

$J/\psi(1S)$

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

 $J/\psi(1S)$ MASS

<u>VALUE (MeV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
3096.916±0.011 OUR AVERAGE				
3096.917±0.010±0.007		AULCHENKO 03	KEDR	$e^+e^- \rightarrow \text{hadrons}$
3096.89 ±0.09	502	¹ ARTAMONOV 00	OLYA	$e^+e^- \rightarrow \text{hadrons}$
3096.91 ±0.03 ±0.01		² ARMSTRONG 93B	E760	$\bar{p}p \rightarrow e^+e^-$
3096.95 ±0.1 ±0.3	193	BAGLIN 87	SPEC	$\bar{p}p \rightarrow e^+e^-X$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
3097.5 ±0.3		GRIBUSHIN 96	FMPS	515 $\pi^- \text{Be} \rightarrow 2\mu X$
3098.4 ±2.0	38k	LEMOIGNE 82	GOLI	185 $\pi^- \text{Be} \rightarrow \gamma \mu^+ \mu^- A$
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³ Superseded by ARTAMONOV 00.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

<u>VALUE (keV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
92.9± 2.8 OUR AVERAGE Error includes scale factor of 1.1.				
96.1± 3.2	13k	¹ ADAMS 06A	CLEO	$e^+e^- \rightarrow \mu^+\mu^-\gamma$
84.4± 8.9		BAI 95B	BES	e^+e^-
91 ±11 ±6		² ARMSTRONG 93B	E760	$\bar{p}p \rightarrow e^+e^-$
85.5 ⁺ ₋ 6.1 5.8		³ HSUEH 92	RVUE	See Υ mini-review
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
94.1± 2.7		⁴ ANASHIN 10	KEDR	3.097 $e^+e^- \rightarrow e^+e^-, \mu^+\mu^-$
93.7± 3.5	7.8k	¹ AUBERT 04	BABR	$e^+e^- \rightarrow \mu^+\mu^-\gamma$

¹ 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 $B(\mu^+\mu^-) = (5.93 \pm 0.06)\%$.

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

³ Using data from COFFMAN 92, BALDINI-CELIO 75, BOYARSKI 75, ESPOSITO 75B, BRANDELIK 79C.

⁴ Assuming $\Gamma(e^+e^-) = \Gamma(\mu^+\mu^-)$ and using $\Gamma(e^+e^-)/\Gamma_{\text{total}} = (5.94 \pm 0.06)\%$.

$J/\psi(1S)$ 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 $g g g$	(64.1 \pm 1.0) %	
Γ_4 $\gamma g g$	(8.8 \pm 1.1) %	
Γ_5 $e^+ e^-$	(5.971 \pm 0.032) %	
Γ_6 $e^+ e^- \gamma$	[a] (8.8 \pm 1.4) $\times 10^{-3}$	
Γ_7 $\mu^+ \mu^-$	(5.961 \pm 0.033) %	

Decays involving hadronic resonances

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} $K^*(892)^0 \bar{K}^*(892)^0$	(2.3 \pm 0.7) $\times 10^{-4}$	
Γ_{16} $K^*(892)^\pm K^*(892)^\mp$	(1.00 $^{+0.22}_{-0.40}$) $\times 10^{-3}$	
Γ_{17} $K^*(892)^\pm K^*(800)^\mp$	(1.1 $^{+1.0}_{-0.6}$) $\times 10^{-3}$	
Γ_{18} $\eta K^*(892)^0 \bar{K}^*(892)^0$	(1.15 \pm 0.26) $\times 10^{-3}$	
Γ_{19} $K^*(892)^0 \bar{K}_2^*(1430)^0 + c.c.$	(6.0 \pm 0.6) $\times 10^{-3}$	
Γ_{20} $K^*(892)^0 \bar{K}_2^*(1770)^0 + c.c. \rightarrow$ $K^*(892)^0 K^- \pi^+ + c.c.$	(6.9 \pm 0.9) $\times 10^{-4}$	
Γ_{21} $\omega K^*(892) \bar{K} + c.c.$	(6.1 \pm 0.9) $\times 10^{-3}$	
Γ_{22} $K^+ K^*(892)^- + c.c.$	(5.12 \pm 0.30) $\times 10^{-3}$	
Γ_{23} $K^+ K^*(892)^- + c.c. \rightarrow$ $K^+ K^- \pi^0$	(1.97 \pm 0.20) $\times 10^{-3}$	
Γ_{24} $K^+ K^*(892)^- + c.c. \rightarrow$ $K^0 K^\pm \pi^\mp + c.c.$	(3.0 \pm 0.4) $\times 10^{-3}$	
Γ_{25} $K^0 \bar{K}^*(892)^0 + c.c.$	(4.39 \pm 0.31) $\times 10^{-3}$	
Γ_{26} $K^0 \bar{K}^*(892)^0 + c.c. \rightarrow$ $K^0 K^\pm \pi^\mp + c.c.$	(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} $\bar{K}^*(892)^0 K^+ \pi^- + c.c.$	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} $\phi K^*(892) \bar{K} + c.c.$	(2.18 \pm 0.23) $\times 10^{-3}$	

