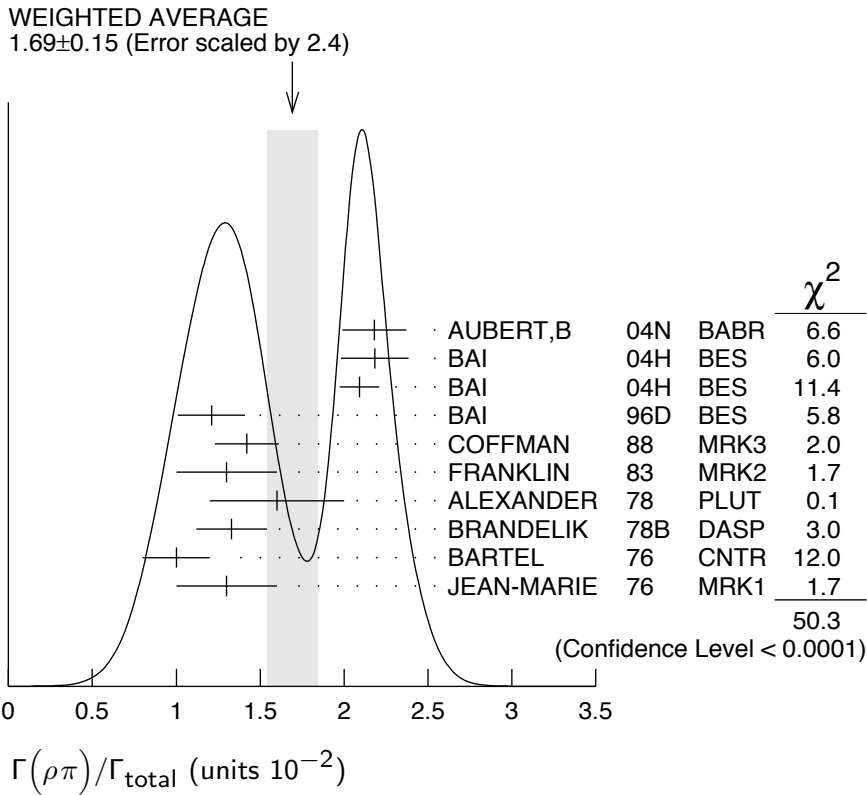———— **HADRONIC DECAYS** ————

$\Gamma(\rho\pi)/\Gamma_{total}$ $\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ Γ_8/Γ

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
1.69 ±0.15 OUR AVERAGE		Error includes scale factor of 2.4. See the ideogram below.			
2.18 ±0.19		[43,44] AUBERT,B	04N	BABR	10.6 $e^+e^- \to$ $\pi^+\pi^-\pi^0\gamma$
2.184±0.005±0.201	220k	[44,45] BAI	04H	BES	$e^+e^- \to J/\psi \to$ $\pi^+\pi^-\pi^0$
2.091±0.021±0.116		[44,46] BAI	04H	BES	$\psi(2S) \to \pi^+\pi^- J/\psi$
1.21 ±0.20		BAI	96D	BES	$e^+e^- \to \rho\pi$
1.42 ±0.01 ±0.19		COFFMAN	88	MRK3	e^+e^-
1.3 ±0.3	150	FRANKLIN	83	MRK2	e^+e^-
1.6 ±0.4	183	ALEXANDER	78	PLUT	e^+e^-
1.33 ±0.21		BRANDELIK	78B	DASP	e^+e^-
1.0 ±0.2	543	BARTEL	76	CNTR	e^+e^-
1.3 ±0.3	153	JEAN-MARIE	76	MRK1	e^+e^-

[43] From the ratio of $\Gamma(e^+e^-) B(\pi^+\pi^-\pi^0)$ and $\Gamma(e^+e^-) B(\mu^+\mu^-)$ (AUBERT 04).
[44] Not independent of their $B(\pi^+\pi^-\pi^0)$.
[45] From $J/\psi \to \pi^+\pi^-\pi^0$ events directly.
[46] Obtained comparing the rates for $\pi^+\pi^-\pi^0$ and $\mu^+\mu^-$, using J/ψ events produced via $\psi(2S) \to \pi^+\pi^- J/\psi$ and with $B(J/\psi \to \mu^+\mu^-) = 5.88 \pm 0.10\%$.

WEIGHTED AVERAGE
1.69±0.15 (Error scaled by 2.4)

			χ^2
AUBERT,B	04N	BABR	6.6
BAI	04H	BES	6.0
BAI	04H	BES	11.4
BAI	96D	BES	5.8
COFFMAN	88	MRK3	2.0
FRANKLIN	83	MRK2	1.7
ALEXANDER	78	PLUT	0.1
BRANDELIK	78B	DASP	3.0
BARTEL	76	CNTR	12.0
JEAN-MARIE	76	MRK1	1.7
			50.3

(Confidence Level < 0.0001)

$\Gamma\left(\rho\pi\right)/\Gamma_{\text{total}}$ (units 10^{-2})

$\Gamma(\rho^0\pi^0)/\Gamma(\rho\pi)$ Γ_9/Γ_8

VALUE	DOCUMENT ID		TECN	COMMENT
0.328±0.005±0.027	COFFMAN	88	MRK3	e^+e^-

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

VALUE	DOCUMENT ID		TECN	COMMENT
0.35 ±0.08	ALEXANDER	78	PLUT	e^+e^-
0.32 ±0.08	BRANDELIK	78B	DASP	e^+e^-
0.39 ±0.11	BARTEL	76	CNTR	e^+e^-
0.37 ±0.09	JEAN-MARIE	76	MRK1	e^+e^-

$\Gamma\left(a_2(1320)\rho\right)/\Gamma_{\text{total}}$ Γ_{10}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
10.9±2.2 OUR AVERAGE					
11.7±0.7±2.5	7584	AUGUSTIN	89	DM2	$J/\psi \rightarrow \rho^0\rho^\pm\pi^\mp$
8.4±4.5	36	VANNUCCI	77	MRK1	$e^+e^- \rightarrow 2(\pi^+\pi^-)\pi^0$

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

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
85±34	140	VANNUCCI	77	MRK1	$e^+e^- \rightarrow 3(\pi^+\pi^-)\pi^0$

$\Gamma\left(\omega\pi^+\pi^-\pi^0\right)/\Gamma_{\text{total}}$ Γ_{12}/Γ

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
0.40±0.06±0.04	170	[47] AUBERT	06D	BABR	10.6 $e^+e^- \rightarrow \omega\pi^+\pi^-\pi^0\gamma$

[47] Using $\Gamma(J/\psi \rightarrow e^+e^-) = 5.52 \pm 0.14 \pm 0.04$ keV.

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

VALUE (units 10^{-3})	EVTS		DOCUMENT ID		TECN	COMMENT
8.6±0.7 OUR AVERAGE			Error includes scale factor of 1.1.			
9.7±0.6±0.6	788	[48]	AUBERT	07AU	BABR	10.6 $e^+ e^- \to \omega \pi^+ \pi^- \gamma$
7.0±1.6	18058		AUGUSTIN	89	DM2	$J/\psi \to 2(\pi^+ \pi^-)\pi^0$
7.8±1.6	215		BURMESTER	77D	PLUT	$e^+ e^-$
6.8±1.9	348		VANNUCCI	77	MRK1	$e^+ e^- \to 2(\pi^+ \pi^-)\pi^0$

[48] AUBERT 07AU quotes $\Gamma_{ee}^{J/\psi} \cdot B(J/\psi \to \omega \pi^+ \pi^-) \cdot B(\omega \to 3\pi) = 47.8 \pm 3.1 \pm 3.2$ eV.

$\Gamma(\omega f_2(1270))/\Gamma_{total}$ Γ_{14}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
4.3±0.6 OUR AVERAGE					
4.3±0.2±0.6	5860	AUGUSTIN	89	DM2	$e^+ e^-$
4.0±1.6	70	BURMESTER	77D	PLUT	$e^+ e^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1.9±0.8	81	VANNUCCI	77	MRK1	$e^+ e^- \to 2(\pi^+ \pi^-)\pi^0$

$\Gamma(K^*(892)^0 \overline{K}^*(892)^0)/\Gamma_{total}$ Γ_{15}/Γ

VALUE (units 10^{-4})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
2.3±0.7±0.1		25 ± 8	[49] AUBERT	07AK	BABR	10.6 $e^+ e^- \to$ $\pi^+ \pi^- K^+ K^- \gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<5	90		VANNUCCI 77		MRK1	$e^+ e^- \to \pi^+ \pi^- K^+ K^-$

[49] AUBERT 07AK reports $[\Gamma(J/\psi(1S) \to K^*(892)^0 \overline{K}^*(892)^0)/\Gamma_{total}] \times [\Gamma(J/\psi(1S) \to e^+ e^-)] = (1.28 \pm 0.40 \pm 0.11) \times 10^{-3}$ keV which we divide by our best value $\Gamma(J/\psi(1S) \to e^+ e^-) = 5.55 \pm 0.14 \pm 0.02$ keV. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(K^*(892)^\pm \overline{K}^*(892)^\mp)/\Gamma_{total}$ Γ_{16}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
1.00±0.19$^{+0.11}_{-0.32}$	323	ABLIKIM	10E	BES2	$J/\psi \to K^\pm K_S^0 \pi^\mp \pi^0$	▌

$\Gamma(K^*(892)^\pm \overline{K}^*(800)^\mp)/\Gamma_{total}$ Γ_{17}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
1.09±0.18$^{+0.94}_{-0.54}$	655	ABLIKIM	10E	BES2	$J/\psi \to K^\pm K_S^0 \pi^\mp \pi^0$	▌

$\Gamma(\eta K^*(892)^0 \overline{K}^*(892)^0)/\Gamma_{total}$ Γ_{18}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
1.15±0.13±0.22	209	ABLIKIM	10C	BES2	$J/\psi \to \eta K^+ \pi^- K^- \pi^+$	▌

$\Gamma(K^*(892)^0 \overline{K}_2^*(1430)^0 + \text{c.c.})/\Gamma_{total}$ Γ_{19}/Γ

VALUE (units 10^{-3})	EVTS		DOCUMENT ID		TECN	COMMENT
6.0±0.6 OUR AVERAGE						
5.9±0.6±0.2	317 ± 23	[50,51]	AUBERT	07AK	BABR	10.6 $e^+ e^- \to$ $\pi^+ \pi^- K^+ K^- \gamma$
6.7±2.6	40		VANNUCCI 77		MRK1	$e^+ e^- \to \pi^+ \pi^- K^+ K^-$

[50] Using B$(K_2^*(1430)^0 \to K\pi) = (49.9 \pm 1.2)$%.

[51] AUBERT 07AK reports $[\Gamma(J/\psi(1S) \to K^*(892)^0 \overline{K}_2^*(1430)^0 + \text{c.c.})/\Gamma_{total}] \times [\Gamma(J/\psi(1S) \to e^+ e^-)] = (32.9 \pm 2.3 \pm 2.7) \times 10^{-3}$ keV which we divide by our best value $\Gamma(J/\psi(1S) \to e^+ e^-) = 5.55 \pm 0.14 \pm 0.02$ keV. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\omega K^*(892)\overline{K} + \text{c.c.})/\Gamma_{total}$ $\qquad\qquad$ Γ_{21}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
61 ± 9 OUR AVERAGE					
62.0± 6.8±10.6	899 ± 98	ABLIKIM	08E	BES2	$J/\psi \to \omega K_S^0 K^\pm \pi^\mp$
65.3±10.2±13.5	176 ± 28	ABLIKIM	08E	BES2	$J/\psi \to \omega K^+ K^- \pi^0$
53 ±14 ±14	530 ± 140	BECKER	87	MRK3	$e^+ e^- \to$ hadrons

$\Gamma(K^+ \overline{K}^*(892)^- + \text{c.c.})/\Gamma_{total}$ $\qquad\qquad$ Γ_{22}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
5.12±0.30 OUR AVERAGE					
5.2 ±0.4 ±0.1		[52] AUBERT	08S	BABR	10.6 $e^+ e^- \to K^+ K^*(892)^- \gamma$
4.57±0.17±0.70	2285	JOUSSET	90	DM2	$J/\psi \to$ hadrons
5.26±0.13±0.53		COFFMAN	88	MRK3	$J/\psi \to K^\pm K_S^0 \pi^\mp,$ $K^+ K^- \pi^0$

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

2.6 ±0.6	24	FRANKLIN	83	MRK2	$J/\psi \to K^+ K^- \pi^0$
3.2 ±0.6	48	VANNUCCI	77	MRK1	$J/\psi \to K^\pm K_S^0 \pi^\mp$
4.1 ±1.2	39	BRAUNSCH...	76	DASP	$J/\psi \to K^\pm X$

[52] AUBERT 08S reports $[\Gamma(J/\psi(1S) \to K^+ \overline{K}^*(892)^- + \text{c.c.})/\Gamma_{total}] \times [\Gamma(J/\psi(1S) \to e^+ e^-)] = (29.0 \pm 1.7 \pm 1.3) \times 10^{-3}$ keV which we divide by our best value $\Gamma(J/\psi(1S) \to e^+ e^-) = 5.55 \pm 0.14 \pm 0.02$ keV. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(K^+ \overline{K}^*(892)^- + \text{c.c.} \to K^+ K^- \pi^0)/\Gamma_{total}$ $\qquad$ Γ_{23}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
1.97±0.20±0.05	155	[53] AUBERT	08S	BABR	10.6 $e^+ e^- \to K^+ K^- \pi^0 \gamma$

[53] AUBERT 08S reports $[\Gamma(J/\psi(1S) \to K^+ \overline{K}^*(892)^- + \text{c.c.} \to K^+ K^- \pi^0)/\Gamma_{total}] \times [\Gamma(J/\psi(1S) \to e^+ e^-)] = (10.96 \pm 0.85 \pm 0.70) \times 10^{-3}$ keV which we divide by our best value $\Gamma(J/\psi(1S) \to e^+ e^-) = 5.55 \pm 0.14 \pm 0.02$ keV. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(K^+ \overline{K}^*(892)^- + \text{c.c.} \to K^0 K^\pm \pi^\mp)/\Gamma_{total}$ $\qquad$ Γ_{24}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
3.0±0.4±0.1	89	[54] AUBERT	08S	BABR	10.6 $e^+ e^- \to K_S^0 K^\pm \pi^\mp \gamma$

[54] AUBERT 08S reports $[\Gamma(J/\psi(1S) \to K^+ \overline{K}^*(892)^- + \text{c.c.} \to K^0 K^\pm \pi^\mp)/\Gamma_{total}] \times [\Gamma(J/\psi(1S) \to e^+ e^-)] = (16.76 \pm 1.70 \pm 1.00) \times 10^{-3}$ keV which we divide by our best value $\Gamma(J/\psi(1S) \to e^+ e^-) = 5.55 \pm 0.14 \pm 0.02$ keV. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma\left(K^0\overline{K}^*(892)^0 + \text{c.c.}\right)/\Gamma_{\text{total}}$ $\quad\quad\quad \Gamma_{25}/\Gamma$

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
4.39±0.31 OUR AVERAGE					
4.8 ±0.5 ±0.1		[55] AUBERT	08S	BABR	10.6 $e^+e^- \to$ $K^0\overline{K}^*(892)^0\gamma$
3.96±0.15±0.60	1192	JOUSSET	90	DM2	$J/\psi \to$ hadrons
4.33±0.12±0.45		COFFMAN	88	MRK3	$J/\psi \to K^\pm K^0_S \pi^\mp$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
2.7 ±0.6	45	VANNUCCI	77	MRK1	$J/\psi \to K^\pm K^0_S \pi^\mp$

[55] AUBERT 08S reports $[\Gamma(J/\psi(1S) \to K^0\overline{K}^*(892)^0 + \text{c.c.})/\Gamma_{\text{total}}] \times [\Gamma(J/\psi(1S) \to e^+e^-)] = (26.6\pm2.5\pm1.5)\times10^{-3}$ keV which we divide by our best value $\Gamma(J/\psi(1S) \to e^+e^-) = 5.55 \pm 0.14 \pm 0.02$ keV. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma\left(K^0\overline{K}^*(892)^0 + \text{c.c.}\right)/\Gamma\left(K^+\overline{K}^*(892)^- + \text{c.c.}\right)$ $\quad\quad \Gamma_{25}/\Gamma_{22}$

VALUE	DOCUMENT ID		TECN	COMMENT
0.82±0.05±0.09	COFFMAN	88	MRK3	$J/\psi \to K\overline{K}^*(892)$+c.c.

$\Gamma\left(K^0\overline{K}^*(892)^0 + \text{c.c.} \to K^0 K^\pm \pi^\mp\right)/\Gamma_{\text{total}}$ $\quad\quad \Gamma_{26}/\Gamma$

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
3.2±0.4±0.1	94	[56] AUBERT	08S	BABR	10.6 $e^+e^- \to K^0_S K^\pm \pi^\mp \gamma$

[56] AUBERT 08S reports $[\Gamma(J/\psi(1S) \to K^0\overline{K}^*(892)^0 + \text{c.c.} \to K^0 K^\pm \pi^\mp)/\Gamma_{\text{total}}] \times [\Gamma(J/\psi(1S) \to e^+e^-)] = (17.70 \pm 1.70 \pm 1.00) \times 10^{-3}$ keV which we divide by our best value $\Gamma(J/\psi(1S) \to e^+e^-) = 5.55 \pm 0.14 \pm 0.02$ keV. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma\left(K_1(1400)^\pm K^\mp\right)/\Gamma_{\text{total}}$ $\quad\quad\quad \Gamma_{27}/\Gamma$

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
3.8±0.8±1.2	[57] BAI	99C	BES	e^+e^-

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

$\Gamma\left(\overline{K}^*(892)^0 K^+\pi^- + \text{c.c.}\right)/\Gamma_{\text{total}}$ $\quad\quad\quad \Gamma_{28}/\Gamma$

VALUE	DOCUMENT ID		TECN	COMMENT
seen	[58] ABLIKIM	06C	BES2	$J/\psi \to \overline{K}^*(892)^0 K^+\pi^-$

[58] A $K^*_0(800)$ is observed by ABLIKIM 06C in the $K^+\pi^-$ mass spectrum of the $\overline{K}^*(892)^0 K^+\pi^-$ final state against the $\overline{K}^*(892)$. A corresponding branching fraction of the $J/\psi(1S)$ is not presented.

$\Gamma\left(\omega\pi^0\pi^0\right)/\Gamma_{\text{total}}$ $\quad\quad\quad \Gamma_{29}/\Gamma$

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
3.4±0.3±0.7	509	AUGUSTIN	89	DM2	$J/\psi \to \pi^+\pi^- 3\pi^0$

$\Gamma\left(b_1(1235)^\pm \pi^\mp\right)/\Gamma_{\text{total}}$ $\quad\quad\quad \Gamma_{30}/\Gamma$

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
30±5 OUR AVERAGE					
31±6	4600	AUGUSTIN	89	DM2	$J/\psi \to 2(\pi^+\pi^-)\pi^0$
29±7	87	BURMESTER	77D	PLUT	e^+e^-

$\Gamma(\omega K^{\pm} K^0_S \pi^{\mp})/\Gamma_{\text{total}}$ $\qquad$ Γ_{31}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
34 ±5 OUR AVERAGE					
$37.7 \pm 0.8 \pm 5.8$	1972 ± 41	ABLIKIM	08E	BES2	$e^+ e^- \to J/\psi$
$29.5 \pm 1.4 \pm 7.0$	879 ± 41	BECKER	87	MRK3	$e^+ e^- \to$ hadrons

$\Gamma(b_1(1235)^0 \pi^0)/\Gamma_{\text{total}}$ $\qquad$ Γ_{32}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
23±3±5	229	AUGUSTIN	89	DM2	$e^+ e^-$

$\Gamma(\eta K^{\pm} K^0_S \pi^{\mp})/\Gamma_{\text{total}}$ $\qquad$ Γ_{33}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
21.8±2.2±3.4	232 ± 23	ABLIKIM	08E	BES2	$e^+ e^- \to J/\psi$

$\Gamma(\phi K^*(892)\overline{K} + \text{c.c.})/\Gamma_{\text{total}}$ $\qquad$ Γ_{34}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
21.8±2.3 OUR AVERAGE					
$20.8 \pm 2.7 \pm 3.9$	195 ± 25	ABLIKIM	08E	BES2	$J/\psi \to \phi K^0_S K^{\pm} \pi^{\mp}$
$29.6 \pm 3.7 \pm 4.7$	238 ± 30	ABLIKIM	08E	BES2	$J/\psi \to \phi K^+ K^- \pi^0$
$20.7 \pm 2.4 \pm 3.0$		FALVARD	88	DM2	$J/\psi \to$ hadrons
$20 \pm 3 \pm 3$	155 ± 20	BECKER	87	MRK3	$e^+ e^- \to$ hadrons

$\Gamma(\omega K \overline{K})/\Gamma_{\text{total}}$ $\qquad$ Γ_{35}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
(1.6+-0.5) OUR AVERAGE					
$1.36 \pm 0.50 \pm 0.10$	24	[59] AUBERT	07AU	BABR	$10.6\ e^+ e^- \to \omega K^+ K^- \gamma$
$19.8 \pm 2.1 \pm 3.9$		[60] FALVARD	88	DM2	$J/\psi \to$ hadrons
16 ± 10	22	FELDMAN	77	MRK1	$e^+ e^-$

[59] AUBERT 07AU quotes $\Gamma_{ee}^{J/\psi} \cdot B(J/\psi \to \omega K^+ K^-) \cdot B(\eta \to 3\pi) = 3.3 \pm 1.3 \pm 0.2$ eV.
[60] Addition of $\omega K^+ K^-$ and $\omega K^0 \overline{K}^0$ branching ratios.

$\Gamma(\omega f_0(1710) \to \omega K \overline{K})/\Gamma_{\text{total}}$ $\qquad$ Γ_{36}/Γ

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
4.8±1.1±0.3	[61,62] FALVARD	88	DM2	$J/\psi \to$ hadrons

[61] Includes unknown branching fraction $f_0(1710) \to K\overline{K}$.
[62] Addition of $f_0(1710) \to K^+ K^-$ and $f_0(1710) \to K^0 \overline{K}^0$ branching ratios.

$\Gamma(\phi 2(\pi^+ \pi^-))/\Gamma_{\text{total}}$ $\qquad$ Γ_{37}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
16.6±2.3 OUR AVERAGE					
$17.3 \pm 3.3 \pm 1.2$	35	[63] AUBERT	06D	BABR	$10.6\ e^+ e^- \to \phi 2(\pi^+ \pi^-)\gamma$
$16.0 \pm 1.0 \pm 3.0$		FALVARD	88	DM2	$J/\psi \to$ hadrons

[63] Using $\Gamma(J/\psi \to e^+ e^-) = 5.52 \pm 0.14 \pm 0.04$ keV.

$\Gamma(\Delta(1232)^{++} \overline{p} \pi^-)/\Gamma_{\text{total}}$ $\qquad$ Γ_{38}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
1.58±0.23±0.40	332	EATON	84	MRK2	$e^+ e^-$

$\Gamma(\omega\eta)/\Gamma_{total}$ $\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ Γ_{39}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
1.74 ±0.20 OUR AVERAGE		Error includes scale factor of 1.6. See the ideogram below.			
2.352±0.273	5k	[64] ABLIKIM	06F	BES2	$J/\psi \to \omega\eta$
1.44 ±0.40 ±0.14	13	[65] AUBERT	06D	BABR	10.6 $e^+e^- \to \omega\eta\gamma$
1.43 ±0.10 ±0.21	378	JOUSSET	90	DM2	$J/\psi \to$ hadrons
1.71 ±0.08 ±0.20		COFFMAN	88	MRK3	$e^+e^- \to 3\pi\eta$

[64] Using B($\eta \to 2\gamma$) = (39.43 ± 0.26)%, B($\eta \to \pi^+\pi^-\pi^0$) = 22.6 ± 0.4%, B($\eta \to \pi^+\pi^-\gamma$) = 4.68 ± 0.11%, and B($\omega \to \pi^+\pi^-\pi^0$) = (89.1 ± 0.7)%.

[65] Using $\Gamma(J/\psi \to e^+e^-)$ = $5.52 \pm 0.14 \pm 0.04$ keV.

WEIGHTED AVERAGE
1.74±0.20 (Error scaled by 1.6)

			χ^2
ABLIKIM	06F	BES2	5.0
AUBERT	06D	BABR	0.5
JOUSSET	90	DM2	1.8
COFFMAN	88	MRK3	0.0
			7.3

(Confidence Level = 0.062)

$\Gamma(\omega\eta)/\Gamma_{total}$ (units 10^{-3})

$\Gamma(\phi K\overline{K})/\Gamma_{total}$ $\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ Γ_{40}/Γ

VALUE (units 10^{-4})	EVTS		DOCUMENT ID		TECN	COMMENT
18.3± 2.4 OUR AVERAGE			Error includes scale factor of 1.5. See the ideogram below.			
21.4± 0.4±2.2			ABLIKIM	05	BES2	$J/\psi \to \phi\pi^+\pi^-$
48 $^{+20}_{-16}$ ±6	9.0$^{+3.7}_{-3.0}$	[66,67]	HUANG	03	BELL	$B^+ \to (\phi K^+ K^-) K^+$
14.6± 0.8±2.1		[68]	FALVARD	88	DM2	$J/\psi \to$ hadrons
18 ± 8	14		FELDMAN	77	MRK1	e^+e^-

[66] We have multiplied K^+K^- measurement by 2 to obtain $K\overline{K}$.

[67] Using B($B^+ \to J/\psi K^+$) = $(1.01 \pm 0.05) \times 10^{-3}$.

[68] Addition of ϕK^+K^- and $\phi K^0\overline{K}^0$ branching ratios.

WEIGHTED AVERAGE
18.3±2.4 (Error scaled by 1.5)

			χ^2
ABLIKIM	05	BES2	2.0
HUANG	03	BELL	
FALVARD	88	DM2	2.7
FELDMAN	77	MRK1	0.0
			4.6

(Confidence Level = 0.099)

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

$\Gamma(\phi f_0(1710) \to \phi K \overline{K})/\Gamma_{\text{total}}$ $\qquad$ Γ_{41}/Γ

VALUE (units 10^{-4})		DOCUMENT ID		TECN	COMMENT
3.6±0.2±0.6		[69,70] FALVARD	88	DM2	$J/\psi \to$ hadrons

[69] Including interference with $f_2'(1525)$.

[70] Includes unknown branching fraction $f_0(1710) \to K \overline{K}$.

$\Gamma(\phi f_2(1270))/\Gamma_{\text{total}}$ $\qquad$ Γ_{42}/Γ

VALUE (units 10^{-3})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
0.72±0.13±0.02		44 ± 7	[71,72] AUBERT	07AK	BABR	$10.6\ e^+ e^- \to$ $\pi^+ \pi^- K^+ K^- \gamma$

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

< 0.45	90		FALVARD	88	DM2	$J/\psi \to$ hadrons
< 0.37	90		VANNUCCI	77	MRK1	$e^+ e^- \to$ $\pi^+ \pi^- K^+ K^-$

[71] Using B($f_2(1270) \to \pi\pi$) = $(84.8^{+2.4}_{-1.2})$%

[72] AUBERT 07AK reports $[\Gamma(J/\psi(1S) \to \phi f_2(1270))/\Gamma_{\text{total}}] \times [\Gamma(J/\psi(1S) \to e^+ e^-)]$ = $(4.02 \pm 0.65 \pm 0.33) \times 10^{-3}$ keV which we divide by our best value $\Gamma(J/\psi(1S) \to e^+ e^-)$ = $5.55 \pm 0.14 \pm 0.02$ keV. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\Delta(1232)^{++}\overline{\Delta}(1232)^{--})/\Gamma_{\text{total}}$ $\qquad$ Γ_{43}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
1.10±0.09±0.28	233	EATON	84	MRK2	$e^+ e^-$

$\Gamma\left(\Sigma(1385)^{-}\,\overline{\Sigma}(1385)^{+}\,(\text{or c.c.})\right)/\Gamma_{total}$ $\qquad$ Γ_{44}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
1.03±0.13 OUR AVERAGE					
1.00±0.04±0.21	631 ± 25	HENRARD	87	DM2	$e^+e^- \to \Sigma^{*-}$
1.19±0.04±0.25	754 ± 27	HENRARD	87	DM2	$e^+e^- \to \Sigma^{*+}$
0.86±0.18±0.22	56	EATON	84	MRK2	$e^+e^- \to \Sigma^{*-}$
1.03±0.24±0.25	68	EATON	84	MRK2	$e^+e^- \to \Sigma^{*+}$

$\Gamma\left(\phi f_2'(1525)\right)/\Gamma_{total}$ $\qquad$ Γ_{45}/Γ

VALUE (units 10^{-4})	EVTS		DOCUMENT ID		TECN	COMMENT
(8+–4) OUR AVERAGE	Error includes scale factor of 2.7.					
12.3±0.6±2.0		[73,74]	FALVARD	88	DM2	$J/\psi \to$ hadrons
4.8±1.8	46	[73]	GIDAL	81	MRK2	$J/\psi \to K^+K^-K^+K^-$

[73] Re-evaluated using $B(f_2'(1525) \to K\overline{K}) = 0.713$.

[74] Including interference with $f_0(1710)$.

$\Gamma\left(\phi\pi^+\pi^-\right)/\Gamma_{total}$ $\qquad$ Γ_{46}/Γ

VALUE (units 10^{-3})	EVTS		DOCUMENT ID		TECN	COMMENT
0.94±0.09 OUR AVERAGE	Error includes scale factor of 1.2.					
0.96±0.13	103	[75]	AUBERT,BE	06D	BABR	10.6 $e^+e^- \to K^+K^-\pi^+\pi^-\gamma$
1.09±0.02±0.13			ABLIKIM	05	BES2	$J/\psi \to \phi\pi^+\pi^-$
0.78±0.03±0.12			FALVARD	88	DM2	$J/\psi \to$ hadrons
2.1 ±0.9	23		FELDMAN	77	MRK1	e^+e^-

[75] Derived by us. AUBERT,BE 06D measures $\Gamma(J/\psi \to e^+e^-) \times B(J/\psi \to \phi\pi^+\pi^-) \times B(\phi \to K^+K^-) = (2.61 \pm 0.30 \pm 0.18)$ eV

$\Gamma\left(\phi\pi^0\pi^0\right)/\Gamma_{total}$ $\qquad$ Γ_{47}/Γ

VALUE (units 10^{-3})	EVTS		DOCUMENT ID		TECN	COMMENT
0.56±0.16	23	[76]	AUBERT,BE	06D	BABR	10.6 $e^+e^- \to K^+K^-\pi^0\pi^0\gamma$

[76] Derived by us. AUBERT,BE 06D measures $\Gamma(J/\psi \to e^+e^-) \times B(J/\psi \to \phi\pi^0\pi^0) \times B(\phi \to K^+K^-) = (1.54 \pm 0.40 \pm 0.16)$ eV

$\Gamma\left(\phi K^{\pm} K_S^0 \pi^{\mp}\right)/\Gamma_{total}$ $\qquad$ Γ_{48}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
(7.2+–0.8) OUR AVERAGE					
7.4±0.6±1.4	227 ± 19	ABLIKIM	08E	BES2	$e^+e^- \to J/\psi$
7.4±0.9±1.1		FALVARD	88	DM2	$J/\psi \to$ hadrons
7 ±0.6±1.0	163 ± 15	BECKER	87	MRK3	$e^+e^- \to$ hadrons

$\Gamma\left(\omega f_1(1420)\right)/\Gamma_{total}$ $\qquad$ Γ_{49}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
6.8$^{+1.9}_{-1.6}$±1.7	111$^{+31}_{-26}$	BECKER	87	MRK3	$e^+e^- \to$ hadrons

$\Gamma(\phi\eta)/\Gamma_{total}$ $\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ Γ_{50}/Γ

VALUE (units 10^{-3})	EVTS		DOCUMENT ID		TECN	COMMENT
0.75 ±0.08 OUR AVERAGE			Error includes scale factor of 1.5. See the ideogram below.			
1.4 ±0.6 ±0.1	6	[77]	AUBERT	07AU	BABR	10.6 $e^+ e^- \to \phi\eta\gamma$
0.898±0.024±0.089			ABLIKIM	05B	BES2	$e^+ e^- \to J/\psi \to$ hadr
0.64 ±0.04 ±0.11	346		JOUSSET	90	DM2	$J/\psi \to$ hadrons
0.661±0.045±0.078			COFFMAN	88	MRK3	$e^+ e^- \to K^+ K^- \eta$

[77] AUBERT 07AU quotes $\Gamma_{ee}^{J/\psi} \cdot B(J/\psi \to \phi\eta) \cdot B(\phi \to K^+ K^-) \cdot B(\eta \to \gamma\gamma) = 0.84 \pm 0.37 \pm 0.05$ eV.

WEIGHTED AVERAGE
0.75±0.08 (Error scaled by 1.5)

		χ^2
AUBERT	07AU BABR	
ABLIKIM	05B BES2	2.6
JOUSSET	90 DM2	0.9
COFFMAN	88 MRK3	1.0
		4.4

(Confidence Level = 0.109)

0   0.5   1   1.5   2

$\Gamma(\phi\eta)/\Gamma_{total}$ (units 10^{-3})

$\Gamma(\Xi^0 \overline{\Xi}^0)/\Gamma_{total}$ $\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ Γ_{51}/Γ
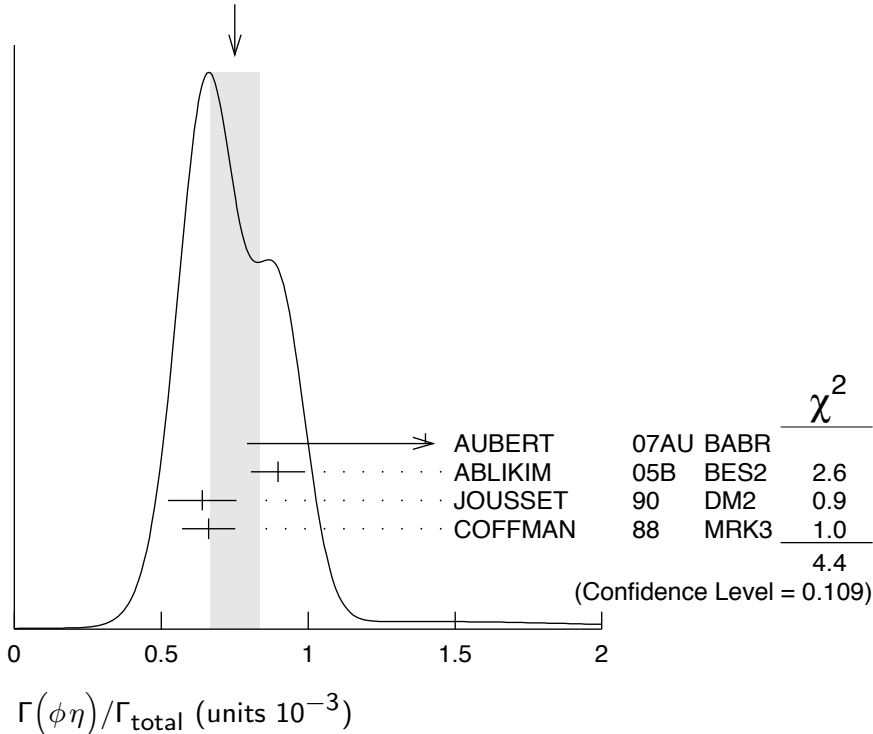
VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
1.20±0.12±0.21	206	ABLIKIM	08O	BES2	$e^+ e^- \to J/\psi$

$\Gamma(\Xi(1530)^- \overline{\Xi}^+)/\Gamma_{total}$ $\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ Γ_{52}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
0.59±0.09±0.12	75 ± 11	HENRARD	87	DM2	$e^+ e^-$

$\Gamma(p K^- \overline{\Sigma}(1385)^0)/\Gamma_{total}$ $\qquad\qquad\qquad\qquad\qquad\qquad$ Γ_{53}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
0.51±0.26±0.18	89	EATON	84	MRK2	$e^+ e^-$

$\Gamma(\omega\pi^0)/\Gamma_{\text{total}}$ $\qquad\qquad$ Γ_{54}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
0.45 ±0.05 OUR AVERAGE		Error includes scale factor of 1.4. See the ideogram below.			
$0.538\pm0.012\pm0.065$	2090	[78] ABLIKIM	06F	BES2	$J/\psi \to \omega\pi^0$
$0.360\pm0.028\pm0.054$	222	JOUSSET	90	DM2	$J/\psi \to$ hadrons
$0.482\pm0.019\pm0.064$		COFFMAN	88	MRK3	$e^+e^- \to \pi^0\pi^+\pi^-\pi^0$

[78] Using B$(\omega \to \pi^+\pi^-\pi^0) = (89.1 \pm 0.7)\%$.

WEIGHTED AVERAGE
0.45±0.05 (Error scaled by 1.4)

			χ^2
ABLIKIM	06F	BES2	1.6
JOUSSET	90	DM2	2.4
COFFMAN	88	MRK3	0.2
			4.2

(Confidence Level = 0.124)

$\Gamma(\omega\pi^0)/\Gamma_{\text{total}}$ (units 10^{-3})

$\Gamma(\phi\eta'(958))/\Gamma_{\text{total}}$ $\qquad\qquad$ Γ_{55}/Γ
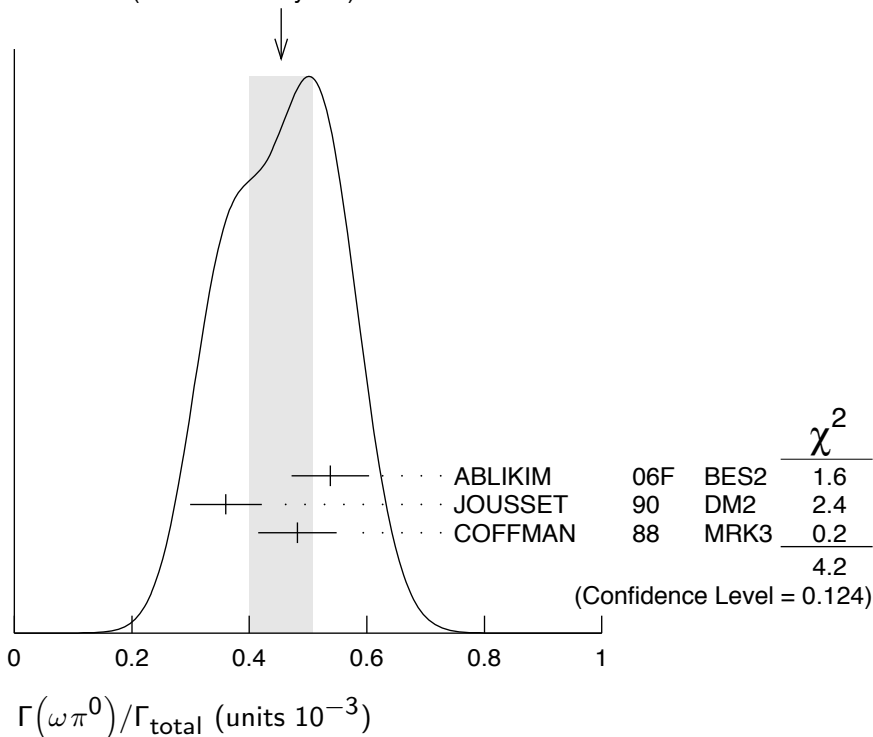
VALUE (units 10^{-3})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
0.40 ±0.07 OUR AVERAGE			Error includes scale factor of 2.1. See the ideogram below.			
$0.546\pm0.031\pm0.056$			ABLIKIM	05B	BES2	$e^+e^- \to J/\psi \to$ hadr
$0.41 \pm0.03 \pm0.08$		167	JOUSSET	90	DM2	$J/\psi \to$ hadrons
$0.308\pm0.034\pm0.036$			COFFMAN	88	MRK3	$e^+e^- \to K^+K^-\eta'$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
< 1.3	90		VANNUCCI	77	MRK1	e^+e^-

WEIGHTED AVERAGE
0.40±0.07 (Error scaled by 2.1)

			χ^2
ABLIKIM	05B	BES2	5.2
JOUSSET	90	DM2	0.0
COFFMAN	88	MRK3	3.4
			8.7

(Confidence Level = 0.013)

$\Gamma\big(\phi\eta'(958)\big)/\Gamma_{total}$ (units 10^{-3})
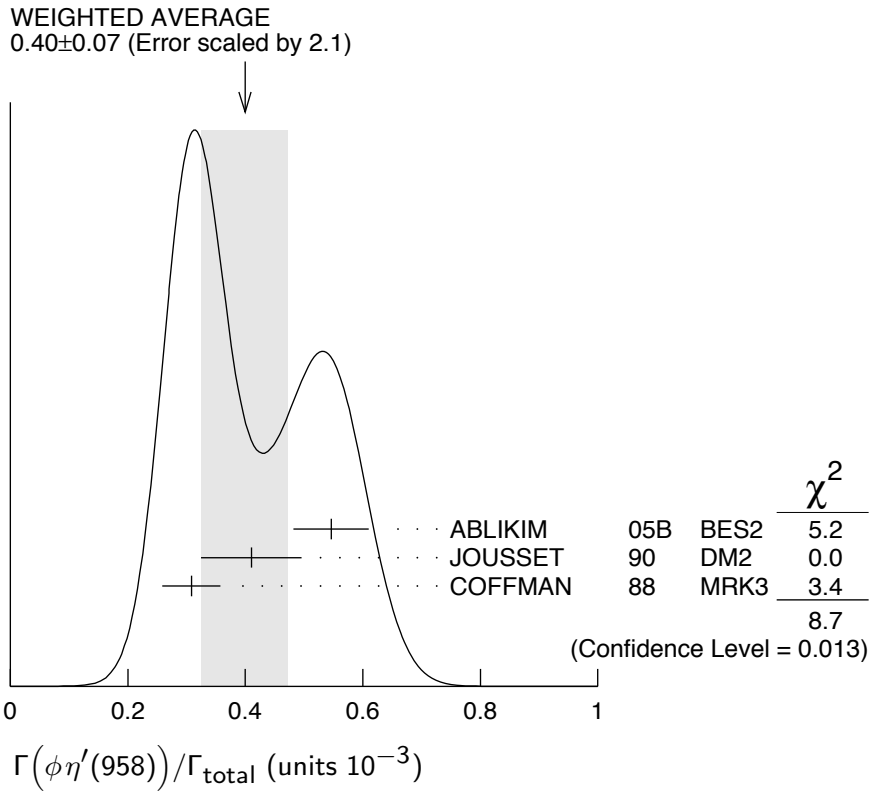
$\Gamma\big(\phi f_0(980)\big)/\Gamma_{total}$ $\qquad\qquad$ Γ_{56}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
(3.2+-0.9) OUR AVERAGE	Error includes scale factor of 1.9.				
4.6±0.4±0.8		[79] FALVARD	88	DM2	$J/\psi \to$ hadrons
2.6±0.6	50	[79] GIDAL	81	MRK2	$J/\psi \to K^+ K^- K^+ K^-$

[79] Assuming B($f_0(980) \to \pi\pi$) = 0.78.