Γ_{35}	$\omega K\bar{K}$		$(1.70 \pm 0.32) \times 10^{-3}$	
Γ_{36}	$\omega f_0(1710) \rightarrow \omega K\bar{K}$		$(4.8 \pm 1.1) \times 10^{-4}$	
Γ_{37}	$\phi 2(\pi^+\pi^-)$		$(1.66 \pm 0.23) \times 10^{-3}$	
Γ_{38}	$\Delta(1232)^{++} \bar{p}\pi^-$		$(1.6 \pm 0.5) \times 10^{-3}$	
Γ_{39}	$\omega\eta$		$(1.74 \pm 0.20) \times 10^{-3}$	S=1.6
Γ_{40}	$\phi K\bar{K}$		$(1.83 \pm 0.24) \times 10^{-3}$	S=1.5
Γ_{41}	$\phi f_0(1710) \rightarrow \phi K\bar{K}$		$(3.6 \pm 0.6) \times 10^{-4}$	
Γ_{42}	$\phi f_2(1270)$		$(7.2 \pm 1.3) \times 10^{-4}$	
Γ_{43}	$\Delta(1232)^{++} \bar{\Delta}(1232)^{--}$		$(1.10 \pm 0.29) \times 10^{-3}$	
Γ_{44}	$\Sigma(1385)^- \bar{\Sigma}(1385)^+ \text{ (or c.c.)}$	[b]	$(1.10 \pm 0.12) \times 10^{-3}$	
Γ_{45}	$\phi f_2'(1525)$		$(8 \pm 4) \times 10^{-4}$	S=2.7
Γ_{46}	$\phi\pi^+\pi^-$		$(9.4 \pm 0.9) \times 10^{-4}$	S=1.2
Γ_{47}	$\phi\pi^0\pi^0$		$(5.6 \pm 1.6) \times 10^{-4}$	
Γ_{48}	$\phi K^\pm K_S^0 \pi^\mp$	[b]	$(7.2 \pm 0.8) \times 10^{-4}$	
Γ_{49}	$\omega f_1(1420)$		$(6.8 \pm 2.4) \times 10^{-4}$	
Γ_{50}	$\phi\eta$		$(7.5 \pm 0.8) \times 10^{-4}$	S=1.5
Γ_{51}	$\Xi^0 \Xi^0$		$(1.20 \pm 0.24) \times 10^{-3}$	
Γ_{52}	$\Xi(1530)^- \Xi^+$		$(5.9 \pm 1.5) \times 10^{-4}$	
Γ_{53}	$\rho K^- \bar{\Sigma}(1385)^0$		$(5.1 \pm 3.2) \times 10^{-4}$	
Γ_{54}	$\omega\pi^0$		$(4.5 \pm 0.5) \times 10^{-4}$	S=1.4
Γ_{55}	$\phi\eta'(958)$		$(4.0 \pm 0.7) \times 10^{-4}$	S=2.1
Γ_{56}	$\phi f_0(980)$		$(3.2 \pm 0.9) \times 10^{-4}$	S=1.9
Γ_{57}	$\phi f_0(980) \rightarrow \phi\pi^+\pi^-$		$(1.8 \pm 0.4) \times 10^{-4}$	
Γ_{58}	$\phi f_0(980) \rightarrow \phi\pi^0\pi^0$		$(1.7 \pm 0.7) \times 10^{-4}$	
Γ_{59}	$\eta\phi f_0(980) \rightarrow \eta\phi\pi^+\pi^-$		$(3.2 \pm 1.0) \times 10^{-4}$	
Γ_{60}	$\phi a_0(980)^0 \rightarrow \phi\eta\pi^0$		$(5 \pm 4) \times 10^{-6}$	
Γ_{61}	$\Xi(1530)^0 \Xi^0$		$(3.2 \pm 1.4) \times 10^{-4}$	
Γ_{62}	$\Sigma(1385)^- \bar{\Sigma}^+ \text{ (or c.c.)}$	[b]	$(3.1 \pm 0.5) \times 10^{-4}$	
Γ_{63}	$\phi f_1(1285)$		$(2.6 \pm 0.5) \times 10^{-4}$	S=1.1
Γ_{64}	$\eta\pi^+\pi^-$		$(4.0 \pm 1.7) \times 10^{-4}$	
Γ_{65}	$\rho\eta$		$(1.93 \pm 0.23) \times 10^{-4}$	
Γ_{66}	$\omega\eta'(958)$		$(1.82 \pm 0.21) \times 10^{-4}$	
Γ_{67}	$\omega f_0(980)$		$(1.4 \pm 0.5) \times 10^{-4}$	
Γ_{68}	$\rho\eta'(958)$		$(1.05 \pm 0.18) \times 10^{-4}$	
Γ_{69}	$a_2(1320)^\pm \pi^\mp$	[b]	$< 4.3 \times 10^{-3}$	CL=90%
Γ_{70}	$K\bar{K}_2^*(1430) + \text{c.c.}$		$< 4.0 \times 10^{-3}$	CL=90%
Γ_{71}	$K_1(1270)^\pm K^\mp$		$< 3.0 \times 10^{-3}$	CL=90%
Γ_{72}	$K_2^*(1430)^0 \bar{K}_2^*(1430)^0$		$< 2.9 \times 10^{-3}$	CL=90%
Γ_{73}	$\phi\pi^0$		$< 6.4 \times 10^{-6}$	CL=90%
Γ_{74}	$\phi\eta(1405) \rightarrow \phi\eta\pi\pi$		$< 2.5 \times 10^{-4}$	CL=90%
Γ_{75}	$\omega f_2'(1525)$		$< 2.2 \times 10^{-4}$	CL=90%
Γ_{76}	$\omega X(1835) \rightarrow \omega\rho\bar{p}$		$< 3.9 \times 10^{-6}$	CL=95%
Γ_{77}	$\eta\phi(2170) \rightarrow$ $\eta K^*(892)^0 \bar{K}^*(892)^0$		$< 2.52 \times 10^{-4}$	CL=90%