$\Gamma\big(\phi f_0(980) \to \phi\pi^+\pi^-\big)/\Gamma_{total}$ $\qquad\qquad$ Γ_{57}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
0.182±0.042±0.005	19.5 ± 4.5	[80,81] AUBERT	07AK	BABR	$10.6\ e^+ e^- \to$ $\pi^+\pi^- K^+ K^- \gamma$

[80] Using B($\phi \to K^+ K^-$) = (49.3 ± 0.6)%.
[81] AUBERT 07AK reports $[\Gamma\big(J/\psi(1S) \to \phi f_0(980) \to \phi\pi^+\pi^-\big)/\Gamma_{total}] \times [\Gamma\big(J/\psi(1S) \to e^+ e^-\big)] = (1.01 \pm 0.22 \pm 0.08) \times 10^{-3}$ keV which we divide by our best value $\Gamma\big(J/\psi(1S) \to e^+ e^-\big) = 5.55 \pm 0.14 \pm 0.02$ keV. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma\big(\phi f_0(980) \to \phi\pi^0\pi^0\big)/\Gamma_{total}$ $\qquad\qquad$ Γ_{58}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
0.171±0.073±0.004	7.0 ± 2.8	[82,83] AUBERT	07AK	BABR	$10.6\ e^+ e^- \to$ $\pi^0\pi^0 K^+ K^- \gamma$

[82] Using B($\phi \to K^+ K^-$) = (49.3 ± 0.6)%.
[83] AUBERT 07AK reports $[\Gamma\big(J/\psi(1S) \to \phi f_0(980) \to \phi\pi^0\pi^0\big)/\Gamma_{total}] \times [\Gamma\big(J/\psi(1S) \to e^+ e^-\big)] = (0.95 \pm 0.39 \pm 0.10) \times 10^{-3}$ keV which we divide by our best value $\Gamma\big(J/\psi(1S) \to e^+ e^-\big) = 5.55 \pm 0.14 \pm 0.02$ keV. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma\left(\eta\phi f_0(980) \to \eta\phi\pi^+\pi^-\right)/\Gamma_{\text{total}}$ $\qquad$ Γ_{59}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
3.23±0.75±0.73	52	ABLIKIM	08F	BES	$J/\psi \to \eta\phi f_0(980)$

$\Gamma\left(\Xi(1530)^0 \overline{\Xi}^0\right)/\Gamma_{\text{total}}$ $\qquad$ Γ_{60}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
0.32±0.12±0.07	24 ± 9	HENRARD	87	DM2	e^+e^-

$\Gamma\left(\Sigma(1385)^- \overline{\Sigma}^+ (\text{or c.c.})\right)/\Gamma_{\text{total}}$ $\qquad$ Γ_{61}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
0.31±0.05 OUR AVERAGE					
0.30±0.03±0.07	74 ± 8	HENRARD	87	DM2	$e^+e^- \to \Sigma^{*-}$
0.34±0.04±0.07	77 ± 9	HENRARD	87	DM2	$e^+e^- \to \Sigma^{*+}$
0.29±0.11±0.10	26	EATON	84	MRK2	$e^+e^- \to \Sigma^{*-}$
0.31±0.11±0.11	28	EATON	84	MRK2	$e^+e^- \to \Sigma^{*+}$

$\Gamma\left(\phi f_1(1285)\right)/\Gamma_{\text{total}}$ $\qquad$ Γ_{62}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
(2.6+−0.5) OUR AVERAGE	Error includes scale factor of 1.1.				
3.2±0.6±0.4		JOUSSET	90	DM2	$J/\psi \to \phi 2(\pi^+\pi^-)$
2.1±0.5±0.4	25	[84] JOUSSET	90	DM2	$J/\psi \to \phi\eta\pi^+\pi^-$

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

0.6±0.2±0.1	16 ± 6	BECKER	87	MRK3	$J/\psi \to \phi K\overline{K}\pi$

[84] We attribute to the $f_1(1285)$ the signal observed in the $\pi^+\pi^-\eta$ invariant mass distribution at 1297 MeV.

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

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
0.40±0.17±0.03	9	[85] AUBERT	07AU	BABR	$10.6\ e^+e^- \to \eta\pi^+\pi^-\gamma$

[85] AUBERT 07AU quotes $\Gamma_{ee}^{J/\psi} \cdot B(J/\psi \to \eta\pi^+\pi^-) \cdot B(\eta \to 3\pi) = 0.51 \pm 0.22 \pm 0.03$ eV.

$\Gamma\left(\rho\eta\right)/\Gamma_{\text{total}}$ $\qquad$ Γ_{64}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
0.193±0.023 OUR AVERAGE					
0.194±0.017±0.029	299	JOUSSET	90	DM2	$J/\psi \to$ hadrons
0.193±0.013±0.029		COFFMAN	88	MRK3	$e^+e^- \to \pi^+\pi^-\eta$

$\Gamma\left(\omega\eta'(958)\right)/\Gamma_{\text{total}}$ $\qquad$ Γ_{65}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
0.182±0.021 OUR AVERAGE					
0.226±0.043	218	[86] ABLIKIM	06F	BES2	$J/\psi \to \omega\eta'$
0.18 $^{+0.10}_{-0.08}$ ±0.03	6	JOUSSET	90	DM2	$J/\psi \to$ hadrons
0.166±0.017±0.019		COFFMAN	88	MRK3	$e^+e^- \to 3\pi\eta'$

[86] Using $B(\eta' \to \pi^+\pi^-\eta) = (44.3 \pm 1.5)\%$, $B(\eta' \to \pi^+\pi^-\gamma) = 29.5 \pm 1.0\%$, $B(\eta \to 2\gamma) = 39.43 \pm 0.26\%$, and $B(\omega \to \pi^+\pi^-\pi^0) = (89.1 \pm 0.7)\%$.

$\Gamma\left(\omega\, f_0(980)\right)/\Gamma_{total}$ — Γ_{66}/Γ

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
1.41±0.27±0.47	[87] AUGUSTIN	89	DM2	$J/\psi \to 2(\pi^+\pi^-)\pi^0$

[87] Assuming B($f_0(980) \to \pi\pi$) = 0.78.

$\Gamma\left(\rho\,\eta'(958)\right)/\Gamma_{total}$ — Γ_{67}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
0.105±0.018 OUR AVERAGE					
0.083±0.030±0.012	19	JOUSSET	90	DM2	$J/\psi \to$ hadrons
0.114±0.014±0.016		COFFMAN	88	MRK3	$J/\psi \to \pi^+\pi^-\eta'$

$\Gamma\left(a_2(1320)^\pm\,\pi^\mp\right)/\Gamma_{total}$ — Γ_{68}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<43	90	BRAUNSCH...	76	DASP	e^+e^-

$\Gamma\left(K\,\overline{K}_2^*(1430) + c.c.\right)/\Gamma_{total}$ — Γ_{69}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<40	90	VANNUCCI	77	MRK1	$e^+e^- \to K^0\overline{K}_2^{*0}$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<66	90	BRAUNSCH...	76	DASP	$e^+e^- \to K^\pm\overline{K}_2^{*\mp}$

$\Gamma\left(K_1(1270)^\pm\,K^\mp\right)/\Gamma_{total}$ — Γ_{70}/Γ

VALUE (units 10^{-3})	CL%	DOCUMENT ID		TECN	COMMENT
<3.0	90	[88] BAI	99C	BES	e^+e^-

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

$\Gamma\left(K_2^*(1430)^0\,\overline{K}_2^*(1430)^0\right)/\Gamma_{total}$ — Γ_{71}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<29	90	VANNUCCI	77	MRK1	$e^+e^- \to \pi^+\pi^- K^+K^-$

$\Gamma\left(\phi\,\pi^0\right)/\Gamma_{total}$ — Γ_{72}/Γ

VALUE (units 10^{-6})	CL%	DOCUMENT ID		TECN	COMMENT
<6.4	90	ABLIKIM	05B	BES2	$e^+e^- \to J/\psi \to \phi\gamma\gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<6.8	90	COFFMAN	88	MRK3	$e^+e^- \to K^+K^-\pi^0$

$\Gamma\left(\phi\,\eta(1405) \to \phi\,\eta\pi\pi\right)/\Gamma_{total}$ — Γ_{73}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<2.5	90	[89] FALVARD	88	DM2	$J/\psi \to$ hadrons

[89] Includes unknown branching fraction $\eta(1405) \to \eta\pi\pi$.

$\Gamma\left(\omega f_2'(1525)\right)/\Gamma_{total}$ $\qquad$ Γ_{74}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<2.2	90	[90] VANNUCCI	77	MRK1	$e^+e^- \to \pi^+\pi^-\pi^0 K^+K^-$

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

<2.8	90	[90] FALVARD	88	DM2	$J/\psi \to$ hadrons

[90] Re-evaluated assuming $B(f_2'(1525) \to K\overline{K}) = 0.713$.

$\Gamma\left(\eta\phi(2170) \to \eta K^*(892)^0 \overline{K}^*(892)^0\right)/\Gamma_{total}$ $\qquad$ Γ_{75}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<2.52	90	ABLIKIM	10C	BES2	$J/\psi \to \eta K^+\pi^- K^-\pi^+$

$\Gamma\left(\Sigma(1385)^0\overline{\Lambda}\right)/\Gamma_{total}$ $\qquad$ Γ_{76}/Γ

VALUE (units 10^{-3})	CL%	DOCUMENT ID		TECN	COMMENT
<0.2	90	HENRARD	87	DM2	e^+e^-

$\Gamma\left(\Delta(1232)^+\overline{p}\right)/\Gamma_{total}$ $\qquad$ Γ_{77}/Γ

VALUE (units 10^{-3})	CL%	DOCUMENT ID		TECN	COMMENT
<0.1	90	HENRARD	87	DM2	e^+e^-

$\Gamma\left(\Theta(1540)\overline{\Theta}(1540) \to K_S^0 p K^-\overline{n} + \text{c.c.}\right)/\Gamma_{total}$ $\qquad$ Γ_{78}/Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID		TECN	COMMENT
<1.1	90	BAI	04G	BES2	e^+e^-

$\Gamma\left(\Theta(1540)K^-\overline{n} \to K_S^0 p K^-\overline{n}\right)/\Gamma_{total}$ $\qquad$ Γ_{79}/Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID		TECN	COMMENT
<2.1	90	BAI	04G	BES2	e^+e^-

$\Gamma\left(\Theta(1540)K_S^0\overline{p} \to K_S^0\overline{p}K^+ n\right)/\Gamma_{total}$ $\qquad$ Γ_{80}/Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID		TECN	COMMENT
<1.6	90	BAI	04G	BES2	e^+e^-

$\Gamma\left(\overline{\Theta}(1540)K^+ n \to K_S^0\overline{p}K^+ n\right)/\Gamma_{total}$ $\qquad$ Γ_{81}/Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID		TECN	COMMENT
<5.6	90	BAI	04G	BES2	e^+e^-

$\Gamma\left(\overline{\Theta}(1540)K_S^0 p \to K_S^0 p K^-\overline{n}\right)/\Gamma_{total}$ $\qquad$ Γ_{82}/Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID		TECN	COMMENT
<1.1	90	BAI	04G	BES2	e^+e^-

$\Gamma\left(\Sigma^0\overline{\Lambda}\right)/\Gamma_{total}$ $\qquad$ Γ_{83}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<0.9	90	HENRARD	87	DM2	e^+e^-

———— STABLE HADRONS ————

$\Gamma(2(\pi^+\pi^-)\pi^0)/\Gamma_{\text{total}}$ $\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad$ Γ_{84}/Γ

VALUE (units 10^{-2})	EVTS		DOCUMENT ID		TECN	COMMENT
4.1 ±0.5 OUR AVERAGE			Error includes scale factor of 2.4. See the ideogram below.			
$5.46\pm0.34\pm0.14$	4990	[91]	AUBERT	07AU	BABR	10.6 $e^+e^- \to 2(\pi^+\pi^-)\pi^0\gamma$
3.25 ± 0.49	46055		AUGUSTIN	89	DM2	$J/\psi \to 2(\pi^+\pi^-)\pi^0$
3.17 ± 0.42	147		FRANKLIN	83	MRK2	$e^+e^- \to$ hadrons
3.64 ± 0.52	1500		BURMESTER	77D	PLUT	e^+e^-
$4\ \ \pm1$	675		JEAN-MARIE	76	MRK1	e^+e^-

[91] AUBERT 07AU reports $[\Gamma(J/\psi(1S) \to 2(\pi^+\pi^-)\pi^0)/\Gamma_{\text{total}}] \times [\Gamma(J/\psi(1S) \to e^+e^-)] = 0.303 \pm 0.005 \pm 0.018$ keV which we divide by our best value $\Gamma(J/\psi(1S) \to e^+e^-) = 5.55 \pm 0.14 \pm 0.02$ keV. Our first error is their experiment's error and our second error is the systematic error from using our best value.

WEIGHTED AVERAGE
4.1±0.5 (Error scaled by 2.4)

			χ^2
AUBERT	07AU	BABR	14.3
AUGUSTIN	89	DM2	2.9
FRANKLIN	83	MRK2	4.7
BURMESTER	77D	PLUT	0.7
JEAN-MARIE	76	MRK1	0.0
			22.6

(Confidence Level = 0.0002)

$\Gamma(2(\pi^+\pi^-)\pi^0)/\Gamma_{\text{total}}$ (units 10^{-2})
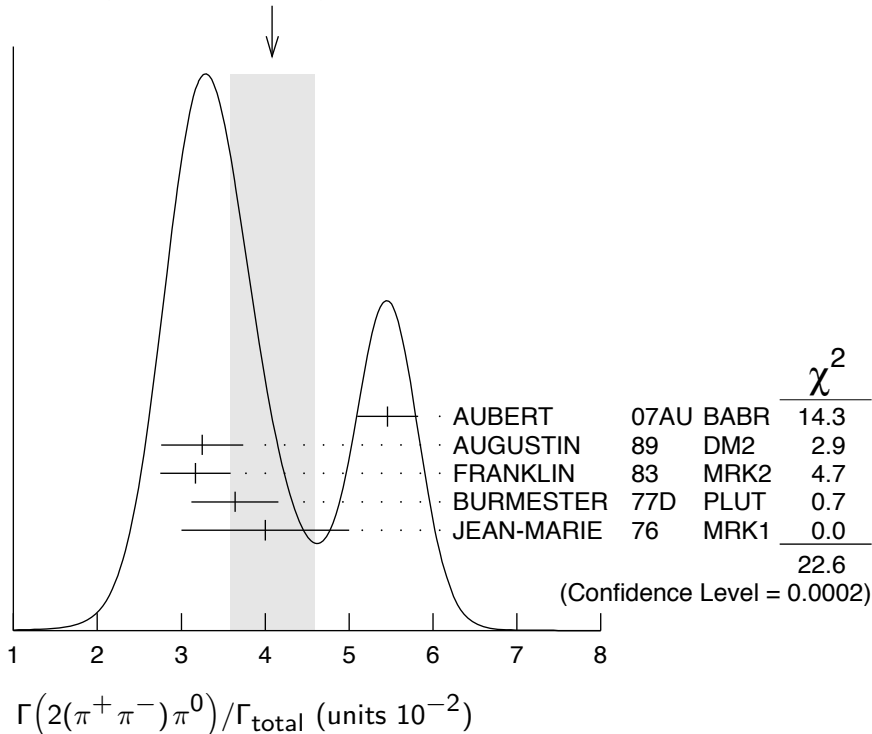
$\Gamma(\omega\pi^+\pi^-)/\Gamma(2(\pi^+\pi^-)\pi^0)$ $\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\quad$ Γ_{13}/Γ_{84}

VALUE		DOCUMENT ID		TECN	COMMENT
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●					
0.3	[92]	JEAN-MARIE	76	MRK1	e^+e^-

[92] Final state $(\pi^+\pi^-)\pi^0$ under the assumption that $\pi\pi$ is isospin 0.

$\Gamma\left(3(\pi^+\pi^-)\pi^0\right)/\Gamma_{\text{total}}$ $\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ Γ_{85}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.029±0.006 OUR AVERAGE					
0.028±0.009	11	FRANKLIN	83	MRK2	$e^+e^- \to$ hadrons
0.029±0.007	181	JEAN-MARIE	76	MRK1	e^+e^-

$\Gamma\left(\pi^+\pi^-\pi^0\right)/\Gamma_{\text{total}}$ $\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ Γ_{86}/Γ

VALUE (units 10^{-3})	EVTS		DOCUMENT ID		TECN	COMMENT
20.7 ±1.2 OUR AVERAGE			Error includes scale factor of 1.6. See the ideogram below.			
23.6 ±2.1 ±0.5	256	[93]	AUBERT	07AU	BABR	10.6 $e^+e^- \to J/\psi\,\pi^+\pi^-\gamma$
21.8 ±1.9		[94,95]	AUBERT,B	04N	BABR	10.6 $e^+e^- \to \pi^+\pi^-\pi^0\gamma$
21.84±0.05±2.01	220k	[95,96]	BAI	04H	BES	e^+e^-
20.91±0.21±1.16		[95,97]	BAI	04H	BES	e^+e^-
15 ±2	168		FRANKLIN	83	MRK2	e^+e^-

[93] AUBERT 07AU reports $[\Gamma(J/\psi(1S) \to \pi^+\pi^-\pi^0)/\Gamma_{\text{total}}] \times [\Gamma(\psi(2S) \to J/\psi(1S)\pi^+\pi^-) \times \Gamma(\psi(2S) \to e^+e^-)/\Gamma_{\text{total}}] = (18.6\pm1.2\pm1.1)\times10^{-3}$ keV which we divide by our best value $\Gamma(\psi(2S) \to J/\psi(1S)\pi^+\pi^-) \times \Gamma(\psi(2S) \to e^+e^-)/\Gamma_{\text{total}} = 0.789 \pm 0.015$ keV. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[94] From the ratio of $\Gamma(e^+e^-)\,B(\pi^+\pi^-\pi^0)$ and $\Gamma(e^+e^-)\,B(\mu^+\mu^-)$ (AUBERT 04).

[95] Mostly $\rho\pi$, see also $\rho\pi$ subsection.

[96] From $J/\psi \to \pi^+\pi^-\pi^0$ events directly.

[97] Obtained comparing the rates for $\pi^+\pi^-\pi^0$ and $\mu^+\mu^-$, using J/ψ events produced via $\psi(2S) \to \pi^+\pi^- J/\psi$ and with $B(J/\psi \to \mu^+\mu^-) = 5.88 \pm 0.10\%$.

WEIGHTED AVERAGE
20.7±1.2 (Error scaled by 1.6)

			χ^2
AUBERT	07AU	BABR	1.9
AUBERT,B	04N	BABR	0.3
BAI	04H	BES	0.3
BAI	04H	BES	0.0
FRANKLIN	83	MRK2	8.1
			10.7
(Confidence Level = 0.031)			

$\Gamma\left(\pi^+\pi^-\pi^0\right)/\Gamma_{\text{total}}$ (units 10^{-3})

$\Gamma(\pi^+\pi^-\pi^0 K^+ K^-)/\Gamma_{total}$ $\qquad\qquad$ Γ_{87}/Γ
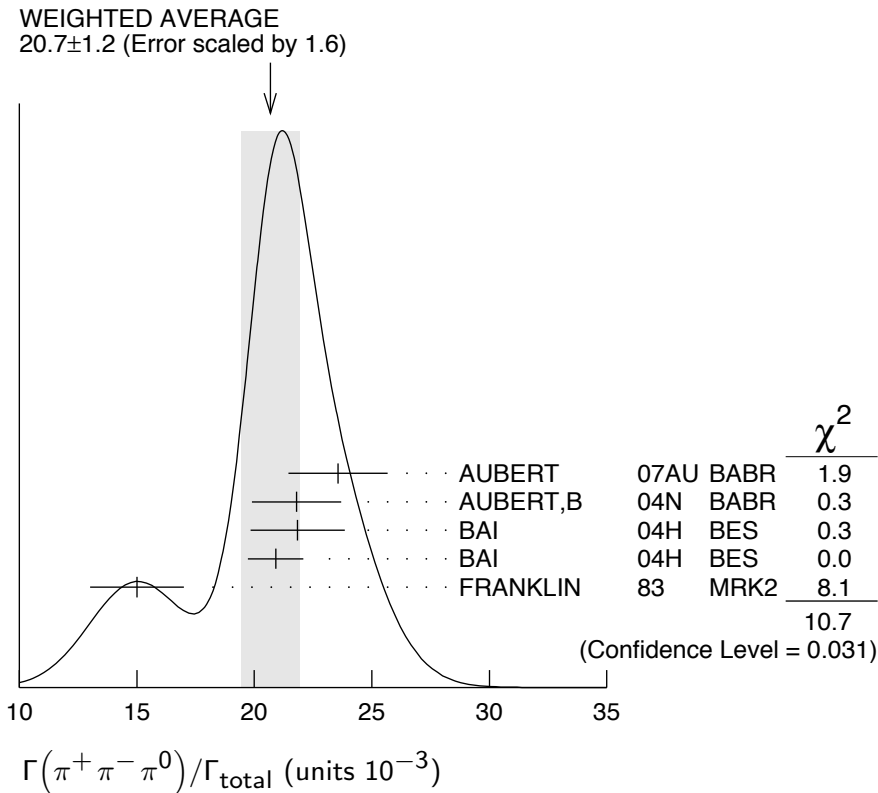
VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
1.79±0.29 OUR AVERAGE		Error includes scale factor of 2.2.			
1.93±0.14±0.05	768	[98] AUBERT		07AU BABR	$10.6\ e^+e^- \rightarrow$ $K^+K^-\pi^+\pi^-\pi^0\gamma$
1.2 ±0.3	309	VANNUCCI	77	MRK1	e^+e^-

[98] AUBERT 07AU reports $[\Gamma(J/\psi(1S) \rightarrow \pi^+\pi^-\pi^0 K^+K^-)/\Gamma_{total}] \times [\Gamma(J/\psi(1S) \rightarrow e^+e^-)] = 0.1070 \pm 0.0043 \pm 0.0064$ keV which we divide by our best value $\Gamma(J/\psi(1S) \rightarrow e^+e^-) = 5.55 \pm 0.14 \pm 0.02$ keV. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(4(\pi^+\pi^-)\pi^0)/\Gamma_{total}$ $\qquad\qquad$ Γ_{88}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
90±30	13	JEAN-MARIE 76	MRK1	e^+e^-

$\Gamma(\pi^+\pi^- K^+ K^-)/\Gamma_{total}$ $\qquad\qquad$ Γ_{89}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
6.6±0.5 OUR AVERAGE					
6.5±0.4±0.2	1.6k	[99] AUBERT	07AK BABR		$10.6\ e^+e^- \rightarrow \pi^+\pi^- K^+K^-\gamma$
7.2±2.3	205	VANNUCCI	77 MRK1		e^+e^-
• • • We do not use the following data for averages, fits, limits, etc. • • •					
6.1±0.7±0.2	233	[100] AUBERT	05D BABR		$10.6\ e^+e^- \rightarrow K^+K^-\pi^+\pi^-\gamma$

[99] AUBERT 07AK reports $[\Gamma(J/\psi(1S) \rightarrow \pi^+\pi^- K^+K^-)/\Gamma_{total}] \times [\Gamma(J/\psi(1S) \rightarrow e^+e^-)] = (36.3 \pm 1.3 \pm 2.1) \times 10^{-3}$ keV which we divide by our best value $\Gamma(J/\psi(1S) \rightarrow e^+e^-) = 5.55 \pm 0.14 \pm 0.02$ keV. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[100] Superseded by AUBERT 07AK. AUBERT 05D reports $[\Gamma(J/\psi(1S) \rightarrow \pi^+\pi^- K^+K^-)/\Gamma_{total}] \times [\Gamma(J/\psi(1S) \rightarrow e^+e^-)] = (33.6 \pm 2.7 \pm 2.7) \times 10^{-3}$ keV which we divide by our best value $\Gamma(J/\psi(1S) \rightarrow e^+e^-) = 5.55 \pm 0.14 \pm 0.02$ keV. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\pi^+\pi^- K^+ K^- \eta)/\Gamma_{total}$ $\qquad\qquad$ Γ_{90}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
1.84±0.28±0.05	73	[101] AUBERT	07AU BABR		$10.6\ e^+e^- \rightarrow$ $K^+K^-\pi^+\pi^-\eta\gamma$

[101] AUBERT 07AU reports $[\Gamma(J/\psi(1S) \rightarrow \pi^+\pi^- K^+K^-\eta)/\Gamma_{total}] \times [\Gamma(J/\psi(1S) \rightarrow e^+e^-)] = (10.2 \pm 1.3 \pm 0.8) \times 10^{-3}$ keV which we divide by our best value $\Gamma(J/\psi(1S) \rightarrow e^+e^-) = 5.55 \pm 0.14 \pm 0.02$ keV. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\pi^0\pi^0 K^+ K^-)/\Gamma_{total}$ $\qquad\qquad$ Γ_{91}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
2.45±0.31±0.06	203 ± 16	[102] AUBERT	07AK BABR		$10.6\ e^+e^- \rightarrow \pi^0\pi^0 K^+K^-\gamma$

[102] AUBERT 07AK reports $[\Gamma(J/\psi(1S) \rightarrow \pi^0\pi^0 K^+K^-)/\Gamma_{total}] \times [\Gamma(J/\psi(1S) \rightarrow e^+e^-)] = (13.6 \pm 1.1 \pm 1.3) \times 10^{-3}$ keV which we divide by our best value $\Gamma(J/\psi(1S) \rightarrow e^+e^-) = 5.55 \pm 0.14 \pm 0.02$ keV. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(K\overline{K}\pi)/\Gamma_{total}$ $\qquad$ Γ_{92}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
61 ±10 OUR AVERAGE					
55.2±12.0	25	FRANKLIN	83	MRK2	$e^+e^- \to K^+K^-\pi^0$
78.0±21.0	126	VANNUCCI	77	MRK1	$e^+e^- \to K^0_S K^\pm \pi^\mp$

$\Gamma(2(\pi^+\pi^-))/\Gamma_{total}$ $\qquad$ Γ_{93}/Γ

VALUE (units 10^{-3})	EVTS		DOCUMENT ID		TECN	COMMENT
3.55±0.23 OUR AVERAGE						
3.53±0.12±0.29	1107	[103]	ABLIKIM	05H	BES2	$e^+e^- \to \psi(2S) \to$ $J/\psi\pi^+\pi^-$, $J/\psi \to$ $2(\pi^+\pi^-)$
3.51±0.34±0.09	270	[104]	AUBERT	05D	BABR	10.6 $e^+e^- \to 2(\pi^+\pi^-)\gamma$
4.0 ±1.0	76		JEAN-MARIE	76	MRK1	e^+e^-

[103] Computed using B$(J/\psi \to \mu^+\mu^-) = 0.0588 \pm 0.0010$.

[104] AUBERT 05D reports $[\Gamma(J/\psi(1S) \to 2(\pi^+\pi^-))/\Gamma_{total}] \times [\Gamma(J/\psi(1S) \to e^+e^-)]$ $= (19.5 \pm 1.4 \pm 1.3) \times 10^{-3}$ keV which we divide by our best value $\Gamma(J/\psi(1S) \to e^+e^-) = 5.55 \pm 0.14 \pm 0.02$ keV. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(3(\pi^+\pi^-))/\Gamma_{total}$ $\qquad$ Γ_{94}/Γ

VALUE (units 10^{-4})	EVTS		DOCUMENT ID		TECN	COMMENT
43 ± 4 OUR AVERAGE						
43.0± 2.9±2.8	496	[105]	AUBERT	06D	BABR	10.6 $e^+e^- \to 3(\pi^+\pi^-)\gamma$
40 ±20	32		JEAN-MARIE	76	MRK1	e^+e^-

[105] Using $\Gamma(J/\psi \to e^+e^-) = 5.52 \pm 0.14 \pm 0.04$ keV.

$\Gamma(2(\pi^+\pi^-\pi^0))/\Gamma_{total}$ $\qquad$ Γ_{95}/Γ

VALUE (units 10^{-2})	EVTS		DOCUMENT ID		TECN	COMMENT
1.62±0.09±0.19	761	[106]	AUBERT	06D	BABR	10.6 $e^+e^- \to 2(\pi^+\pi^-\pi^0)\gamma$

[106] Using $\Gamma(J/\psi \to e^+e^-) = 5.52 \pm 0.14 \pm 0.04$ keV.

$\Gamma(2(\pi^+\pi^-)\eta)/\Gamma_{total}$ $\qquad$ Γ_{96}/Γ

VALUE (units 10^{-3})	EVTS		DOCUMENT ID		TECN	COMMENT
2.29±0.24 OUR AVERAGE						
2.35±0.39±0.20	85	[107]	AUBERT	07AU	BABR	10.6 $e^+e^- \to 2(\pi^+\pi^-)\eta\gamma$
2.26±0.08±0.27	4839		ABLIKIM	05C	BES2	$e^+e^- \to 2(\pi^+\pi^-)\eta$

[107] AUBERT 07AU quotes $\Gamma_{ee}^{J/\psi} \cdot$ B$(J/\psi \to 2(\pi^+\pi^-)\eta) \cdot$ B$(\eta \to \gamma\gamma) = 5.16 \pm 0.85 \pm 0.39$ eV.

$\Gamma(3(\pi^+\pi^-)\eta)/\Gamma_{total}$ $\qquad$ Γ_{97}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
7.24±0.96±1.11	616	ABLIKIM	05C	BES2	$e^+e^- \to 3(\pi^+\pi^-)\eta$

$\Gamma(p\overline{p})/\Gamma_{total}$ $\qquad$ Γ_{98}/Γ

VALUE (units 10^{-3})	EVTS		DOCUMENT ID		TECN	COMMENT
2.17±0.07 OUR AVERAGE						
2.18±0.16±0.07	317	[108] WU		06	BELL	$B^+ \to p\overline{p}K^+$
2.26±0.01±0.14	63316	BAI		04E	BES2	$e^+e^- \to J/\psi$
1.97±0.22	99	BALDINI		98	FENI	e^+e^-
1.91±0.04±0.30		PALLIN		87	DM2	e^+e^-
2.16±0.07±0.15	1420	EATON		84	MRK2	e^+e^-
2.5 ±0.4	133	BRANDELIK		79C	DASP	e^+e^-
2.0 ±0.5		BESCH		78	BONA	e^+e^-
2.2 ±0.2	331	[109] PERUZZI		78	MRK1	e^+e^-

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

2.0 ±0.3	48	ANTONELLI		93	SPEC	e^+e^-

[108] WU 06 reports $[\Gamma(J/\psi(1S) \to p\overline{p})/\Gamma_{total}] \times [B(B^+ \to J/\psi(1S)K^+)] = (2.21 \pm 0.13 \pm 0.10) \times 10^{-6}$ which we divide by our best value $B(B^+ \to J/\psi(1S)K^+) = (1.013 \pm 0.034) \times 10^{-3}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[109] Assuming angular distribution $(1+\cos^2\theta)$.

$\Gamma(p\overline{p}\pi^0)/\Gamma_{total}$ $\qquad$ Γ_{99}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
1.19±0.08 OUR AVERAGE Error includes scale factor of 1.1.					
1.33±0.02±0.11	11k	ABLIKIM	09B	BES2	e^+e^-
1.13±0.09±0.09	685	EATON	84	MRK2	e^+e^-
1.4 ±0.4		BRANDELIK	79C	DASP	e^+e^-
1.00±0.15	109	PERUZZI	78	MRK1	e^+e^-

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

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
6.0 ±0.5 OUR AVERAGE Error includes scale factor of 1.3. See the ideogram below.					
6.46±0.17±0.43	1435	EATON	84	MRK2	e^+e^-
3.8 ±1.6	48	BESCH	81	BONA	e^+e^-
5.5 ±0.6	533	PERUZZI	78	MRK1	e^+e^-

WEIGHTED AVERAGE
6.0±0.5 (Error scaled by 1.3)

		χ^2
EATON	84 MRK2	1.0
BESCH	81 BONA	1.9
PERUZZI	78 MRK1	0.7
		3.6

(Confidence Level = 0.167)

$\Gamma\left(p\overline{p}\pi^+\pi^-\right)/\Gamma_{\text{total}}$ (units 10^{-3})

$\Gamma\left(p\overline{p}\pi^+\pi^-\pi^0\right)/\Gamma_{\text{total}}$ $\qquad\qquad$ Γ_{101}/Γ
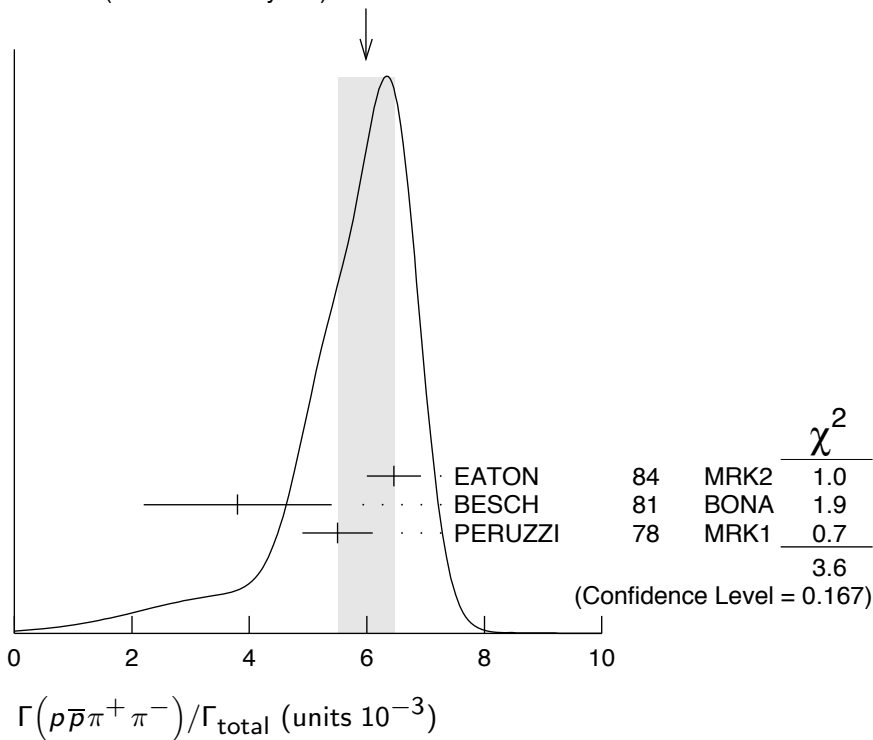
Including $p\overline{p}\pi^+\pi^-\gamma$ and excluding ω, η, η'

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
2.3 ±0.9 OUR AVERAGE		Error includes scale factor of 1.9.		
3.36±0.65±0.28	364	EATON	84 MRK2	e^+e^-
1.6 ±0.6	39	PERUZZI	78 MRK1	e^+e^-

$\Gamma\left(p\overline{p}\eta\right)/\Gamma_{\text{total}}$ $\qquad\qquad$ Γ_{102}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
2.00±0.12 OUR AVERAGE				
1.91±0.02±0.17	13k	[110] ABLIKIM	09 BES2	e^+e^-
2.03±0.13±0.15	826	EATON	84 MRK2	e^+e^-
2.5 ±1.2		BRANDELIK	79C DASP	e^+e^-
2.3 ±0.4	197	PERUZZI	78 MRK1	e^+e^-

[110] From the combination of $p\overline{p}\eta \to p\overline{p}\gamma\gamma$ and $p\overline{p}\eta \to p\overline{p}\pi^+\pi^-\pi^0$ channels.

$\Gamma\left(p\overline{p}\rho\right)/\Gamma_{\text{total}}$ $\qquad\qquad$ Γ_{103}/Γ

VALUE (units 10^{-3})	CL%	DOCUMENT ID	TECN	COMMENT
<0.31	90	EATON	84 MRK2	$e^+e^- \to$ hadronsγ

$\Gamma(p\overline{p}\omega)/\Gamma_{total}$ $\qquad$ Γ_{104}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
1.10±0.15 OUR AVERAGE		Error includes scale factor of 1.3. See the ideogram below.			
$0.98\pm0.03\pm0.14$	2449	ABLIKIM	08	BES2	e^+e^-
$1.10\pm0.17\pm0.18$	486	EATON	84	MRK2	e^+e^-
$1.6\ \pm0.3$	77	PERUZZI	78	MRK1	e^+e^-

WEIGHTED AVERAGE
1.10±0.15 (Error scaled by 1.3)

			χ^2
ABLIKIM	08	BES2	0.7
EATON	84	MRK2	0.0
PERUZZI	78	MRK1	2.8
			3.5

(Confidence Level = 0.176)

$\Gamma(p\overline{p}\omega)/\Gamma_{total}$ (units 10^{-3})

$\Gamma(p\overline{p}\eta'(958))/\Gamma_{total}$ $\qquad$ Γ_{105}/Γ
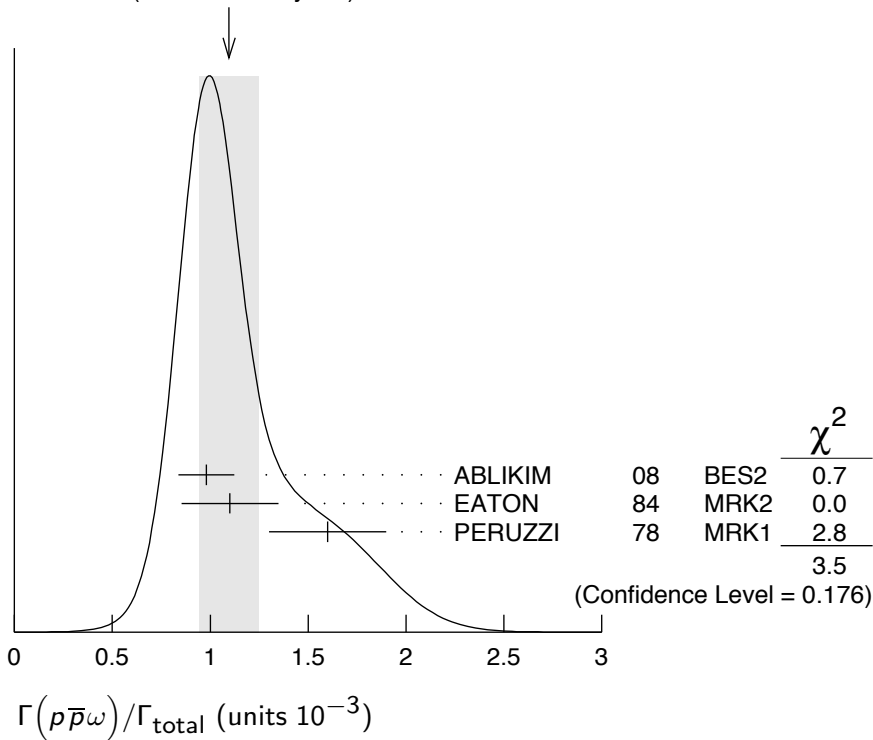
VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
0.21 ±0.04 OUR AVERAGE					
$0.200\pm0.023\pm0.028$	265 ± 31	[111] ABLIKIM	09	BES2	e^+e^-
$0.68\ \pm0.23\ \pm0.17$	19	EATON	84	MRK2	e^+e^-
$1.8\ \pm0.6$	19	PERUZZI	78	MRK1	e^+e^-

[111] From the combination of $p\overline{p}\eta' \to p\overline{p}\pi^+\pi^-\eta$ and $p\overline{p}\eta' \to p\overline{p}\gamma\rho^0$ channels.

$\Gamma(p\overline{p}\phi)/\Gamma_{total}$ $\qquad$ Γ_{106}/Γ

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
0.45±0.13±0.07	FALVARD	88	DM2	$J/\psi \to$ hadrons

$\Gamma(n\bar{n})/\Gamma_{total}$ Γ_{107}/Γ

VALUE (units 10^{-2})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
0.22 ±0.04 OUR AVERAGE					
0.231±0.049	79	BALDINI	98	FENI	e^+e^-
0.18 ±0.09		BESCH	78	BONA	e^+e^-
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.190±0.055	40	ANTONELLI	93	SPEC	e^+e^-

$\Gamma(n\bar{n}\pi^+\pi^-)/\Gamma_{total}$ Γ_{108}/Γ

VALUE (units 10^{-3})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
3.8±3.6	5	BESCH	81	BONA	e^+e^-

$\Gamma(\Sigma^+\overline{\Sigma}^-)/\Gamma_{total}$ Γ_{109}/Γ

VALUE (units 10^{-3})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
1.50±0.10±0.22	399	ABLIKIM	08O	BES2	$e^+e^- \to J/\psi$

$\Gamma(\Sigma^0\overline{\Sigma}^0)/\Gamma_{total}$ Γ_{110}/Γ

VALUE (units 10^{-3})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
1.29±0.09 OUR AVERAGE					
1.15±0.24±0.03		[112] AUBERT	07BD	BABR	10.6 $e^+e^- \to \Sigma^0\overline{\Sigma}^0\gamma$
1.33±0.04±0.11	1779	ABLIKIM	06	BES2	$J/\psi \to \Sigma^0\overline{\Sigma}^0$
1.06±0.04±0.23	884 ± 30	PALLIN	87	DM2	$e^+e^- \to \Sigma^0\overline{\Sigma}^0$
1.58±0.16±0.25	90	EATON	84	MRK2	$e^+e^- \to \Sigma^0\overline{\Sigma}^0$
1.3 ±0.4	52	PERUZZI	78	MRK1	$e^+e^- \to \Sigma^0\overline{\Sigma}^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
2.4 ±2.6	3	BESCH	81	BONA	$e^+e^- \to \Sigma^+\overline{\Sigma}^-$

[112] AUBERT 07BD reports $[\Gamma(J/\psi(1S) \to \Sigma^0\overline{\Sigma}^0)/\Gamma_{total}] \times [\Gamma(J/\psi(1S) \to e^+e^-)] = (6.4 \pm 1.2 \pm 0.6) \times 10^{-3}$ keV which we divide by our best value $\Gamma(J/\psi(1S) \to e^+e^-) = 5.55 \pm 0.14 \pm 0.02$ keV. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(2(\pi^+\pi^-)K^+K^-)/\Gamma_{total}$ Γ_{111}/Γ

VALUE (units 10^{-4})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
47 ± 7 OUR AVERAGE	Error includes scale factor of 1.3.				
49.8± 4.2±3.4	205	[113] AUBERT	06D	BABR	10.6 $e^+e^- \to \omega K^+K^- 2(\pi^+\pi^-)\gamma$
31 ±13	30	VANNUCCI	77	MRK1	e^+e^-

[113] Using $\Gamma(J/\psi \to e^+e^-) = 5.52 \pm 0.14 \pm 0.04$ keV.