Γ_{78}	$\Sigma(1385)^0 \bar{\Lambda} + \text{c.c.}$	< 8.2	$\times 10^{-6}$	CL=90%
Γ_{79}	$\Delta(1232)^+ \bar{p}$	< 1	$\times 10^{-4}$	CL=90%
Γ_{80}	$\Lambda(1520) \bar{\Lambda} + \text{c.c.} \rightarrow \gamma \Lambda \bar{\Lambda}$	< 4.1	$\times 10^{-6}$	CL=90%
Γ_{81}	$\Theta(1540) \bar{\Theta}(1540) \rightarrow$ $K_S^0 p K^- \bar{n} + \text{c.c.}$	< 1.1	$\times 10^{-5}$	CL=90%
Γ_{82}	$\Theta(1540) K^- \bar{n} \rightarrow K_S^0 p K^- \bar{n}$	< 2.1	$\times 10^{-5}$	CL=90%
Γ_{83}	$\Theta(1540) K_S^0 \bar{p} \rightarrow K_S^0 \bar{p} K^+ n$	< 1.6	$\times 10^{-5}$	CL=90%
Γ_{84}	$\bar{\Theta}(1540) K^+ n \rightarrow K_S^0 \bar{p} K^+ n$	< 5.6	$\times 10^{-5}$	CL=90%
Γ_{85}	$\bar{\Theta}(1540) K_S^0 p \rightarrow K_S^0 p K^- \bar{n}$	< 1.1	$\times 10^{-5}$	CL=90%
Γ_{86}	$\Sigma^0 \bar{\Lambda}$	< 9	$\times 10^{-5}$	CL=90%

Decays into stable hadrons

Γ_{87}	$2(\pi^+ \pi^-) \pi^0$	(4.1 \pm 0.5) %	S=2.4
Γ_{88}	$3(\pi^+ \pi^-) \pi^0$	(2.9 \pm 0.6) %	
Γ_{89}	$\pi^+ \pi^- \pi^0$	(2.11 \pm 0.07) %	S=1.5
Γ_{90}	$\pi^+ \pi^- \pi^0 K^+ K^-$	(1.79 \pm 0.29) %	S=2.2
Γ_{91}	$4(\pi^+ \pi^-) \pi^0$	(9.0 \pm 3.0) $\times 10^{-3}$	
Γ_{92}	$\pi^+ \pi^- K^+ K^-$	(6.6 \pm 0.5) $\times 10^{-3}$	
Γ_{93}	$\pi^+ \pi^- K^+ K^- \eta$	(1.84 \pm 0.28) $\times 10^{-3}$	
Γ_{94}	$\pi^0 \pi^0 K^+ K^-$	(2.45 \pm 0.31) $\times 10^{-3}$	
Γ_{95}	$K \bar{K} \pi$	(6.1 \pm 1.0) $\times 10^{-3}$	
Γ_{96}	$2(\pi^+ \pi^-)$	(3.57 \pm 0.30) $\times 10^{-3}$	
Γ_{97}	$3(\pi^+ \pi^-)$	(4.3 \pm 0.4) $\times 10^{-3}$	
Γ_{98}	$2(\pi^+ \pi^- \pi^0)$	(1.62 \pm 0.21) %	
Γ_{99}	$2(\pi^+ \pi^-) \eta$	(2.29 \pm 0.24) $\times 10^{-3}$	
Γ_{100}	$3(\pi^+ \pi^-) \eta$	(7.2 \pm 1.5) $\times 10^{-4}$	
Γ_{101}	$\rho \bar{p}$	(2.120 \pm 0.029) $\times 10^{-3}$	
Γ_{102}	$\rho \bar{p} \pi^0$	(1.19 \pm 0.08) $\times 10^{-3}$	S=1.1
Γ_{103}	$\rho \bar{p} \pi^+ \pi^-$	(6.0 \pm 0.5) $\times 10^{-3}$	S=1.3
Γ_{104}	$\rho \bar{p} \pi^+ \pi^- \pi^0$	[c] (2.3 \pm 0.9) $\times 10^{-3}$	S=1.9
Γ_{105}	$\rho \bar{p} \eta$	(2.00 \pm 0.12) $\times 10^{-3}$	
Γ_{106}	$\rho \bar{p} \rho$	< 3.1	$\times 10^{-4}$ CL=90%
Γ_{107}	$\rho \bar{p} \omega$	(9.8 \pm 1.0) $\times 10^{-4}$	S=1.3
Γ_{108}	$\rho \bar{p} \eta'(958)$	(2.1 \pm 0.4) $\times 10^{-4}$	
Γ_{109}	$\rho \bar{p} a_0(980) \rightarrow \rho \bar{p} \pi^0 \eta$	(6.8 \pm 1.8) $\times 10^{-5}$	
Γ_{110}	$\rho \bar{p} \phi$	(4.5 \pm 1.5) $\times 10^{-5}$	
Γ_{111}	$n \bar{n}$	(2.09 \pm 0.16) $\times 10^{-3}$	
Γ_{112}	$n \bar{n} \pi^+ \pi^-$	(4 \pm 4) $\times 10^{-3}$	
Γ_{113}	$\Sigma^+ \bar{\Sigma}^-$	(1.50 \pm 0.24) $\times 10^{-3}$	
Γ_{114}	$\Sigma^0 \bar{\Sigma}^0$	(1.29 \pm 0.09) $\times 10^{-3}$	
Γ_{115}	$2(\pi^+ \pi^-) K^+ K^-$	(4.7 \pm 0.7) $\times 10^{-3}$	S=1.3
Γ_{116}	$\rho \bar{n} \pi^-$	(2.12 \pm 0.09) $\times 10^{-3}$	
Γ_{117}	$n N(1440)$	seen	
Γ_{118}	$n N(1520)$	seen	