$\Gamma(p\bar{n}\pi^-)/\Gamma_{total}$ Γ_{112}/Γ

VALUE (units 10^{-3})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
2.12±0.09 OUR AVERAGE					
2.36±0.02±0.21	59k	ABLIKIM	06K	BES2	$J/\psi \to p\pi^-\bar{n}$
2.47±0.02±0.24	55k	ABLIKIM	06K	BES2	$J/\psi \to \bar{p}\pi^+ n$
2.02±0.07±0.16	1288	EATON	84	MRK2	$e^+e^- \to p\pi^-$
1.93±0.07±0.16	1191	EATON	84	MRK2	$e^+e^- \to \bar{p}\pi^+$
1.7 ±0.7	32	BESCH	81	BONA	$e^+e^- \to p\pi^-$
1.6 ±1.2	5	BESCH	81	BONA	$e^+e^- \to \bar{p}\pi^+$
2.16±0.29	194	PERUZZI	78	MRK1	$e^+e^- \to p\pi^-$
2.04±0.27	204	PERUZZI	78	MRK1	$e^+e^- \to \bar{p}\pi^+$

$\Gamma(\Xi^-\overline{\Xi}^+)/\Gamma_{\text{total}}$ $\qquad\qquad$ Γ_{116}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
0.85±0.16 OUR AVERAGE		Error includes scale factor of 1.5. See the ideogram below.			
$0.70\pm0.06\pm0.12$	132 ± 11	HENRARD	87	DM2	$e^+e^- \to \Xi^-\overline{\Xi}^+$
$1.14\pm0.08\pm0.20$	194	EATON	84	MRK2	$e^+e^- \to \Xi^-\overline{\Xi}^+$
$1.4\ \pm0.5$	51	PERUZZI	78	MRK1	$e^+e^- \to \Xi^-\overline{\Xi}^+$

WEIGHTED AVERAGE
0.85±0.16 (Error scaled by 1.5)

			χ^2
HENRARD	87	DM2	1.3
EATON	84	MRK2	1.8
PERUZZI	78	MRK1	1.2
			4.3

(Confidence Level = 0.118)

$\Gamma(\Xi^-\overline{\Xi}^+)/\Gamma_{\text{total}}$ (units 10^{-3})

$\Gamma(\Lambda\overline{\Lambda})/\Gamma_{\text{total}}$ $\qquad\qquad$ Γ_{117}/Γ
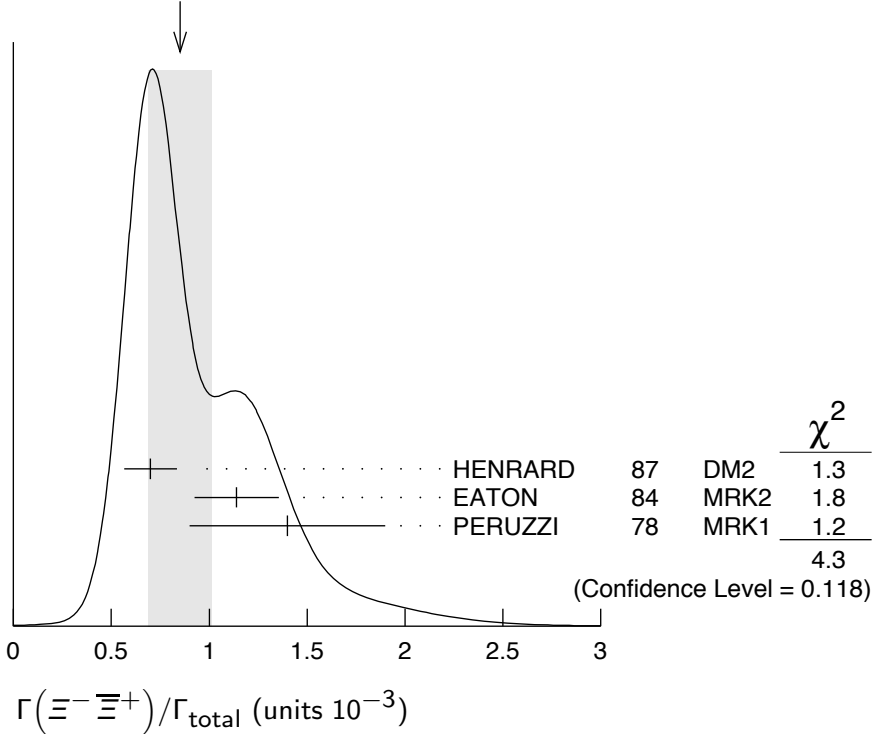
VALUE (units 10^{-3})	EVTS		DOCUMENT ID		TECN	COMMENT
1.61±0.15 OUR AVERAGE			Error includes scale factor of 2.0. See the ideogram below.			
$1.93\pm0.21\pm0.05$		[114]	AUBERT	07BD	BABR	$10.6\ e^+e^- \to \Lambda\overline{\Lambda}\gamma$
$2.03\pm0.03\pm0.15$	8887		ABLIKIM	06	BES2	$J/\psi \to \Lambda\overline{\Lambda}$
$2.0\ ^{+0.5}_{-0.4}\ \pm0.1$	46	[115]	WU	06	BELL	$B^+ \to \Lambda\overline{\Lambda}K^+$
$1.08\pm0.06\pm0.24$	631		BAI	98G	BES	e^+e^-
$1.38\pm0.05\pm0.20$	1847		PALLIN	87	DM2	e^+e^-
$1.58\pm0.08\pm0.19$	365		EATON	84	MRK2	e^+e^-
$2.6\ \pm1.6$	5		BESCH	81	BONA	e^+e^-
$1.1\ \pm0.2$	196		PERUZZI	78	MRK1	e^+e^-

[114] AUBERT 07BD reports $[\Gamma(J/\psi(1S) \to \Lambda\overline{\Lambda})/\Gamma_{\text{total}}] \times [\Gamma(J/\psi(1S) \to e^+e^-)] = (10.7\pm0.9\pm0.7)\times10^{-3}$ keV which we divide by our best value $\Gamma(J/\psi(1S) \to e^+e^-) = 5.55\pm0.14\pm0.02$ keV. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[115] WU 06 reports $[\Gamma(J/\psi(1S) \to \Lambda\overline{\Lambda})/\Gamma_{\text{total}}] \times [B(B^+ \to J/\psi(1S)K^+)] = (2.00^{+0.34}_{-0.29}\pm0.34)\times10^{-6}$ which we divide by our best value $B(B^+ \to J/\psi(1S)K^+)$

$= (1.013 \pm 0.034) \times 10^{-3}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

WEIGHTED AVERAGE
1.61±0.15 (Error scaled by 2.0)

			χ^2
AUBERT	07BD	BABR	2.3
ABLIKIM	06	BES2	7.6
WU	06	BELL	0.7
BAI	98G	BES	4.6
PALLIN	87	DM2	1.2
EATON	84	MRK2	0.0
BESCH	81	BONA	
PERUZZI	78	MRK1	6.5
			22.8

(Confidence Level = 0.0009)

$\Gamma\left(\Lambda\overline{\Lambda}\right)/\Gamma_{\text{total}}$ (units 10^{-3})
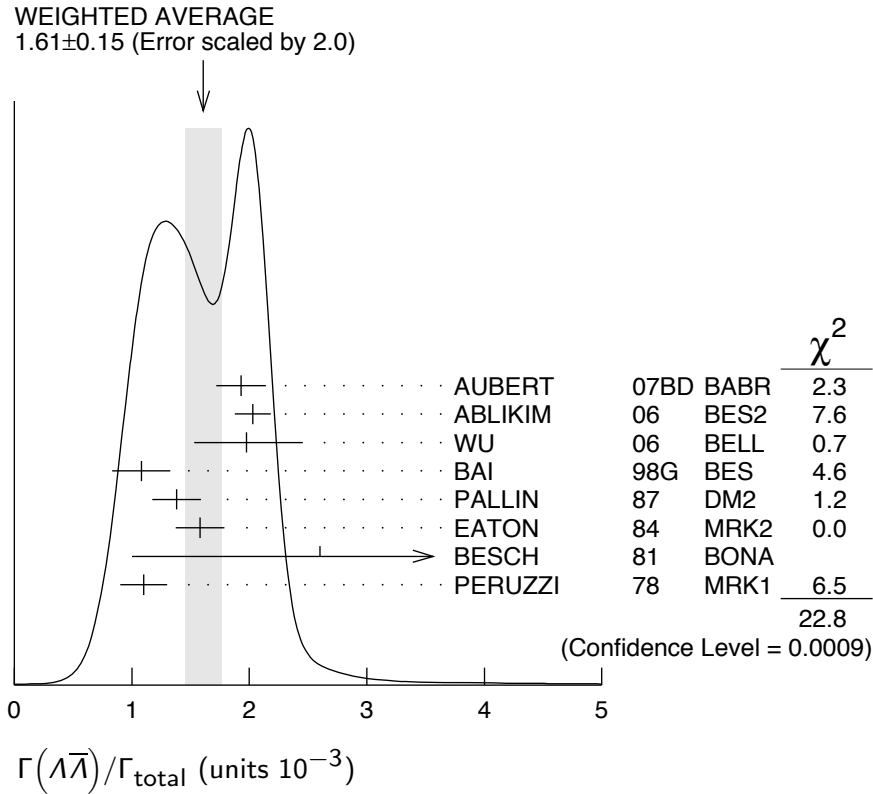
$\Gamma(\Lambda\overline{\Lambda})/\Gamma(p\overline{p})$ $\qquad\qquad$ Γ_{117}/Γ_{98}

VALUE	DOCUMENT ID		TECN	COMMENT
$0.90^{+0.15}_{-0.14}\pm0.10$	[116] WU	06	BELL	$B^+ \to p\overline{p}K^+, \Lambda\overline{\Lambda}K^+$

[116] Not independent of other $J/\psi \to \Lambda\overline{\Lambda}$, $p\overline{p}$ branching ratios reported by WU 06.

$\Gamma\left(\Lambda\overline{\Sigma}^-\pi^+(\text{or c.c.})\right)/\Gamma_{\text{total}}$ $\qquad\qquad$ Γ_{118}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
0.83 ±0.07 OUR AVERAGE		Error includes scale factor of 1.2.			
$0.770\pm0.051\pm0.083$	335	[117] ABLIKIM	07H	BES2	$e^+e^- \to \overline{\Lambda}\Sigma^+\pi^-$
$0.747\pm0.056\pm0.076$	254	[117] ABLIKIM	07H	BES2	$e^+e^- \to \Lambda\overline{\Sigma}^-\pi^+$
$0.90 \pm0.06 \pm0.16$	225 ± 15	HENRARD	87	DM2	$e^+e^- \to \overline{\Lambda}\Sigma^+\pi^-$
$1.11 \pm0.06 \pm0.20$	342 ± 18	HENRARD	87	DM2	$e^+e^- \to \Lambda\overline{\Sigma}^-\pi^+$
$1.53 \pm0.17 \pm0.38$	135	EATON	84	MRK2	$e^+e^- \to \overline{\Lambda}\Sigma^+\pi^-$
$1.38 \pm0.21 \pm0.35$	118	EATON	84	MRK2	$e^+e^- \to \Lambda\overline{\Sigma}^-\pi^+$

[117] Using B($\Lambda \to \pi^- p$) = 63.9% and B($\Sigma^+ \to \pi^0 p$) = 51.6%.

$\Gamma\left(pK^-\overline{\Lambda}\right)/\Gamma_{\text{total}}$ $\qquad\qquad$ Γ_{119}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
$0.89\pm0.07\pm0.14$	307	EATON	84	MRK2	e^+e^-

$\Gamma(2(K^+ K^-))/\Gamma_{total}$ $\qquad$ Γ_{120}/Γ

VALUE (units 10^{-3})	EVTS		DOCUMENT ID		TECN	COMMENT
0.76±0.09 OUR AVERAGE						
0.74±0.09±0.02	156 ± 15	[118] AUBERT		07AK	BABR	10.6 $e^+ e^- \to 2(K^+ K^-)\gamma$
1.4 $^{+0.5}_{-0.4}$ ±0.2	11.0$^{+4.3}_{-3.5}$	[119] HUANG		03	BELL	$B^+ \to 2(K^+ K^-) K^+$
0.7 ±0.3			VANNUCCI	77	MRK1	$e^+ e^-$

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

0.72±0.17±0.02	38	[120] AUBERT		05D	BABR	10.6 $e^+ e^- \to 2(K^+ K^-)\gamma$

[118] AUBERT 07AK reports $[\Gamma(J/\psi(1S) \to 2(K^+ K^-))/\Gamma_{total}] \times [\Gamma(J/\psi(1S) \to e^+ e^-)]$ = $(4.11 \pm 0.39 \pm 0.30) \times 10^{-3}$ keV which we divide by our best value $\Gamma(J/\psi(1S) \to e^+ e^-) = 5.55 \pm 0.14 \pm 0.02$ keV. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[119] Using B($B^+ \to J/\psi K^+$) = $(1.01 \pm 0.05) \times 10^{-3}$.

[120] Superseded by AUBERT 07AK. AUBERT 05D reports $[\Gamma(J/\psi(1S) \to 2(K^+ K^-))/\Gamma_{total}] \times [\Gamma(J/\psi(1S) \to e^+ e^-)]$ = $(4.0 \pm 0.7 \pm 0.6) \times 10^{-3}$ keV which we divide by our best value $\Gamma(J/\psi(1S) \to e^+ e^-) = 5.55 \pm 0.14 \pm 0.02$ keV. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(p K^- \overline{\Sigma}{}^0)/\Gamma_{total}$ $\qquad$ Γ_{121}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
0.29±0.06±0.05	90	EATON	84	MRK2	$e^+ e^-$

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

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
(2.37+-0.31) OUR AVERAGE					
2.39±0.24±0.22	107	BALTRUSAIT...85D		MRK3	$e^+ e^-$
2.2 ±0.9	6	BRANDELIK	79C	DASP	$e^+ e^-$

$\Gamma(K^0_S K^0_L)/\Gamma_{total}$ $\qquad$ Γ_{123}/Γ

VALUE (units 10^{-4})	EVTS		DOCUMENT ID		TECN	COMMENT
(1.46+-0.26) OUR AVERAGE		Error includes scale factor of 2.7. See the ideogram below.				
1.82±0.04±0.13	2155 ± 45	[121] BAI		04A	BES2	$J/\psi \to K^0_S K^0_L \to$ $\pi^+ \pi^- X$
1.18±0.12±0.18			JOUSSET	90	DM2	$J/\psi \to$ hadrons
1.01±0.16±0.09	74		BALTRUSAIT...85D		MRK3	$e^+ e^-$

[121] Using B($K^0_S \to \pi^+ \pi^-$) = 0.6868 ± 0.0027.

WEIGHTED AVERAGE
1.46±0.26 (Error scaled by 2.7)

			χ^2
BAI	04A	BES2	7.0
JOUSSET	90	DM2	1.7
BALTRUSAIT...	85D	MRK3	6.0
			14.7

(Confidence Level = 0.0006)

$\Gamma\left(K_S^0 K_L^0\right)/\Gamma_{\text{total}}$ Γ_{123}/Γ

$\Gamma\left(\Lambda\overline{\Lambda}\eta\right)/\Gamma_{\text{total}}$ Γ_{124}/Γ
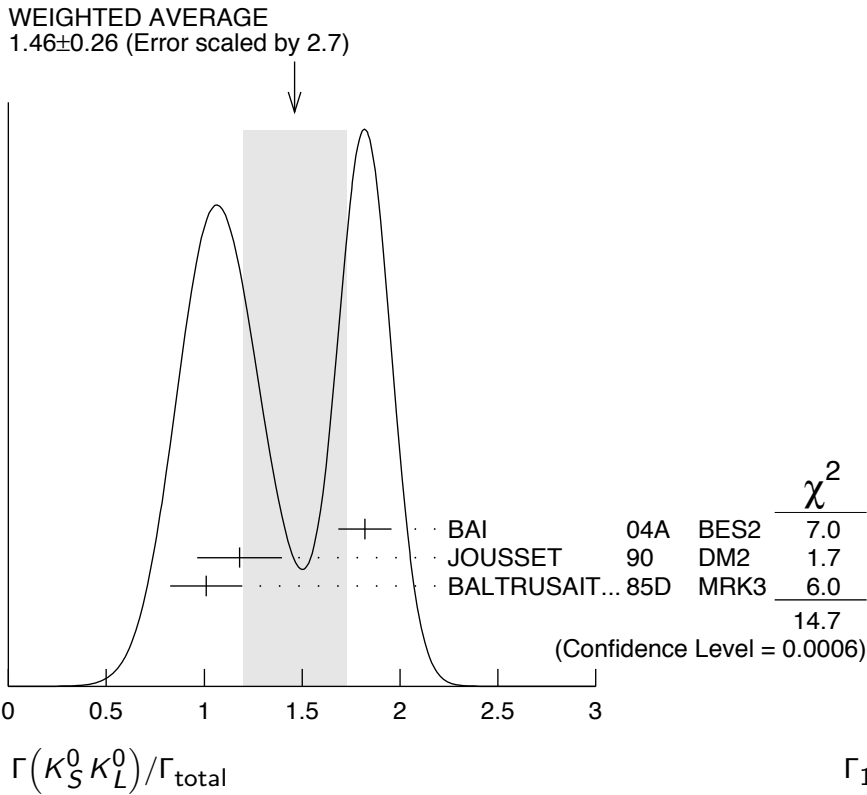
VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
2.62±0.60±0.44	44	[122] ABLIKIM 07H	BES2	$e^+e^- \to \psi(2S)$

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

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

VALUE (units 10^{-4})	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
<0.64	90		[123] ABLIKIM 07H	BES2	$e^+e^- \to \psi(2S)$

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

2.3 ±0.7±0.8		11	BAI 98G	BES	e^+e^-
2.2 ±0.5±0.5		19 ± 4	HENRARD 87	DM2	e^+e^-

[123] Using B($\Lambda \to \pi^- p$) = 63.9%.

$\Gamma\left(\overline{\Lambda}n K_S^0 + \text{c.c.}\right)/\Gamma_{\text{total}}$ Γ_{126}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
6.46±0.20±1.07	1058	[124] ABLIKIM 08C	BES2	$e^+e^- \to J/\psi$

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

$\Gamma\left(\pi^+\pi^-\right)/\Gamma_{\text{total}}$ Γ_{127}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
(1.47+-0.23) OUR AVERAGE				
1.58±0.20±0.15	84	BALTRUSAIT...85D	MRK3	e^+e^-
1.0 ±0.5	5	BRANDELIK 78B	DASP	e^+e^-
1.6 ±1.6	1	VANNUCCI 77	MRK1	e^+e^-

$\Gamma(\Lambda\overline{\Sigma}+\text{c.c.})/\Gamma_{\text{total}}$ $\qquad\qquad\Gamma_{128}/\Gamma$

VALUE (units 10^{-3})	CL%	DOCUMENT ID		TECN	COMMENT
<0.15	90	PERUZZI	78	MRK1	$e^+e^- \to \Lambda X$

$\Gamma(K^0_S K^0_S)/\Gamma_{\text{total}}$ $\qquad\qquad\Gamma_{129}/\Gamma$

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<0.01	95	[125] BAI	04D	BES	e^+e^-

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

<0.052	90	[125] BALTRUSAIT...85C		MRK3	e^+e^-

[125] Forbidden by *CP*.

—— RADIATIVE DECAYS ——

$\Gamma(3\gamma)/\Gamma_{\text{total}}$ $\qquad\qquad\Gamma_{130}/\Gamma$

VALUE (units 10^{-6})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
12±3±2		$24.2^{+7.2}_{-6.0}$	ADAMS	08	CLEO	$\psi(2S) \to \pi^+\pi^- J/\psi$

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

<55	90		PARTRIDGE	80	CBAL	e^+e^-

$\Gamma(4\gamma)/\Gamma_{\text{total}}$ $\qquad\qquad\Gamma_{131}/\Gamma$

VALUE (units 10^{-6})	CL%	DOCUMENT ID		TECN	COMMENT
<9	90	ADAMS	08	CLEO	$\psi(2S) \to \pi^+\pi^- J/\psi$

$\Gamma(5\gamma)/\Gamma_{\text{total}}$ $\qquad\qquad\Gamma_{132}/\Gamma$

VALUE (units 10^{-6})	CL%	DOCUMENT ID		TECN	COMMENT
<15	90	ADAMS	08	CLEO	$\psi(2S) \to \pi^+\pi^- J/\psi$

$\Gamma(\gamma\eta_c(1S))/\Gamma_{\text{total}}$ $\qquad\qquad\Gamma_{133}/\Gamma$

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
1.7 ±0.4 OUR AVERAGE		Error includes scale factor of 1.6.			
2.06±0.32±0.03		[126] MITCHELL	09	CLEO	$e^+e^- \to \gamma X$
1.27±0.36		GAISER	86	CBAL	$J/\psi \to \gamma X$

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

0.79±0.20	273 ± 43	[127] AUBERT	06E	BABR	$B^\pm \to K^\pm X_{c\overline{c}}$
seen	16	BALTRUSAIT...84		MRK3	$J/\psi \to 2\phi\gamma$

[126] MITCHELL 09 reports $(1.98 \pm 0.09 \pm 0.30) \times 10^{-2}$ from a measurement of $[\Gamma(J/\psi(1S) \to \gamma\eta_c(1S))/\Gamma_{\text{total}}] \times [\text{B}(\psi(2S) \to J/\psi(1S)\pi^+\pi^-)]$ assuming $\text{B}(\psi(2S) \to J/\psi(1S)\pi^+\pi^-) = (35.04 \pm 0.07 \pm 0.77) \times 10^{-2}$, which we rescale to our best value $\text{B}(\psi(2S) \to J/\psi(1S)\pi^+\pi^-) = (33.6 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[127] Calculated by the authors using an average of $\text{B}(J/\psi \to \gamma\eta_c) \times \text{B}(\eta_c \to K\overline{K}\pi)$ from BALTRUSAITIS 86, BISELLO 91, BAI 04 and $\text{B}(\eta_c \to K\overline{K}\pi) = (8.5 \pm 1.8)\%$ from AUBERT 06E.

$\Gamma(\gamma\eta_c(1S) \to 3\gamma)/\Gamma_{total}$ $\qquad$ Γ_{134}/Γ

VALUE (units 10^{-6})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
$\mathbf{1.2^{+2.7}_{-1.1}\pm0.3}$	$1.2^{+2.8}_{-1.1}$	ADAMS	08	CLEO	$\psi(2S) \to \pi^+\pi^- J/\psi$

$\Gamma(\gamma\pi^+\pi^-2\pi^0)/\Gamma_{total}$ $\qquad$ Γ_{135}/Γ

VALUE (units 10^{-3})		*DOCUMENT ID*		*TECN*	*COMMENT*
$\mathbf{8.3\pm0.2\pm3.1}$	[128]	BALTRUSAIT...86B		MRK3	$J/\psi \to 4\pi\gamma$

[128] 4π mass less than 2.0 GeV.

$\Gamma(\gamma\eta\pi\pi)/\Gamma_{total}$ $\qquad$ Γ_{136}/Γ

VALUE (units 10^{-3})		*DOCUMENT ID*		*TECN*	*COMMENT*
$\mathbf{6.1\ \pm1.0}$ **OUR AVERAGE**					
$5.85\pm0.3\pm1.05$	[129]	EDWARDS	83B	CBAL	$J/\psi \to \eta\pi^+\pi^-$
$7.8\ \pm1.2\pm2.4$	[129]	EDWARDS	83B	CBAL	$J/\psi \to \eta2\pi^0$

[129] Broad enhancement at 1700 MeV.

$\Gamma(\gamma\eta_2(1870) \to \gamma\eta\pi^+\pi^-)/\Gamma_{total}$ $\qquad$ Γ_{137}/Γ

VALUE (units 10^{-4})	*DOCUMENT ID*		*TECN*	*COMMENT*
$\mathbf{6.2\pm2.2\pm0.9}$	BAI	99	BES	$J/\psi \to \gamma\eta\pi^+\pi^-$

$\Gamma(\gamma\eta(1405/1475) \to \gamma K\overline{K}\pi)/\Gamma_{total}$ $\qquad$ Γ_{138}/Γ

VALUE (units 10^{-3})		*DOCUMENT ID*		*TECN*	*COMMENT*
$\mathbf{2.8\ \pm0.6}$ **OUR AVERAGE**	Error includes scale factor of 1.6. See the ideogram below.				
$1.66\pm0.1\ \pm0.58$	[130,131]	BAI	00D	BES	$J/\psi \to \gamma K^{\pm}K^0_S\pi^{\mp}$
$3.8\ \pm0.3\ \pm0.6$	[132]	AUGUSTIN	90	DM2	$J/\psi \to \gamma K\overline{K}\pi$
$4.0\ \pm0.7\ \pm1.0$	[132]	EDWARDS	82E	CBAL	$J/\psi \to K^+K^-\pi^0\gamma$
$4.3\ \pm1.7$	[132,133]	SCHARRE	80	MRK2	e^+e^-

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

$1.78\pm0.21\pm0.33$	[132,134,135]	AUGUSTIN	92	DM2	$J/\psi \to \gamma K\overline{K}\pi$
$0.83\pm0.13\pm0.18$	[132,136,137]	AUGUSTIN	92	DM2	$J/\psi \to \gamma K\overline{K}\pi$
$0.66^{+0.17+0.24}_{-0.16-0.15}$	[132,135,138]	BAI	90C	MRK3	$J/\psi \to \gamma K^0_S K^{\pm}\pi^{\mp}$
$1.03^{+0.21+0.26}_{-0.18-0.19}$	[132,137,139]	BAI	90C	MRK3	$J/\psi \to \gamma K^0_S K^{\pm}\pi^{\mp}$

[130] Interference with the $J/\psi(1S)$ radiative transition to the broad $K\overline{K}\pi$ pseudoscalar state around 1800 is $(0.15 \pm 0.01 \pm 0.05) \times 10^{-3}$.

[131] Interference with $J/\psi \to \gamma f_1(1420)$ is $(-0.03 \pm 0.01 \pm 0.01) \times 10^{-3}$.

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

[133] Corrected for spin-zero hypothesis for $\eta(1405)$.

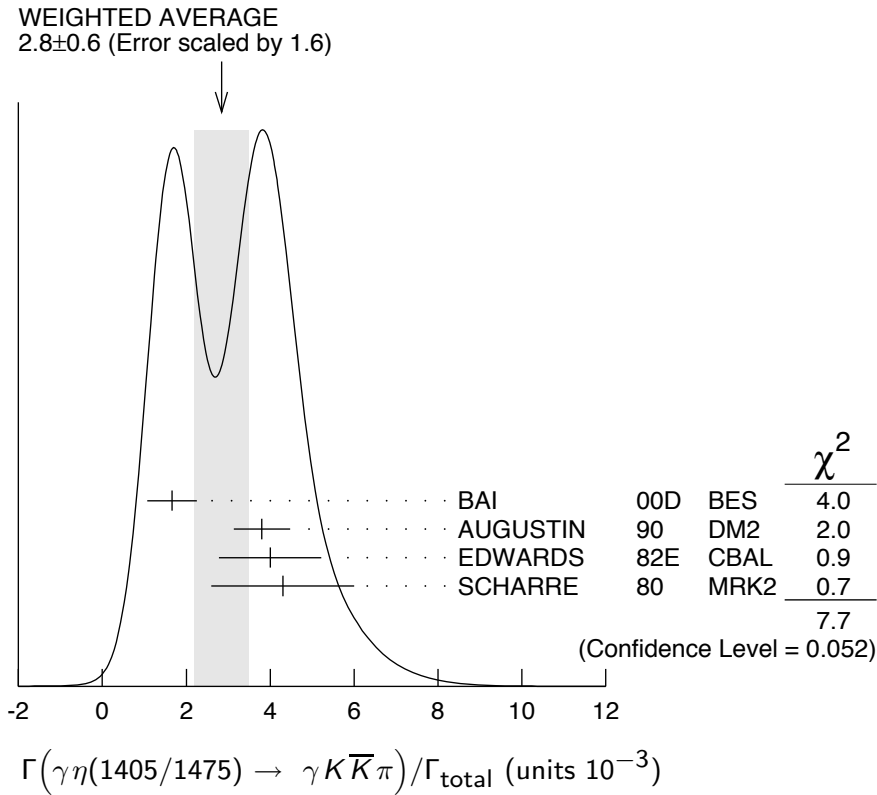[134] From fit to the $a_0(980)\pi$ 0^{-+} partial wave.

[135] $a_0(980)\pi$ mode.

[136] From fit to the $K^*(892)K$ 0^{-+} partial wave.

[137] K^*K mode.

[138] From $a_0(980)\pi$ final state.

[139] From $K^*(890)K$ final state.

WEIGHTED AVERAGE
2.8±0.6 (Error scaled by 1.6)

			χ^2
BAI	00D	BES	4.0
AUGUSTIN	90	DM2	2.0
EDWARDS	82E	CBAL	0.9
SCHARRE	80	MRK2	0.7
			7.7

(Confidence Level = 0.052)

$\Gamma\left(\gamma\eta(1405/1475) \rightarrow \gamma K \overline{K} \pi\right)/\Gamma_{\text{total}}$ (units 10^{-3})

$\Gamma\left(\gamma\eta(1405/1475) \rightarrow \gamma\gamma\rho^0\right)/\Gamma_{\text{total}}$ $\qquad$ Γ_{139}/Γ

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
0.78±0.20 OUR AVERAGE Error includes scale factor of 1.8.				
1.07±0.17±0.11	[140] BAI	04J	BES2	$J/\psi \rightarrow \gamma\gamma\pi^+\pi^-$
0.64±0.12±0.07	[140] COFFMAN	90	MRK3	$J/\psi \rightarrow \gamma\gamma\pi^+\pi^-$

[140] Includes unknown branching fraction $\eta(1405) \rightarrow \gamma\rho^0$.

$\Gamma\left(\gamma\eta(1405/1475) \rightarrow \gamma\eta\pi^+\pi^-\right)/\Gamma_{\text{total}}$ $\qquad$ Γ_{140}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
(3.0+−0.5) OUR AVERAGE					
2.6 ±0.7 ±0.4		BAI	99	BES	$J/\psi \rightarrow \gamma\eta\pi^+\pi^-$
3.38±0.33±0.64		[141] BOLTON	92B	MRK3	$J/\psi \rightarrow \gamma\eta\pi^+\pi^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
7.0 ±0.6 ±1.1	261	[142] AUGUSTIN	90	DM2	$J/\psi \rightarrow \gamma\eta\pi^+\pi^-$

[141] Via $a_0(980)\pi$.
[142] Includes unknown branching fraction to $\eta\pi^+\pi^-$.

$\Gamma\left(\gamma\eta(1405/1475) \rightarrow \gamma\gamma\phi\right)/\Gamma_{\text{total}}$ $\qquad$ Γ_{141}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<0.82	95	BAI	04J	BES2	$J/\psi \rightarrow \gamma\gamma K^+ K^-$

$\Gamma(\gamma\rho\rho)/\Gamma_{total}$ Γ_{142}/Γ

VALUE (units 10^{-3})	CL%	DOCUMENT ID	TECN	COMMENT
4.5 $\pm$0.8 OUR AVERAGE				
4.7 $\pm$0.3 $\pm$0.9		[143] BALTRUSAIT...86B	MRK3	$J/\psi \to 4\pi\gamma$
3.75$\pm$1.05$\pm$1.20		[144] BURKE 82	MRK2	$J/\psi \to 4\pi\gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<0.09	90	[145] BISELLO 89B		$J/\psi \to 4\pi\gamma$

[143] 4π mass less than 2.0 GeV.
[144] 4π mass less than 2.0 GeV. We have multiplied $2\rho^0$ measurement by 3 to obtain 2ρ.
[145] 4π mass in the range 2.0–25 GeV.

$\Gamma(\gamma\rho\omega)/\Gamma_{total}$ Γ_{143}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID	TECN	COMMENT
<5.4	90	ABLIKIM 08A	BES2	$e^+e^- \to J/\psi$

$\Gamma(\gamma\rho\phi)/\Gamma_{total}$ Γ_{144}/Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID	TECN	COMMENT
<8.8	90	ABLIKIM 08A	BES2	$e^+e^- \to J/\psi$

$\Gamma(\gamma\eta'(958))/\Gamma_{total}$ Γ_{145}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
5.16$\pm$0.15 OUR AVERAGE	Error includes scale factor of 1.1.			
4.86$\pm$0.23$\pm$0.08		[146] ABLIKIM 11	BES3	$J/\psi \to \eta'\gamma$
5.24$\pm$0.12$\pm$0.11		PEDLAR 09	CLE3	$J/\psi \to \eta'\gamma$
5.55$\pm$0.44	35k	ABLIKIM 06E	BES2	$J/\psi \to \eta'\gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
4.50$\pm$0.14$\pm$0.53		BOLTON 92B	MRK3	$J/\psi \to \gamma\pi^+\pi^-\eta, \eta \to \gamma\gamma$
4.30$\pm$0.31$\pm$0.71		BOLTON 92B	MRK3	$J/\psi \to \gamma\pi^+\pi^-\eta, \eta \to \pi^+\pi^-\pi^0$
4.04$\pm$0.16$\pm$0.85	622	AUGUSTIN 90	DM2	$J/\psi \to \gamma\eta\pi^+\pi^-$
4.39$\pm$0.09$\pm$0.66	2420	AUGUSTIN 90	DM2	$J/\psi \to \gamma\gamma\pi^+\pi^-$
4.1 $\pm$0.3 $\pm$0.6		BLOOM 83	CBAL	$e^+e^- \to 3\gamma + $ hadrons
2.9 $\pm$1.1	6	BRANDELIK 79C	DASP	$e^+e^- \to 3\gamma$
2.4 $\pm$0.7	57	BARTEL 76	CNTR	$e^+e^- \to 2\gamma\rho$

[146] ABLIKIM 11 reports $(4.84 \pm 0.03 \pm 0.24) \times 10^{-3}$ from a measurement of $[\Gamma(J/\psi(1S) \to \gamma\eta'(958))/\Gamma_{total}] / [B(\eta'(958) \to \pi^+\pi^-\eta)] / [B(\eta \to 2\gamma)]$ assuming $B(\eta'(958) \to \pi^+\pi^-\eta) = (43.2 \pm 0.7) \times 10^{-2}$, $B(\eta \to 2\gamma) = (39.31 \pm 0.20) \times 10^{-2}$, which we rescale to our best values $B(\eta'(958) \to \pi^+\pi^-\eta) = (43.4 \pm 0.7) \times 10^{-2}$, $B(\eta \to 2\gamma) = (39.31 \pm 0.20) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best values.

$\Gamma(\gamma 2\pi^+ 2\pi^-)/\Gamma_{total}$ Γ_{146}/Γ

VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
2.8 $\pm$0.5 OUR AVERAGE	Error includes scale factor of 1.9. See the ideogram below.		
4.32$\pm$0.14$\pm$0.73	[147] BISELLO 89B	DM2	$J/\psi \to 4\pi\gamma$
2.08$\pm$0.13$\pm$0.35	[148] BISELLO 89B	DM2	$J/\psi \to 4\pi\gamma$
3.05$\pm$0.08$\pm$0.45	[148] BALTRUSAIT...86B	MRK3	$J/\psi \to 4\pi\gamma$
4.85$\pm$0.45$\pm$1.20	[149] BURKE 82	MRK2	e^+e^-

[147] 4π mass less than 3.0 GeV.
[148] 4π mass less than 2.0 GeV.
[149] 4π mass less than 2.5 GeV.

WEIGHTED AVERAGE
2.8±0.5 (Error scaled by 1.9)

			χ^2
BISELLO	89B	DM2	4.2
BISELLO	89B	DM2	3.7
BALTRUSAIT...	86B	MRK3	0.3
BURKE	82	MRK2	2.5
			10.8
(Confidence Level = 0.013)			

$\Gamma(\gamma 2\pi^+ 2\pi^-)/\Gamma_{\text{total}}$ (units 10^{-3})
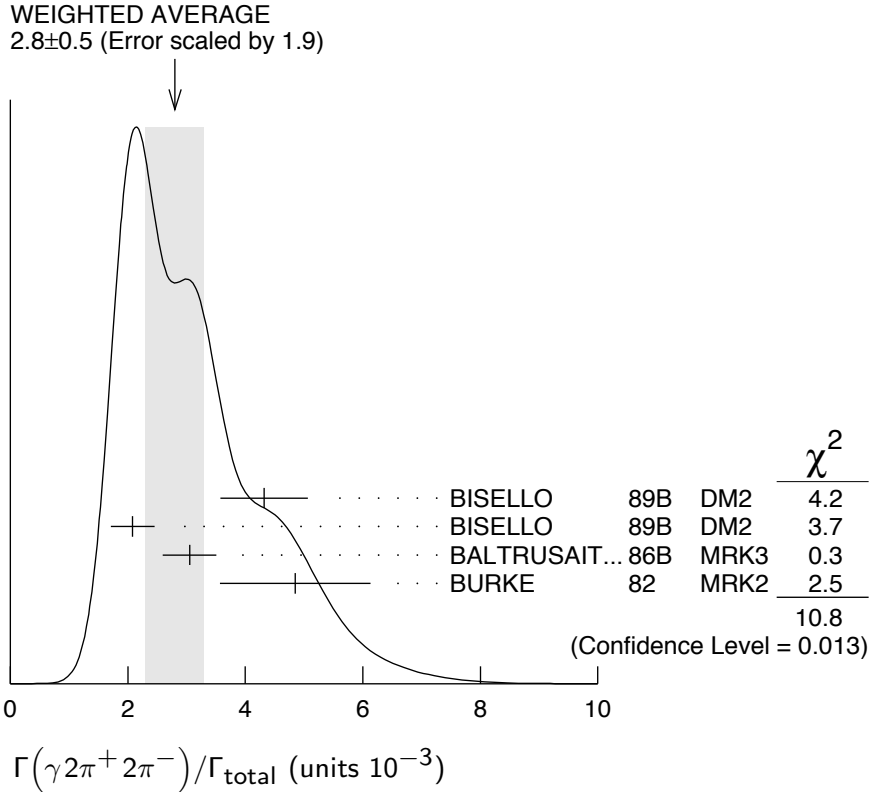
$\Gamma(\gamma f_2(1270) f_2(1270))/\Gamma_{\text{total}}$ Γ_{147}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
9.5±0.7±1.6	646 ± 45	ABLIKIM	04M	BES	$J/\psi \to \gamma 2\pi^+ 2\pi^-$

$\Gamma(\gamma f_2(1270) f_2(1270) (\text{non resonant}))/\Gamma_{\text{total}}$ Γ_{148}/Γ

VALUE (units 10^{-4})		DOCUMENT ID		TECN	COMMENT
8.2±0.8±1.7	[150]	ABLIKIM	04M	BES	$J/\psi \to \gamma 2\pi^+ 2\pi^-$

[150] Subtracting contribution from intermediate $\eta_c(1S)$ decays.

$\Gamma(\gamma K^+ K^- \pi^+ \pi^-)/\Gamma_{\text{total}}$ Γ_{149}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
2.1±0.1±0.6	1516	BAI	00B	BES	$J/\psi \to \gamma K^+ K^0 \pi^+ \pi^-$

$\Gamma(\gamma f_4(2050))/\Gamma_{\text{total}}$ Γ_{150}/Γ

VALUE (units 10^{-3})		DOCUMENT ID		TECN	COMMENT
2.7±0.5±0.5	[151]	BALTRUSAIT...87		MRK3	$J/\psi \to \gamma \pi^+ \pi^-$

[151] Assuming branching fraction $f_4(2050) \to \pi\pi/\text{total} = 0.167$.

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

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
1.61±0.33 OUR AVERAGE					
6.0 ±4.8 ±1.8		ABLIKIM	08A	BES2	$J/\psi \to \gamma\omega\pi^+\pi^-$
1.41±0.2 ±0.42	120 ± 17	BISELLO	87	SPEC	e^+e^-, hadronsγ
1.76±0.09±0.45		BALTRUSAIT...85C		MRK3	$e^+e^- \to$ hadronsγ

$\Gamma(\gamma\eta(1405/1475) \to \gamma\rho^0\rho^0)/\Gamma_{total}$ $\qquad$ Γ_{152}/Γ

VALUE (units 10^{-3})		DOCUMENT ID		TECN	COMMENT
1.7 ±0.4 OUR AVERAGE	Error includes scale factor of 1.3.				
2.1 ±0.4		BUGG	95	MRK3	$J/\psi \to \gamma\pi^+\pi^-\pi^+\pi^-$
1.36±0.38	152,153	BISELLO	89B	DM2	$J/\psi \to 4\pi\gamma$

[152] Estimated by us from various fits.
[153] Includes unknown branching fraction to $\rho^0\rho^0$.