Γ_{119}	$nN(1535)$	seen	
Γ_{120}	$\Xi^- \Xi^+$	$(8.6 \pm 1.1) \times 10^{-4}$	S=1.2
Γ_{121}	$\Lambda \bar{\Lambda}$	$(1.61 \pm 0.15) \times 10^{-3}$	S=1.9
Γ_{122}	$\Lambda \bar{\Sigma}^- \pi^+$ (or c.c.)	[b] $(8.3 \pm 0.7) \times 10^{-4}$	S=1.2
Γ_{123}	$p K^- \bar{\Lambda}$	$(8.9 \pm 1.6) \times 10^{-4}$	
Γ_{124}	$2(K^+ K^-)$	$(7.6 \pm 0.9) \times 10^{-4}$	
Γ_{125}	$p K^- \bar{\Sigma}^0$	$(2.9 \pm 0.8) \times 10^{-4}$	
Γ_{126}	$K^+ K^-$	$(2.70 \pm 0.17) \times 10^{-4}$	
Γ_{127}	$K_S^0 K_L^0$	$(2.1 \pm 0.4) \times 10^{-4}$	S=3.2
Γ_{128}	$\Lambda \bar{\Lambda} \pi^+ \pi^-$	$(4.3 \pm 1.0) \times 10^{-3}$	
Γ_{129}	$\Lambda \bar{\Lambda} \eta$	$(1.62 \pm 0.17) \times 10^{-4}$	
Γ_{130}	$\Lambda \bar{\Lambda} \pi^0$	$(3.8 \pm 0.4) \times 10^{-5}$	
Γ_{131}	$\bar{\Lambda} n K_S^0 + \text{c.c.}$	$(6.5 \pm 1.1) \times 10^{-4}$	
Γ_{132}	$\pi^+ \pi^-$	$(1.47 \pm 0.14) \times 10^{-4}$	
Γ_{133}	$\Lambda \bar{\Sigma} + \text{c.c.}$	$(2.83 \pm 0.23) \times 10^{-5}$	
Γ_{134}	$K_S^0 K_S^0$	$< 1 \times 10^{-6}$	CL=95%

Radiative decays

Γ_{135}	3γ	$(1.16 \pm 0.22) \times 10^{-5}$	
Γ_{136}	4γ	$< 9 \times 10^{-6}$	CL=90%
Γ_{137}	5γ	$< 1.5 \times 10^{-5}$	CL=90%
Γ_{138}	$\gamma \eta_c(1S)$	$(1.7 \pm 0.4) \%$	S=1.6
Γ_{139}	$\gamma \eta_c(1S) \rightarrow 3\gamma$	$(3.8 \begin{smallmatrix} +1.3 \\ -1.0 \end{smallmatrix}) \times 10^{-6}$	S=1.1
Γ_{140}	$\gamma \pi^+ \pi^- 2\pi^0$	$(8.3 \pm 3.1) \times 10^{-3}$	
Γ_{141}	$\gamma \eta \pi \pi$	$(6.1 \pm 1.0) \times 10^{-3}$	
Γ_{142}	$\gamma \eta_2(1870) \rightarrow \gamma \eta \pi^+ \pi^-$	$(6.2 \pm 2.4) \times 10^{-4}$	
Γ_{143}	$\gamma \eta(1405/1475) \rightarrow \gamma K \bar{K} \pi$	[d] $(2.8 \pm 0.6) \times 10^{-3}$	S=1.6
Γ_{144}	$\gamma \eta(1405/1475) \rightarrow \gamma \gamma \rho^0$	$(7.8 \pm 2.0) \times 10^{-5}$	S=1.8
Γ_{145}	$\gamma \eta(1405/1475) \rightarrow \gamma \eta \pi^+ \pi^-$	$(3.0 \pm 0.5) \times 10^{-4}$	
Γ_{146}	$\gamma \eta(1405/1475) \rightarrow \gamma \gamma \phi$	$< 8.2 \times 10^{-5}$	CL=95%
Γ_{147}	$\gamma \rho \rho$	$(4.5 \pm 0.8) \times 10^{-3}$	
Γ_{148}	$\gamma \rho \omega$	$< 5.4 \times 10^{-4}$	CL=90%
Γ_{149}	$\gamma \rho \phi$	$< 8.8 \times 10^{-5}$	CL=90%
Γ_{150}	$\gamma \eta'(958)$	$(5.15 \pm 0.16) \times 10^{-3}$	S=1.2
Γ_{151}	$\gamma 2\pi^+ 2\pi^-$	$(2.8 \pm 0.5) \times 10^{-3}$	S=1.9
Γ_{152}	$\gamma f_2(1270) f_2(1270)$	$(9.5 \pm 1.7) \times 10^{-4}$	
Γ_{153}	$\gamma f_2(1270) f_2(1270)$ (non resonant)	$(8.2 \pm 1.9) \times 10^{-4}$	
Γ_{154}	$\gamma K^+ K^- \pi^+ \pi^-$	$(2.1 \pm 0.6) \times 10^{-3}$	
Γ_{155}	$\gamma f_4(2050)$	$(2.7 \pm 0.7) \times 10^{-3}$	
Γ_{156}	$\gamma \omega \omega$	$(1.61 \pm 0.33) \times 10^{-3}$	
Γ_{157}	$\gamma \eta(1405/1475) \rightarrow \gamma \rho^0 \rho^0$	$(1.7 \pm 0.4) \times 10^{-3}$	S=1.3
Γ_{158}	$\gamma f_2(1270)$	$(1.43 \pm 0.11) \times 10^{-3}$	

Γ_{159}	$\gamma f_0(1710) \rightarrow \gamma K \bar{K}$	$(8.5 \begin{smallmatrix} +1.2 \\ -0.9 \end{smallmatrix}) \times 10^{-4}$	S=1.2
Γ_{160}	$\gamma f_0(1710) \rightarrow \gamma \pi \pi$	$(4.0 \pm 1.0) \times 10^{-4}$	
Γ_{161}	$\gamma f_0(1710) \rightarrow \gamma \omega \omega$	$(3.1 \pm 1.0) \times 10^{-4}$	
Γ_{162}	$\gamma f_0(1710) \rightarrow \gamma \eta \eta$	$(2.4 \begin{smallmatrix} +1.2 \\ -0.7 \end{smallmatrix}) \times 10^{-4}$	
Γ_{163}	$\gamma \eta$	$(1.104 \pm 0.034) \times 10^{-3}$	
Γ_{164}	$\gamma f_1(1420) \rightarrow \gamma K \bar{K} \pi$	$(7.9 \pm 1.3) \times 10^{-4}$	
Γ_{165}	$\gamma f_1(1285)$	$(6.1 \pm 0.8) \times 10^{-4}$	
Γ_{166}	$\gamma f_1(1510) \rightarrow \gamma \eta \pi^+ \pi^-$	$(4.5 \pm 1.2) \times 10^{-4}$	
Γ_{167}	$\gamma f_2'(1525)$	$(4.5 \begin{smallmatrix} +0.7 \\ -0.4 \end{smallmatrix}) \times 10^{-4}$	
Γ_{168}	$\gamma f_2'(1525) \rightarrow \gamma \eta \eta$	$(3.4 \pm 1.4) \times 10^{-5}$	
Γ_{169}	$\gamma f_2(1640) \rightarrow \gamma \omega \omega$	$(2.8 \pm 1.8) \times 10^{-4}$	
Γ_{170}	$\gamma f_2(1910) \rightarrow \gamma \omega \omega$	$(2.0 \pm 1.4) \times 10^{-4}$	
Γ_{171}	$\gamma f_0(1800) \rightarrow \gamma \omega \phi$	$(2.5 \pm 0.6) \times 10^{-4}$	
Γ_{172}	$\gamma f_2(1810) \rightarrow \gamma \eta \eta$	$(5.4 \begin{smallmatrix} +3.5 \\ -2.4 \end{smallmatrix}) \times 10^{-5}$	
Γ_{173}	$\gamma f_2(1950) \rightarrow$ $\gamma K^*(892) \bar{K}^*(892)$	$(7.0 \pm 2.2) \times 10^{-4}$	
Γ_{174}	$\gamma K^*(892) \bar{K}^*(892)$	$(4.0 \pm 1.3) \times 10^{-3}$	
Γ_{175}	$\gamma \phi \phi$	$(4.0 \pm 1.2) \times 10^{-4}$	S=2.1
Γ_{176}	$\gamma p \bar{p}$	$(3.8 \pm 1.0) \times 10^{-4}$	
Γ_{177}	$\gamma \eta(2225)$	$(3.3 \pm 0.5) \times 10^{-4}$	
Γ_{178}	$\gamma \eta(1760) \rightarrow \gamma \rho^0 \rho^0$	$(1.3 \pm 0.9) \times 10^{-4}$	
Γ_{179}	$\gamma \eta(1760) \rightarrow \gamma \omega \omega$	$(1.98 \pm 0.33) \times 10^{-3}$	
Γ_{180}	$\gamma X(1835) \rightarrow \gamma \pi^+ \pi^- \eta'$	$(2.6 \pm 0.4) \times 10^{-4}$	
Γ_{181}	$\gamma X(1835) \rightarrow \gamma p \bar{p}$	$(7.7 \begin{smallmatrix} +1.5 \\ -0.9 \end{smallmatrix}) \times 10^{-5}$	
Γ_{182}	$\gamma X(1840) \rightarrow \gamma 3(\pi^+ \pi^-)$	$(2.4 \begin{smallmatrix} +0.7 \\ -0.8 \end{smallmatrix}) \times 10^{-5}$	
Γ_{183}	$\gamma (K \bar{K} \pi) [J^{PC} = 0^{-+}]$	$(7 \pm 4) \times 10^{-4}$	S=2.1
Γ_{184}	$\gamma \pi^0$	$(3.49 \begin{smallmatrix} +0.33 \\ -0.30 \end{smallmatrix}) \times 10^{-5}$	
Γ_{185}	$\gamma p \bar{p} \pi^+ \pi^-$	$< 7.9 \times 10^{-4}$	CL=90%
Γ_{186}	$\gamma \Lambda \bar{\Lambda}$	$< 1.3 \times 10^{-4}$	CL=90%
Γ_{187}	$\gamma f_0(2100) \rightarrow \gamma \eta \eta$	$(1.13 \begin{smallmatrix} +0.60 \\ -0.30 \end{smallmatrix}) \times 10^{-4}$	
Γ_{188}	$\gamma f_0(2200)$		
Γ_{189}	$\gamma f_J(2220)$	$> 2.50 \times 10^{-3}$	CL=99.9%
Γ_{190}	$\gamma f_J(2220) \rightarrow \gamma \pi \pi$	$(8 \pm 4) \times 10^{-5}$	
Γ_{191}	$\gamma f_J(2220) \rightarrow \gamma K \bar{K}$	$< 3.6 \times 10^{-5}$	
Γ_{192}	$\gamma f_J(2220) \rightarrow \gamma p \bar{p}$	$(1.5 \pm 0.8) \times 10^{-5}$	
Γ_{193}	$\gamma f_2(2340) \rightarrow \gamma \eta \eta$	$(5.6 \begin{smallmatrix} +2.4 \\ -2.2 \end{smallmatrix}) \times 10^{-5}$	
Γ_{194}	$\gamma f_0(1500) \rightarrow \gamma \pi \pi$	$(1.01 \pm 0.32) \times 10^{-4}$	