$\Gamma(\gamma f_2(1270))/\Gamma_{total}$ $\qquad$ Γ_{153}/Γ

VALUE (units 10^{-3})	EVTS		DOCUMENT ID		TECN	COMMENT
1.43±0.11 OUR AVERAGE						
$1.62\pm0.26^{+0.02}_{-0.05}$		154	ABLIKIM	06V	BES2	$e^+e^- \to J/\psi \to \gamma\pi^+\pi^-$
$1.42\pm0.21^{+0.02}_{-0.04}$		155	ABLIKIM	06V	BES2	$e^+e^- \to J/\psi \to \gamma\pi^0\pi^0$
1.33±0.05±0.20		156	AUGUSTIN	87	DM2	$J/\psi \to \gamma\pi^+\pi^-$
1.36±0.09±0.23		156	BALTRUSAIT...87		MRK3	$J/\psi \to \gamma\pi^+\pi^-$
1.48±0.25±0.30	178		EDWARDS	82B	CBAL	$e^+e^- \to 2\pi^0\gamma$
2.0 ±0.7	35		ALEXANDER	78	PLUT	e^+e^-
1.2 ±0.6	30	157	BRANDELIK	78B	DASP	$e^+e^- \to \pi^+\pi^-\gamma$

[154] ABLIKIM 06V reports $[\Gamma(J/\psi(1S) \to \gamma f_2(1270))/\Gamma_{total}] \times [B(f_2(1270) \to \pi\pi)] = (1.371 \pm 0.010 \pm 0.222) \times 10^{-3}$ which we divide by our best value $B(f_2(1270) \to \pi\pi) = (84.8^{+2.4}_{-1.2}) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[155] ABLIKIM 06V reports $[\Gamma(J/\psi(1S) \to \gamma f_2(1270))/\Gamma_{total}] \times [B(f_2(1270) \to \pi\pi)] = (1.200 \pm 0.027 \pm 0.174) \times 10^{-3}$ which we divide by our best value $B(f_2(1270) \to \pi\pi) = (84.8^{+2.4}_{-1.2}) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[156] Estimated using $B(f_2(1270) \to \pi\pi) = 0.843 \pm 0.012$. The errors do not contain the uncertainty in the $f_2(1270)$ decay.

[157] Restated by us to take account of spread of E1, M2, E3 transitions.

$\Gamma(\gamma f_0(1710) \to \gamma K\overline{K})/\Gamma_{total}$ $\qquad$ Γ_{154}/Γ

VALUE (units 10^{-4})	CL%		DOCUMENT ID		TECN	COMMENT
(8.5+1.2-0.9) OUR AVERAGE	Error includes scale factor of 1.2.					
$9.62\pm029^{+3.51}_{-1.86}$		158	BAI	03G	BES	$J/\psi \to \gamma K\overline{K}$
$5.0 \pm 0.8^{+1.8}_{-0.4}$		159,160	BAI	96C	BES	$J/\psi \to \gamma K^+K^-$
9.2 ± 1.4±1.4		160	AUGUSTIN	88	DM2	$J/\psi \to \gamma K^+K^-$
10.4 ± 1.2±1.6		160	AUGUSTIN	88	DM2	$J/\psi \to \gamma K^0_S K^0_S$
9.6 ± 1.2±1.8		160	BALTRUSAIT...87		MRK3	$J/\psi \to \gamma K^+K^-$

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

$1.6 \pm 0.2^{+0.6}_{-0.2}$		160,161 BAI	96C	BES	$J/\psi \to \gamma K^+ K^-$
< 0.8	90	162 BISELLO	89B		$J/\psi \to 4\pi\gamma$
$1.6 \pm 0.4 \pm 0.3$		163 BALTRUSAIT...87		MRK3	$J/\psi \to \gamma\pi^+\pi^-$
3.8 ± 1.6		164 EDWARDS	82D	CBAL	$e^+e^- \to \eta\eta\gamma$

[158] Includes unknown branching ratio to $K^+ K^-$ or $K^0_S K^0_S$.

[159] Assuming $J^P = 2^+$ for $f_0(1710)$.

[160] Includes unknown branching fraction to $K^+ K^-$ or $K^0_S K^0_S$. We have multiplied $K^+ K^-$ measurement by 2, and $K^0_S K^0_S$ by 4 to obtain $K\overline{K}$ result.

[161] Assuming $J^P = 0^+$ for $f_0(1710)$.

[162] Includes unknown branching fraction to $\rho^0\rho^0$.

[163] Includes unknown branching fraction to $\pi^+\pi^-$.

[164] Includes unknown branching fraction to $\eta\eta$.

$\Gamma\left(\gamma f_0(1710) \to \gamma\pi\pi\right)/\Gamma_{\text{total}}$ Γ_{155}/Γ

VALUE (units 10^{-4})		DOCUMENT ID		TECN	COMMENT
(4.0+−1.0) OUR AVERAGE					
$3.96 \pm 0.06 \pm 1.12$		165 ABLIKIM	06V	BES2	$e^+e^- \to J/\psi \to \gamma\pi^+\pi^-$
$3.99 \pm 0.15 \pm 2.64$		165 ABLIKIM	06V	BES2	$e^+e^- \to J/\psi \to \gamma\pi^0\pi^0$

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

$2.5 \pm 1.6 \pm 0.8$		BAI	98H	BES	$J/\psi \to \gamma\pi^0\pi^0$

[165] Including unknown branching fraction to $\pi\pi$.

$\Gamma\left(\gamma f_0(1710) \to \gamma\omega\omega\right)/\Gamma_{\text{total}}$ Γ_{156}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
$0.31 \pm 0.06 \pm 0.08$	180	ABLIKIM	06H	BES	$J/\psi \to \gamma\omega\omega$

$\Gamma\left(\gamma\eta\right)/\Gamma_{\text{total}}$ Γ_{157}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
1.104 ± 0.034 OUR AVERAGE					
$1.101 \pm 0.029 \pm 0.022$		PEDLAR	09	CLE3	$J/\psi \to \eta\gamma$
1.123 ± 0.089	11k	ABLIKIM	06E	BES2	$J/\psi \to \eta\gamma$

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

$0.88 \pm 0.08 \pm 0.11$		BLOOM	83	CBAL	e^+e^-
0.82 ± 0.10		BRANDELIK	79C	DASP	e^+e^-
1.3 ± 0.4	21	BARTEL	77	CNTR	e^+e^-

$\Gamma\left(\gamma f_1(1420) \to \gamma K\overline{K}\pi\right)/\Gamma_{\text{total}}$ Γ_{158}/Γ

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
0.79 ± 0.13 OUR AVERAGE				
$0.68 \pm 0.04 \pm 0.24$	BAI	00D	BES	$J/\psi \to \gamma K^{\pm} K^0_S \pi^{\mp}$
$0.76 \pm 0.15 \pm 0.21$	166,167 AUGUSTIN	92	DM2	$J/\psi \to \gamma K\overline{K}\pi$
$0.87 \pm 0.14^{+0.14}_{-0.11}$	166 BAI	90C	MRK3	$J/\psi \to \gamma K^0_S K^{\pm}\pi^{\mp}$

[166] Included unknown branching fraction $f_1(1420) \to K\overline{K}\pi$.

[167] From fit to the $K^*(892)K$ 1^{++} partial wave.

$\Gamma\left(\gamma f_1(1285)\right)/\Gamma_{total}$ $\qquad$ Γ_{159}/Γ

VALUE (units 10^{-3})		DOCUMENT ID		TECN	COMMENT
0.61 ±0.08 OUR AVERAGE					
0.69 ±0.16 ±0.20	[168]	BAI	04J	BES2	$J/\psi \to \gamma\gamma\rho^0$
0.61 ±0.04 ±0.21	[169]	BAI	00D	BES	$J/\psi \to \gamma K^{\pm} K^0_S \pi^{\mp}$
0.45 ±0.09 ±0.17	[170]	BAI	99	BES	$J/\psi \to \gamma\eta\pi^+\pi^-$
0.625±0.063±0.103	[171]	BOLTON	92	MRK3	$J/\psi \to \gamma f_1(1285)$
0.70 ±0.08 ±0.16	[172]	BOLTON	92B	MRK3	$J/\psi \to \gamma\eta\pi^+\pi^-$

[168] Assuming B($f_1(1285) \to \rho^0\gamma) = 0.055 \pm 0.013$.

[169] Assuming $\Gamma(f_1(1285) \to K\overline{K}\pi)/\Gamma_{total} = 0.090 \pm 0.004$.

[170] Assuming $\Gamma(f_1(1285) \to \eta\pi\pi)/\Gamma_{total} = 0.5 \pm 0.18$.

[171] Obtained summing the sequential decay channels
  B($J/\psi \to \gamma f_1(1285), f_1(1285) \to \pi\pi\pi\pi) = (1.44 \pm 0.39 \pm 0.27) \times 10^{-4}$;
  B($J/\psi \to \gamma f_1(1285), f_1(1285) \to a_0(980)\pi, a_0(980) \to \eta\pi) = (3.90 \pm 0.42 \pm 0.87) \times 10^{-4}$;
  B($J/\psi \to \gamma f_1(1285), f_1(1285) \to a_0(980)\pi, a_0(980) \to K\overline{K}) = (0.66 \pm 0.26 \pm 0.29) \times 10^{-4}$;
  B($J/\psi \to \gamma f_1(1285), f_1(1285) \to \gamma\rho^0) = (0.25 \pm 0.07 \pm 0.03) \times 10^{-4}$.

[172] Using B($f_1(1285) \to a_0(980)\pi) = 0.37$, and including unknown branching ratio for $a_0(980) \to \eta\pi$.

$\Gamma\left(\gamma f_1(1510) \to \gamma\eta\pi^+\pi^-\right)/\Gamma_{total}$ $\qquad$ Γ_{160}/Γ

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
4.5±1.0±0.7	BAI	99	BES	$J/\psi \to \gamma\eta\pi^+\pi^-$

$\Gamma\left(\gamma f_2'(1525)\right)/\Gamma_{total}$ $\qquad$ Γ_{161}/Γ

VALUE (units 10^{-4})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
(4.5+0.7-0.4) OUR AVERAGE						
$3.85\pm0.17^{+1.91}_{-0.73}$			[173] BAI	03G	BES	$J/\psi \to \gamma K\overline{K}$
$3.6 \pm0.4 ^{+1.4}_{-0.4}$			[173] BAI	96C	BES	$J/\psi \to \gamma K^+ K^-$
5.6 ±1.4 ±0.9			[173] AUGUSTIN	88	DM2	$J/\psi \to \gamma K^+ K^-$
4.5 ±0.4 ±0.9			[173] AUGUSTIN	88	DM2	$J/\psi \to \gamma K^0_S K^0_S$
6.8 ±1.6 ±1.4			[173] BALTRUSAIT...87		MRK3	$J/\psi \to \gamma K^+ K^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<3.4	90	4	[174] BRANDELIK	79C	DASP	$e^+ e^- \to \pi^+\pi^-\gamma$
<2.3	90	3	ALEXANDER	78	PLUT	$e^+ e^- \to K^+ K^-\gamma$

[173] Using B($f_2'(1525) \to K\overline{K}) = 0.888$.

[174] Assuming isotropic production and decay of the $f_2'(1525)$ and isospin.

$\Gamma\left(\gamma f_2(1640) \to \gamma\omega\omega\right)/\Gamma_{total}$ $\qquad$ Γ_{162}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
0.28±0.05±0.17	141	ABLIKIM	06H	BES	$J/\psi \to \gamma\omega\omega$

$\Gamma\left(\gamma f_2(1910) \to \gamma\omega\omega\right)/\Gamma_{total}$ $\qquad$ Γ_{163}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
0.20±0.04±0.13	151	ABLIKIM	06H	BES	$J/\psi \to \gamma\omega\omega$

$\Gamma\left(\gamma f_2(1950) \to \gamma K^*(892)\overline{K}^*(892)\right)/\Gamma_{\text{total}}$ Γ_{164}/Γ

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
0.7 ±0.1 ±0.2	BAI	00B	BES	$J/\psi \to \gamma K^+ K^0 \pi^+ \pi^-$

$\Gamma\left(\gamma K^*(892)\overline{K}^*(892)\right)/\Gamma_{\text{total}}$ Γ_{165}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
4.0±0.3±1.3	320	[175] BAI	00B	BES	$J/\psi \to \gamma K^+ K^0 \pi^+ \pi^-$

[175] Summed over all charges.

$\Gamma\left(\gamma\phi\phi\right)/\Gamma_{\text{total}}$ Γ_{166}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
(4.0+−1.2) OUR AVERAGE		Error includes scale factor of 2.1. See the ideogram below.			
7.5±0.6±1.2	168	BAI	90B	MRK3	$J/\psi \to \gamma 4K$
3.4±0.8±0.6	33 ± 7	[176] BISELLO	90	DM2	$J/\psi \to \gamma K^+ K^- K^0_S K^0_L$
3.1±0.7±0.4		[176] BISELLO	86B	DM2	$J/\psi \to \gamma K^+ K^- K^+ K^-$

[176] $\phi\phi$ mass less than 2.9 GeV, η_c excluded.

WEIGHTED AVERAGE
4.0±1.2 (Error scaled by 2.1)

			χ^2
BAI	90B	MRK3	6.9
BISELLO	90	DM2	0.3
BISELLO	86B	DM2	1.2
			8.4

(Confidence Level = 0.015)

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

$\Gamma\left(\gamma p\overline{p}\right)/\Gamma_{\text{total}}$ Γ_{167}/Γ
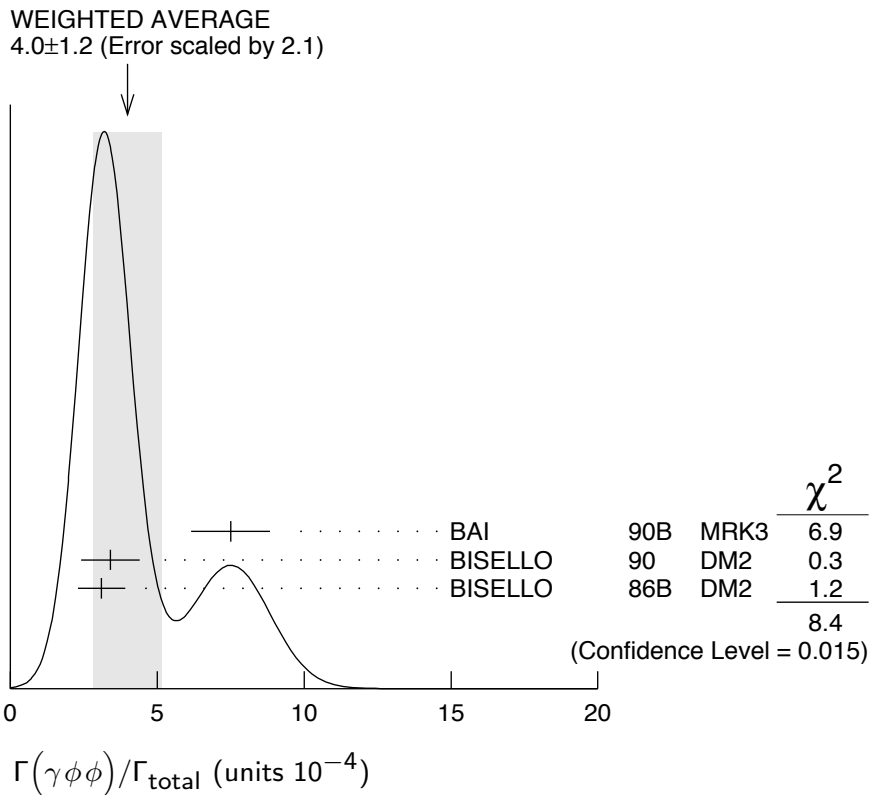
VALUE (units 10^{-3})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
0.38±0.07±0.07		49	EATON	84	MRK2	$e^+ e^-$

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

<0.11	90		PERUZZI	78	MRK1	$e^+ e^-$

$\Gamma(\gamma\eta(2225))/\Gamma_{total}$ $\qquad$ Γ_{168}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
0.33±0.05 OUR AVERAGE					
0.44±0.04±0.08	196 ± 19	[177] ABLIKIM	08I	BES	$J/\psi \to \gamma K^+ K^- K^0_S K^0_L$
0.33±0.08±0.05		[177] BAI	90B	MRK3	$J/\psi \to \gamma K^+ K^- K^+ K^-$
0.27±0.06±0.06		[177] BAI	90B	MRK3	$J/\psi \to \gamma K^+ K^- K^0_S K^0_L$
$0.24^{+0.15}_{-0.10}$		[178,179] BISELLO	89B	DM2	$J/\psi \to 4\pi\gamma$

[177] Includes unknown branching fraction to $\phi\phi$.
[178] Estimated by us from various fits.
[179] Includes unknown branching fraction to $\rho^0\rho^0$.

$\Gamma(\gamma\eta(1760) \to \gamma\rho^0\rho^0)/\Gamma_{total}$ $\qquad$ Γ_{169}/Γ

VALUE (units 10^{-3})		DOCUMENT ID		TECN	COMMENT
0.13±0.09		[180,181] BISELLO	89B	DM2	$J/\psi \to 4\pi\gamma$

[180] Estimated by us from various fits.
[181] Includes unknown branching fraction to $\rho^0\rho^0$.

$\Gamma(\gamma\eta(1760) \to \gamma\omega\omega)/\Gamma_{total}$ $\qquad$ Γ_{170}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
1.98±0.08±0.32	1045	ABLIKIM	06H	BES	$J/\psi \to \gamma\omega\omega$

$\Gamma(\gamma X(1835) \to \gamma\pi^+\pi^-\eta')/\Gamma_{total}$ $\qquad$ Γ_{171}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
(2.6+-0.4) OUR AVERAGE					
$2.87\pm0.09^{+0.49}_{-0.52}$	4265	[182] ABLIKIM	11C	BES3	$J/\psi \to \gamma\pi^+\pi^-\eta'$
2.2 ±0.4 ±0.4	264	ABLIKIM	05R	BES2	$J/\psi \to \gamma\pi^+\pi^-\eta'$

[182] From a fit of the $\pi^+\pi^-\eta'$ mass distribution to a combination of $\gamma f_1(1510)$, $\gamma X(1835)$, and two unconfirmed states $\gamma X(2120)$, and $\gamma X(2370)$, for $M(p\overline{p}) < 2.8$ GeV, and accounting for backgrounds from non-η' events and $J/\psi \to \pi^0\pi^+\pi^-\eta'$.

$\Gamma(\gamma X(1835) \to \gamma p\overline{p})/\Gamma_{total}$ $\qquad$ Γ_{172}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
$\mathbf{0.75^{+0.19}_{-0.09}}$ **OUR AVERAGE**					
$1.14^{+0.43+0.42}_{-0.30-0.26}$	231	[183] ALEXANDER	10	CLEO	$J/\psi \to \gamma p\overline{p}$
$0.70\pm0.04^{+0.19}_{-0.08}$		BAI	03F	BES2	$J/\psi \to \gamma p\overline{p}$

[183] From a fit of the $p\overline{p}$ mass distribution to a combination of $\gamma X(1835)$, γR with $M(R) = 2100$ MeV and $\Gamma(R) = 160$ MeV, and $\gamma p\overline{p}$ phase space, for $M(p\overline{p}) < 2.85$ GeV.

$\Gamma(\gamma(K\overline{K}\pi)[J^{PC}=0^{-+}])/\Gamma_{total}$ $\qquad$ Γ_{173}/Γ

VALUE (units 10^{-3})		DOCUMENT ID		TECN	COMMENT
0.7 ±0.4 OUR AVERAGE	Error includes scale factor of 2.1.				
0.58±0.03±0.20		[184] BAI	00D	BES	$J/\psi \to \gamma K^\pm K^0_S \pi^\mp$
2.1 ±0.1 ±0.7		[185] BAI	00D	BES	$J/\psi \to \gamma K^\pm K^0_S \pi^\mp$

[184] For a broad structure around 1800 MeV.
[185] For a broad structure around 2040 MeV.

$\Gamma(\gamma\pi^0)/\Gamma_{total}$ Γ_{174}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
(3.49+0.33-0.30) OUR AVERAGE					
$3.63 \pm 0.36 \pm 0.13$		PEDLAR	09	CLE3	$J/\psi \to \pi^0\gamma$
$3.13^{+0.65}_{-0.47}$	586	ABLIKIM	06E	BES2	$J/\psi \to \pi^0\gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$3.6 \pm 1.1 \pm 0.7$		BLOOM	83	CBAL	e^+e^-
7.3 ± 4.7	10	BRANDELIK	79C	DASP	e^+e^-

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

VALUE (units 10^{-3})	CL%	DOCUMENT ID		TECN	COMMENT
<0.79	90	EATON	84	MRK2	e^+e^-

$\Gamma(\gamma\Lambda\overline{\Lambda})/\Gamma_{total}$ Γ_{176}/Γ

VALUE (units 10^{-3})	CL%	DOCUMENT ID		TECN	COMMENT
<0.13	90	HENRARD	87	DM2	e^+e^-
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.16	90	BAI	98G	BES	e^+e^-

$\Gamma(\gamma f_0(2200))/\Gamma_{total}$ Γ_{177}/Γ

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1.5	[186] AUGUSTIN	88	DM2	$J/\psi \to \gamma K^0_S K^0_S$

[186] Includes unknown branching fraction to $K^0_S K^0_S$.