Γ_{195}	$\gamma f_0(1500) \rightarrow \gamma \eta \eta$	$(1.7 \begin{smallmatrix} +0.6 \\ -1.4 \end{smallmatrix}) \times 10^{-5}$	
Γ_{196}	$\gamma A \rightarrow \gamma \text{invisible}$	$[e] < 6.3$	$\times 10^{-6}$ CL=90%
Γ_{197}	$\gamma A^0 \rightarrow \gamma \mu^+ \mu^-$	$[f] < 2.1$	$\times 10^{-5}$ CL=90%

Dalitz decays

Γ_{198}	$\pi^0 e^+ e^-$	$(7.6 \pm 1.4) \times 10^{-7}$	
Γ_{199}	$\eta e^+ e^-$	$(1.16 \pm 0.09) \times 10^{-5}$	
Γ_{200}	$\eta'(958) e^+ e^-$	$(5.81 \pm 0.35) \times 10^{-5}$	

Weak decays

Γ_{201}	$D^- e^+ \nu_e + \text{c.c.}$	< 1.2	$\times 10^{-5}$	CL=90%
Γ_{202}	$\bar{D}^0 e^+ e^- + \text{c.c.}$	< 1.1	$\times 10^{-5}$	CL=90%
Γ_{203}	$D_s^- e^+ \nu_e + \text{c.c.}$	< 3.6	$\times 10^{-5}$	CL=90%
Γ_{204}	$D^- \pi^+ + \text{c.c.}$	< 7.5	$\times 10^{-5}$	CL=90%
Γ_{205}	$\bar{D}^0 \bar{K}^0 + \text{c.c.}$	< 1.7	$\times 10^{-4}$	CL=90%
Γ_{206}	$\bar{D}^0 \bar{K}^{*0} + \text{c.c.}$	< 2.5	$\times 10^{-6}$	CL=90%
Γ_{207}	$D_s^- \pi^+ + \text{c.c.}$	< 1.3	$\times 10^{-4}$	CL=90%
Γ_{208}	$D_s^- \rho^+ + \text{c.c.}$	< 1.3	$\times 10^{-5}$	CL=90%

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

Γ_{209}	$\gamma \gamma$	C	< 2.7	$\times 10^{-7}$	CL=90%
Γ_{210}	$\gamma \phi$	C	< 1.4	$\times 10^{-6}$	CL=90%
Γ_{211}	$e^\pm \mu^\mp$	LF	< 1.6	$\times 10^{-7}$	CL=90%
Γ_{212}	$e^\pm \tau^\mp$	LF	< 8.3	$\times 10^{-6}$	CL=90%
Γ_{213}	$\mu^\pm \tau^\mp$	LF	< 2.0	$\times 10^{-6}$	CL=90%

Other decays

Γ_{214}	invisible	< 7	$\times 10^{-4}$	CL=90%
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[a] For $E_\gamma > 100$ MeV.

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

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

[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.

[f] For a narrow scalar or pseudoscalar A^0 with mass 0.21–3.0 GeV.

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

$\Gamma(\text{hadrons})$

Γ_1

<u>VALUE (keV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
● ● ● 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

<u>VALUE (keV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$5.55 \pm 0.14 \pm 0.02$ OUR EVALUATION				

● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
5.71 ± 0.16	13k	¹ ADAMS	06A CLEO	$e^+e^- \rightarrow \mu^+\mu^-\gamma$
5.57 ± 0.19	7.8k	¹ AUBERT	04 BABR	$e^+e^- \rightarrow \mu^+\mu^-\gamma$
5.14 ± 0.39		BAI	95B BES	e^+e^-
$5.36^{+0.29}_{-0.28}$		² HSUEH	92 RVUE	See γ mini-review
4.72 ± 0.35		ALEXANDER	89 RVUE	See γ mini-review
4.4 ± 0.6		² BRANDELIK	79C DASP	e^+e^-
4.6 ± 0.8		³ BALDINI-...	75 FRAG	e^+e^-
4.8 ± 0.6		BOYARSKI	75 MRK1	e^+e^-
4.6 ± 1.0		ESPOSITO	75B FRAM	e^+e^-

¹ Calculated by us from the reported values of $\Gamma(e^+e^-) \times B(\mu^+\mu^-)$ using $B(\mu^+\mu^-) = (5.93 \pm 0.06)\%$.

² From a simultaneous fit to e^+e^- , $\mu^+\mu^-$, and hadronic channels assuming $\Gamma(e^+e^-) = \Gamma(\mu^+\mu^-)$.

³ Assuming equal partial widths for e^+e^- and $\mu^+\mu^-$.

$\Gamma(\mu^+\mu^-)$

Γ_7

<u>VALUE (keV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
● ● ● 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^-

$\Gamma(\gamma\gamma)$

Γ_{209}

<u>VALUE (eV)</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<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.

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

VALUE (keV)	DOCUMENT ID	TECN	COMMENT
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
4 ± 0.8	¹ BALDINI-...	75	FRAG e^+e^-
3.9 ± 0.8	¹ ESPOSITO	75B	FRAM e^+e^-
¹ Data redundant with branching ratios or partial widths above.			

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

VALUE (eV)	DOCUMENT ID	TECN	COMMENT
332.3 ± 6.4 ± 4.8	ANASHIN	10	KEDR $3.097 e^+e^- \rightarrow e^+e^-$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
350 ± 20	BRANDELIK	79C	DASP e^+e^-
320 ± 70	¹ BALDINI-...	75	FRAG e^+e^-
340 ± 90	¹ ESPOSITO	75B	FRAM e^+e^-
360 ± 100	¹ FORD	75	SPEC e^+e^-
¹ Data redundant with branching ratios or partial widths above.			

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

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
334 ± 5	OUR AVERAGE			
331.8 ± 5.2 ± 6.3		ANASHIN	10	KEDR $3.097 e^+e^- \rightarrow \mu^+\mu^-$
338.4 ± 5.8 ± 7.1	13k	ADAMS	06A	CLEO $e^+e^- \rightarrow \mu^+\mu^-\gamma$
330.1 ± 7.7 ± 7.3	7.8k	AUBERT	04	BABR $e^+e^- \rightarrow \mu^+\mu^-\gamma$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
510 ± 90		DASP	75	DASP e^+e^-
380 ± 50		¹ ESPOSITO	75B	FRAM e^+e^-
¹ Data redundant with branching ratios or partial widths above.				

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

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

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

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
53.6 ± 5.0 ± 0.4	788	¹ AUBERT	07AU	BABR $10.6 e^+e^- \rightarrow \omega\pi^+\pi^-\gamma$

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

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

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
33±4±1	317 ± 23	^{1,2} AUBERT 07AK	BABR	10.6 e ⁺ e ⁻ → π ⁺ π ⁻ K ⁺ K ⁻ γ

¹ Dividing by 2/3 to take into account that B(K*⁰ → K⁺π⁻) = 2/3.

² AUBERT 07AK reports [Γ(J/ψ(1S) → K*(892)⁰ $\bar{K}_2^*(1430)^0$ + c.c.) × Γ(J/ψ(1S) → e⁺e⁻)/Γ_{total}] × [B(K₂^{*}(1430) → Kπ)] = 16.4 ± 1.1 ± 1.4 eV which we divide by our best value B(K₂^{*}(1430) → Kπ) = (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.

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

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
3.8±0.4±0.3	110 ± 14	¹ AUBERT 07AK	BABR	10.6 e ⁺ e ⁻ → π ⁺ π ⁻ K ⁺ K ⁻ γ

¹ Dividing by 2/3 to take into account that B(K*⁰ → K⁺π⁻) = 2/3.

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

VALUE (eV)	DOCUMENT ID	TECN	COMMENT
29.0±1.7±1.3	AUBERT 08s	BABR	10.6 e ⁺ e ⁻ → K ⁺ K*(892) ⁻ γ

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

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
10.96±0.85±0.70	155	AUBERT 08s	BABR	10.6 e ⁺ e ⁻ → K ⁺ K ⁻ π ⁰ γ

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

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
16.76±1.70±1.00	89	AUBERT 08s	BABR	10.6 e ⁺ e ⁻ → K _S ⁰ K [±] π [∓] γ

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

VALUE (eV)	DOCUMENT ID	TECN	COMMENT
26.6±2.5±1.5	AUBERT 08s	BABR	10.6 e ⁺ e ⁻ → K ⁰ $\bar{K}^*(892)^0$ γ

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

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
17.70±1.70±1.00	94	AUBERT 08s	BABR	10.6 e ⁺ e ⁻ → K _S ⁰ K [±] π [∓] γ

$$\Gamma(\omega K \bar{K}) \times \Gamma(e^+ e^-) / \Gamma_{\text{total}} \quad \Gamma_{35} \Gamma_5 / \Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
3.70±1.98±0.03	24	¹ AUBERT 07AU	BABR	10.6 e ⁺ e ⁻ → ωK ⁺ K ⁻ γ

¹ AUBERT 07AU reports [Γ(J/ψ(1S) → ωK \bar{K}) × Γ(J/ψ(1S) → e⁺e⁻)/Γ_{total}] × [B(ω(782) → π⁺π⁻π⁰)] = 3.3 ± 1.3 ± 1.2 eV which we divide by our best value B(ω(782) → π⁺π⁻π⁰) = (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.

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

VALUE (10^{-2} keV)	EVTS	DOCUMENT ID	TECN	COMMENT
0.96 ± 0.19 ± 0.01	35	¹ AUBERT	06D BABR	10.6 $e^+ e^- \rightarrow \phi 2(\pi^+ \pi^-) \gamma$

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

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

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
4.8 ± 0.4 OUR AVERAGE				

4.52 ± 0.48 ± 0.04	254 ± 23	¹ SHEN	09 BELL	10.6 $e^+ e^- \rightarrow K^+ K^- \pi^+ \pi^- \gamma$
5.33 ± 0.71 ± 0.05	103	² AUBERT, BE	06D BABR	10.6 $e^+ e^- \rightarrow K^+ K^- \pi^+ \pi^- \gamma$

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

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

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

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
3.15 ± 0.88 ± 0.03	23	¹ AUBERT, BE	06D BABR	10.6 $e^+ e^- \rightarrow K^+ K^- \pi^0 \pi^0 \gamma$

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

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

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
6.1 ± 2.7 ± 0.4	6	¹ AUBERT	07AU BABR	10.6 $e^+ e^- \rightarrow \phi \eta \gamma$

¹ AUBERT 07AU quotes $\Gamma_{ee}^{J/\psi} \cdot B(J/\psi \rightarrow \phi \eta) \cdot B(\phi \rightarrow K^+ K^-) \cdot B(\eta \rightarrow 3\pi) = 0.84 \pm 0.37 \pm 0.05$ eV.