$\Gamma(\gamma f_J(2220))/\Gamma_{total}$ Γ_{178}/Γ

VALUE (units 10^{-5})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
>250	99.9		[187] HASAN	96	SPEC	$\bar{p}p \to \pi^+\pi^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
>300			[188] BAI	96B	BES	$e^+e^- \to \gamma\bar{p}p, K\overline{K}$
< 2.3	95		[189] AUGUSTIN	88	DM2	$J/\psi \to \gamma K^+K^-$
< 1.6	95		[189] AUGUSTIN	88	DM2	$J/\psi \to \gamma K^0_S K^0_S$
$12.4^{+6.4}_{-5.2} \pm 2.8$		23	[189] BALTRUSAIT...86D		MRK3	$J/\psi \to \gamma K^0_S K^0_S$
$8.4^{+3.4}_{-2.8} \pm 1.6$		93	[189] BALTRUSAIT...86D		MRK3	$J/\psi \to \gamma K^+K^-$

[187] Using BAI 96B.
[188] Using BARNES 93.
[189] Includes unknown branching fraction to K^+K^- or $K^0_S K^0_S$.

$\Gamma(\gamma f_J(2220) \to \gamma\pi\pi)/\Gamma_{total}$ Γ_{179}/Γ

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
$0.84 \pm 0.26 \pm 0.30$	BAI	96B	BES	$e^+e^- \to J/\psi \to \gamma\pi^+\pi^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$1.4 \pm 0.8 \pm 0.4$	BAI	98H	BES	$J/\psi \to \gamma\pi^0\pi^0$

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

VALUE (units 10^{-5})		DOCUMENT ID		TECN	COMMENT
< 3.6		[190] DEL-AMO-SA...10O		BABR	$e^+ e^- \to J/\psi \to \gamma K^+ K^-$

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

< 2.9		[190] DEL-AMO-SA...10O		BABR	$e^+ e^- \to J/\psi \to \gamma K^0_S K^0_S$
$6.6 \pm 2.9 \pm 2.4$		BAI	96B	BES	$e^+ e^- \to J/\psi \to \gamma K^+ K^-$
$10.8 \pm 4.0 \pm 3.2$		BAI	96B	BES	$e^+ e^- \to J/\psi \to \gamma K^0_S K^0_S$

[190] For spin 2 and helicity 0; other combinations lead to more stringent upper limits.

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

VALUE (units 10^{-5})	DOCUMENT ID		TECN	COMMENT
$1.5 \pm 0.6 \pm 0.5$	BAI	96B	BES	$e^+ e^- \to J/\psi \to \gamma p\overline{p}$

$\Gamma\left(\gamma f_0(1500)\right)/\Gamma_{total}$ $\qquad$ Γ_{182}/Γ

VALUE (units 10^{-4})		DOCUMENT ID		TECN	COMMENT
(1.01+-0.32) OUR AVERAGE					
$1.00 \pm 0.03 \pm 0.45$		[191] ABLIKIM	06V	BES2	$e^+ e^- \to J/\psi \to \gamma \pi^+ \pi^-$
$1.02 \pm 0.09 \pm 0.45$		[191] ABLIKIM	06V	BES2	$e^+ e^- \to J/\psi \to \gamma \pi^0 \pi^0$

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

>5.7 ± 0.8	[192,193] BUGG	95	MRK3	$J/\psi \to \gamma \pi^+ \pi^- \pi^+ \pi^-$

[191] Including unknown branching fraction to $\pi\pi$.
[192] Including unknown branching ratio for $f_0(1500) \to \pi^+ \pi^- \pi^+ \pi^-$.
[193] Assuming that $f_0(1500)$ decays only to two S-wave dipions.

$\Gamma\left(\gamma A \to \gamma \, \text{invisible}\right)/\Gamma_{total}$ $\qquad$ Γ_{183}/Γ
(narrow state A with $m_A < 960$ MeV)

VALUE (units 10^{-6})	CL%	DOCUMENT ID		TECN	COMMENT
<6.3	90	[194] INSLER	10	CLEO	$e^+ e^- \to \pi^+ \pi^- J/\psi$

[194] The limit varies with mass m_A of a narrow state A and is 4.3×10^{-6} for $m_A = 0$ MeV, reaches its largest value of 6.3×10^{-6} at $m_A = 500$ MeV, and is 3.6×10^{-6} at $m_A = 960$ MeV.

─────── WEAK DECAYS ───────

$\Gamma\left(D^- e^+ \nu_e + \text{c.c.}\right)/\Gamma_{total}$ $\qquad$ Γ_{184}/Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID		TECN	COMMENT
<1.2	90	ABLIKIM	06M	BES2	$e^+ e^- \to J/\psi$

$\Gamma\left(\overline{D}^0 e^+ e^- + \text{c.c.}\right)/\Gamma_{total}$ $\qquad$ Γ_{185}/Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID		TECN	COMMENT
<1.1	90	ABLIKIM	06M	BES2	$e^+ e^- \to J/\psi$

$\Gamma\left(D_s^- e^+ \nu_e + \text{c.c.}\right)/\Gamma_{total}$ $\qquad$ Γ_{186}/Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID		TECN	COMMENT
<3.6	90	[195] ABLIKIM	06M	BES2	$e^+ e^- \to J/\psi$

[195] Using B($D_s^- \to \phi\pi^-$) = 4.4 ± 0.5 %.

$\Gamma(D^-\pi^+ + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{187}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<7.5 \times 10^{-5}$	90	ABLIKIM	08J	BES2	$e^+ e^- \to J/\psi$

$\Gamma(\overline{D}^0 \overline{K}^0 + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{188}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<1.7 \times 10^{-4}$	90	ABLIKIM	08J	BES2	$e^+ e^- \to J/\psi$

$\Gamma(D_s^- \pi^+ + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{189}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<1.3 \times 10^{-4}$	90	ABLIKIM	08J	BES2	$e^+ e^- \to J/\psi$

$\Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ Γ_{190}/Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID		TECN	COMMENT
< 0.5	90	ADAMS	08	CLEO	$\psi(2S) \to \pi^+\pi^- J/\psi$

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

<16	90	[196] WICHT	08	BELL	$B^\pm \to K^\pm \gamma\gamma$
< 2.2	90	ABLIKIM	07J	BES2	$\psi(2S) \to J/\psi \pi^+\pi^-$
<50	90	BARTEL	77	CNTR	$e^+ e^-$

[196] WICHT 08 reports $[\Gamma(J/\psi(1S) \to \gamma\gamma)/\Gamma_{\text{total}}] \times [B(B^+ \to J/\psi(1S)K^+)] < 0.16 \times 10^{-6}$ which we divide by our best value $B(B^+ \to J/\psi(1S)K^+) = 1.013 \times 10^{-3}$.

—— LEPTON FAMILY NUMBER (*LF*) VIOLATING MODES ——

$\Gamma(e^\pm \mu^\mp)/\Gamma_{\text{total}}$ Γ_{191}/Γ

VALUE (units 10^{-6})	CL%	DOCUMENT ID		TECN	COMMENT
<1.1	90	BAI	03D	BES	$e^+ e^- \to J/\psi$

$\Gamma(e^\pm \tau^\mp)/\Gamma_{\text{total}}$ Γ_{192}/Γ

VALUE (units 10^{-6})	CL%	DOCUMENT ID		TECN	COMMENT
<8.3	90	ABLIKIM	04	BES	$e^+ e^- \to J/\psi$

$\Gamma(\mu^\pm \tau^\mp)/\Gamma_{\text{total}}$ Γ_{193}/Γ

VALUE (units 10^{-6})	CL%	DOCUMENT ID		TECN	COMMENT
<2.0	90	ABLIKIM	04	BES	$e^+ e^- \to J/\psi$

—— OTHER DECAYS ——

$\Gamma(\text{invisible})/\Gamma(\mu^+ \mu^-)$ Γ_{194}/Γ_7

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<1.2 \times 10^{-2}$	90	ABLIKIM	08G	BES2	$\psi(2S) \to \pi^+\pi^- J/\psi$

J/ψ(1S) REFERENCES

ABLIKIM	11	PR D83 012003	M. Ablikim *et al.*	(BES III Collab.)
ABLIKIM	11C	PRL 106 072002	M. Ablikim *et al.*	(BES III Collab.)
ABLIKIM	10C	PL B685 27	M. Ablikim *et al.*	(BES II Collab.)
ABLIKIM	10E	PL B693 88	M. Ablikim *et al.*	(BES II Collab.)
ALEXANDER	10	PR D82 092002	J.P. Alexander *et al.*	(CLEO Collab.)
ANASHIN	10	PL B685 134	V.V. Anashin *et al.*	(KEDR Collab.)
DEL-AMO-SA...	10O	PRL 105 172001	P. del Amo Sanchez *et al.*	(BABAR Collab.)
INSLER	10	PR D81 091101R	J. Insler *et al.*	(CLEO Collab.)
ABLIKIM	09	PL B676 25	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	09B	PR D80 052004	M. Ablikim *et al.*	(BES 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.)
SHEN	09	PR D80 031101R	C.P. Shen *et al.*	(BELLE Collab.)
ABLIKIM	08	EPJ C53 15	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	08A	PR D77 012001	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	08C	PL B659 789	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	08E	PR D77 032005	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	08F	PRL 100 102003	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	08G	PRL 100 192001	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	08I	PL B662 330	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	08J	PL B663 297	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	08O	PR D78 092005	M. Ablikim *et al.*	(BES Collab.)
ADAMS	08	PRL 101 101801	G.S. Adams *et al.*	(CLEO Collab.)
AUBERT	08S	PR D77 092002	B. Aubert *et al.*	(BABAR Collab.)
BESSON	08	PR D78 032012	D. Besson *et al.*	(CLEO Collab.)
PDG	08	PL B667 1	C. Amsler *et al.*	(PDG Collab.)
WICHT	08	PL B662 323	J. Wicht *et al.*	(BELLE Collab.)
ABLIKIM	07H	PR D76 092003	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	07J	PR D76 117101	M. Ablikim *et al.*	(BES Collab.)
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.)
ABLIKIM	06	PL B632 181	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	06C	PL B633 681	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	06E	PR D73 052008	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	06F	PR D73 052007	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	06H	PR D73 112007	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	06K	PRL 97 062001	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	06M	PL B639 418	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	06V	PL B642 441	M. Ablikim *et al.*	(BES Collab.)
ADAMS	06A	PR D73 051103R	G.S. Adams *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	06E	PRL 96 052002	B. Aubert *et al.*	(BABAR Collab.)
AUBERT,BE	06D	PR D74 091103R	B. Aubert *et al.*	(BABAR Collab.)
WU	06	PRL 97 162003	C.-H. Wu *et al.*	(BELLE Collab.)
ABLIKIM	05	PL B607 243	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	05B	PR D71 032003	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	05C	PL B610 192	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	05H	PR D72 012002	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	05R	PRL 95 262001	M. Ablikim *et al.*	(BES Collab.)
AUBERT	05D	PR D71 052001	B. Aubert *et al.*	(BABAR Collab.)
LI	05C	PR D71 111103	Z. Li *et al.*	(CLEO Collab.)
ABLIKIM	04	PL B598 172	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	04M	PR D70 112008	M. Ablikim *et al.*	(BES Collab.)
AUBERT	04	PR D69 011103	B. Aubert *et al.*	(BaBar Collab.)
AUBERT,B	04N	PR D70 072004	B. Aubert *et al.*	(BABAR Collab.)
BAI	04	PL B578 16	J.Z. Bai *et al.*	(BES Collab.)
BAI	04A	PR D69 012003	J.Z. Bai *et al.*	(BES Collab.)
BAI	04D	PL B589 7	J.Z. Bai *et al.*	(BES Collab.)
BAI	04E	PL B591 42	J.Z. Bai *et al.*	(BES Collab.)
BAI	04G	PR D70 012004	J.Z. Bai *et al.*	(BES Collab.)
BAI	04H	PR D70 012005	J.Z. Bai *et al.*	(BES Collab.)
BAI	04J	PL B594 47	J.Z. Bai *et al.*	(BES Collab.)
SETH	04	PR D69 097503	K.K. Seth	
AULCHENKO	03	PL B573 63	V.M. Aulchenko *et al.*	(KEDR Collab.)

BAI	03D	PL B561 49	J.Z. Bai *et al.*	(BES Collab.)
BAI	03F	PRL 91 022001	J.Z. Bai *et al.*	(BES II Collab.)
BAI	03G	PR D68 052003	J.Z. Bai *et al.*	(BES Collab.)
HUANG	03	PRL 91 241802	H.-C. Huang *et al.*	(BELLE Collab.)
BAI	02C	PRL 88 101802	J.Z. Bai *et al.*	(BES Collab.)
ARTAMONOV	00	PL B474 427	A.S. Artamonov *et al.*	
BAI	00	PRL 84 594	J.Z. Bai *et al.*	(BES Collab.)
BAI	00B	PL B472 200	J.Z. Bai *et al.*	(BES Collab.)
BAI	00D	PL B476 25	J.Z. Bai *et al.*	(BES Collab.)
BAI	99	PL B446 356	J.Z. Bai *et al.*	(BES Collab.)
BAI	99C	PRL 83 1918	J.Z. Bai *et al.*	(BES Collab.)
BAI	98D	PR D58 092006	J.Z. Bai *et al.*	(BES Collab.)
BAI	98G	PL B424 213	J.Z. Bai *et al.*	(BES Collab.)
BAI	98H	PRL 81 1179	J.Z. Bai *et al.*	(BES Collab.)
BALDINI	98	PL B444 111	R. Baldini *et al.*	(FENICE Collab.)
ARMSTRONG	96	PR D54 7067	T.A. Armstrong *et al.*	(E760 Collab.)
BAI	96B	PRL 76 3502	J.Z. Bai *et al.*	(BES Collab.)
BAI	96C	PRL 77 3959	J.Z. Bai *et al.*	(BES Collab.)
BAI	96D	PR D54 1221	J.Z. Bai *et al.*	(BES Collab.)
GRIBUSHIN	96	PR D53 4723	A. Gribushin *et al.*	(E672 Collab., E706 Collab.)
HASAN	96	PL B388 376	A. Hasan, D.V. Bugg	(BRUN, LOQM)
BAI	95B	PL B355 374	J.Z. Bai *et al.*	(BES Collab.)
BUGG	95	PL B353 378	D.V. Bugg *et al.*	(LOQM, PNPI, WASH)
ANTONELLI	93	PL B301 317	A. Antonelli *et al.*	(FENICE Collab.)
ARMSTRONG	93B	PR D47 772	T.A. Armstrong *et al.*	(FNAL E760 Collab.)
BARNES	93	PL B309 469	P.D. Barnes *et al.*	(PS185 Collab.)
AUGUSTIN	92	PR D46 1951	J.E. Augustin, G. Cosme	(DM2 Collab.)
BOLTON	92	PL B278 495	T. Bolton *et al.*	(Mark III Collab.)
BOLTON	92B	PRL 69 1328	T. Bolton *et al.*	(Mark III Collab.)
COFFMAN	92	PRL 68 282	D.M. Coffman *et al.*	(Mark III Collab.)
HSUEH	92	PR D45 R2181	S. Hsueh, S. Palestini	(FNAL, TORI)
BISELLO	91	NP B350 1	D. Bisello *et al.*	(DM2 Collab.)
AUGUSTIN	90	PR D42 10	J.E. Augustin *et al.*	(DM2 Collab.)
BAI	90B	PRL 65 1309	Z. Bai *et al.*	(Mark III Collab.)
BAI	90C	PRL 65 2507	Z. Bai *et al.*	(Mark III Collab.)
BISELLO	90	PL B241 617	D. Bisello *et al.*	(DM2 Collab.)
COFFMAN	90	PR D41 1410	D.M. Coffman *et al.*	(Mark III Collab.)
JOUSSET	90	PR D41 1389	J. Jousset *et al.*	(DM2 Collab.)
ALEXANDER	89	NP B320 45	J.P. Alexander *et al.*	(LBL, MICH, SLAC)
AUGUSTIN	89	NP B320 1	J.E. Augustin, G. Cosme	(DM2 Collab.)
BISELLO	89B	PR D39 701	G. Busetto *et al.*	(DM2 Collab.)
AUGUSTIN	88	PRL 60 2238	J.E. Augustin *et al.*	(DM2 Collab.)
COFFMAN	88	PR D38 2695	D.M. Coffman *et al.*	(Mark III Collab.)
FALVARD	88	PR D38 2706	A. Falvard *et al.*	(CLER, FRAS, LALO+)
AUGUSTIN	87	ZPHY C36 369	J.E. Augustin *et al.*	(LALO, CLER, FRAS+)
BAGLIN	87	NP B286 592	C. Baglin *et al.*	(LAPP, CERN, GENO, LYON+)
BALTRUSAIT...	87	PR D35 2077	R.M. Baltrusaitis *et al.*	(Mark III Collab.)
BECKER	87	PRL 59 186	J.J. Becker *et al.*	(Mark III Collab.)
BISELLO	87	PL B192 239	D. Bisello *et al.*	(PADO, CLER, FRAS+)
COHEN	87	RMP 59 1121	E.R. Cohen, B.N. Taylor	(RISC, NBS)
HENRARD	87	NP B292 670	P. Henrard *et al.*	(CLER, FRAS, LALO+)
PALLIN	87	NP B292 653	D. Pallin *et al.*	(CLER, FRAS, LALO, PADO)
BALTRUSAIT...	86	PR D33 629	R.M. Baltrusaitis *et al.*	(Mark III Collab.)
BALTRUSAIT...	86B	PR D33 1222	R.M. Baltrusaitis *et al.*	(Mark III Collab.)
BALTRUSAIT...	86D	PRL 56 107	R.M. Baltrusaitis	(CIT, UCSC, ILL, SLAC+)
BISELLO	86B	PL B179 294	D. Bisello *et al.*	(DM2 Collab.)
GAISER	86	PR D34 711	J. Gaiser *et al.*	(Crystal Ball Collab.)
BALTRUSAIT...	85C	PRL 55 1723	R.M. Baltrusaitis *et al.*	(CIT, UCSC+)
BALTRUSAIT...	85D	PR D32 566	R.M. Baltrusaitis *et al.*	(CIT, UCSC+)
KURAEV	85	SJNP 41 466	E.A. Kuraev, V.S. Fadin	(NOVO)
		Translated from YAF 41 733.		
BALTRUSAIT...	84	PRL 52 2126	R.M. Baltrusaitis *et al.*	(CIT, UCSC+)
EATON	84	PR D29 804	M.W. Eaton *et al.*	(LBL, SLAC)
BLOOM	83	ARNS 33 143	E.D. Bloom, C. Peck	(SLAC, CIT)
EDWARDS	83B	PRL 51 859	C. Edwards *et al.*	(CIT, HARV, PRIN+)
FRANKLIN	83	PRL 51 963	M.E.B. Franklin *et al.*	(LBL, SLAC)
BURKE	82	PRL 49 632	D.L. Burke *et al.*	(LBL, SLAC)
EDWARDS	82B	PR D25 3065	C. Edwards *et al.*	(CIT, HARV, PRIN+)
EDWARDS	82D	PRL 48 458	C. Edwards *et al.*	(CIT, HARV, PRIN+)
Also		ARNS 33 143	E.D. Bloom, C. Peck	(SLAC, CIT)
EDWARDS	82E	PRL 49 259	C. Edwards *et al.*	(CIT, HARV, PRIN+)

LEMOIGNE	82	PL 113B 509	Y. Lemoigne *et al.*	(SACL, LOIC, SHMP+)
BESCH	81	ZPHY C8 1	H.J. Besch *et al.*	(BONN, DESY, MANZ)
GIDAL	81	PL 107B 153	G. Gidal *et al.*	(SLAC, LBL)
PARTRIDGE	80	PRL 44 712	R. Partridge *et al.*	(CIT, HARV, PRIN+)
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	79C	ZPHY C1 233	R. Brandelik *et al.*	(DASP Collab.)
ALEXANDER	78	PL 72B 493	G. Alexander *et al.*	(DESY, HAMB, SIEG+)
BESCH	78	PL 78B 347	H.J. Besch *et al.*	(BONN, DESY, MANZ)
BRANDELIK	78B	PL 74B 292	R. Brandelik *et al.*	(DASP Collab.)
PERUZZI	78	PR D17 2901	I. Peruzzi *et al.*	(SLAC, LBL)
BARTEL	77	PL 66B 489	W. Bartel *et al.*	(DESY, HEIDP)
BURMESTER	77D	PL 72B 135	J. Burmester *et al.*	(DESY, HAMB, SIEG+)
FELDMAN	77	PRPL 33C 285	G.J. Feldman, M.L. Perl	(LBL, SLAC)
VANNUCCI	77	PR D15 1814	F. Vannucci *et al.*	(SLAC, LBL)
BARTEL	76	PL 64B 483	W. Bartel *et al.*	(DESY, HEIDP)
BRAUNSCH...	76	PL 63B 487	W. Braunschweig *et al.*	(DASP Collab.)
JEAN-MARIE	76	PRL 36 291	B. Jean-Marie *et al.*	(SLAC, LBL) IG
BALDINI-...	75	PL 58B 471	R. Baldini-Celio *et al.*	(FRAS, ROMA)
BOYARSKI	75	PRL 34 1357	A.M. Boyarski *et al.*	(SLAC, LBL) JPC
DASP	75	PL 56B 491	W. Braunschweig *et al.*	(DASP Collab.)
ESPOSITO	75B	LNC 14 73	B. Esposito *et al.*	(FRAS, NAPL, PADO+)
FORD	75	PRL 34 604	R.L. Ford *et al.*	(SLAC, PENN)