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

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	¹ SHEN	09 BELL	10.6 $e^+ e^- \rightarrow K^+ K^- \pi^+ \pi^- \gamma$
1.02 ± 0.24 ± 0.01	20 ± 5	² AUBERT	07AK BABR	10.6 $e^+ e^- \rightarrow \pi^+ \pi^- K^+ K^- \gamma$

¹ Multiplied by 2/3 to take into account the $\phi\pi^+\pi^-$ mode only. Using $B(\phi \rightarrow K^+K^-) = (49.2 \pm 0.6)\%$.

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

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

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
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0.96±0.40±0.01 7.0 ± 2.8 ¹ AUBERT 07AK BABR 10.6 $e^+e^- \rightarrow \pi^0\pi^0 K^+K^-\gamma$
¹ AUBERT 07AK reports $[\Gamma(J/\psi(1S) \rightarrow \phi f_0(980) \rightarrow \phi\pi^0\pi^0) \times \Gamma(J/\psi(1S) \rightarrow e^+e^-)/\Gamma_{\text{total}}] \times [B(\phi(1020) \rightarrow K^+K^-)] = 0.47 \pm 0.19 \pm 0.05$ eV which we divide by our best value $B(\phi(1020) \rightarrow K^+K^-) = (48.9 \pm 0.5) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\eta\pi^+\pi^-) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ **$\Gamma_{64}\Gamma_5/\Gamma$**

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
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2.23±0.97±0.03 9 ¹ AUBERT 07AU BABR 10.6 $e^+e^- \rightarrow \eta\pi^+\pi^-\gamma$
¹ AUBERT 07AU reports $[\Gamma(J/\psi(1S) \rightarrow \eta\pi^+\pi^-) \times \Gamma(J/\psi(1S) \rightarrow e^+e^-)/\Gamma_{\text{total}}] \times [B(\eta \rightarrow \pi^+\pi^-\pi^0)] = 0.51 \pm 0.22 \pm 0.03$ eV which we divide by our best value $B(\eta \rightarrow \pi^+\pi^-\pi^0) = (22.92 \pm 0.28) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

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

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
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1.28±0.40±0.11 25 ± 8 ¹ AUBERT 07AK BABR 10.6 $e^+e^- \rightarrow \pi^+\pi^- K^+K^-\gamma$
¹ Dividing by $(2/3)^2$ to take twice into account that $B(K^{*0} \rightarrow K^+\pi^-) = 2/3$.

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

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
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4.05±0.73^{+0.04}_{-0.14} 44 ± 7 ^{1,2} AUBERT 07AK BABR 10.6 $e^+e^- \rightarrow \pi^+\pi^- K^+K^-\gamma$
¹ Using $B(\phi \rightarrow (K+K)^-) = (49.3 \pm 0.6)\%$.
² AUBERT 07AK reports $[\Gamma(J/\psi(1S) \rightarrow \phi f_2(1270)) \times \Gamma(J/\psi(1S) \rightarrow e^+e^-)/\Gamma_{\text{total}}] \times [B(f_2(1270) \rightarrow \pi\pi)] = 3.41 \pm 0.55 \pm 0.28$ eV which we divide by our best value $B(f_2(1270) \rightarrow \pi\pi) = (84.2^{+2.9}_{-0.9}) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(2(\pi^+\pi^-)\pi^0) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ **$\Gamma_{87}\Gamma_5/\Gamma$**

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

$\Gamma(\pi^+\pi^-\pi^0) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ **$\Gamma_{89}\Gamma_5/\Gamma$**

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

$\Gamma(\pi^+\pi^-\pi^0K^+K^-) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ $\Gamma_{90}\Gamma_5/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
107.0±4.3±6.4	768	AUBERT	07AU BABR	10.6 e ⁺ e ⁻ → K ⁺ K ⁻ π ⁺ π ⁻ π ⁰ γ

$\Gamma(\pi^+\pi^-K^+K^-) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ $\Gamma_{92}\Gamma_5/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
36.3±1.3±2.1	1586 ± 58	AUBERT	07AK BABR	10.6 e ⁺ e ⁻ → π ⁺ π ⁻ K ⁺ K ⁻ γ

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

33.6±2.7±2.7	233	¹ AUBERT	05D BABR	10.6 e ⁺ e ⁻ → K ⁺ K ⁻ π ⁺ π ⁻ γ
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¹Superseded by AUBERT 07AK.

$\Gamma(\pi^+\pi^-K^+K^-\eta) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ $\Gamma_{93}\Gamma_5/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
25.9±3.9±0.1	73	¹ AUBERT	07AU BABR	10.6 e ⁺ e ⁻ → K ⁺ K ⁻ π ⁺ π ⁻ ηγ

¹AUBERT 07AU reports [$\Gamma(J/\psi(1S) \rightarrow \pi^+\pi^-K^+K^-\eta) \times \Gamma(J/\psi(1S) \rightarrow e^+e^-)/\Gamma_{\text{total}}$] × [B(η → 2γ)] = 10.2 ± 1.3 ± 0.8 eV which we divide by our best value B(η → 2γ) = (39.41 ± 0.20) × 10⁻². Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\pi^0\pi^0K^+K^-) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ $\Gamma_{94}\Gamma_5/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
13.6±1.1±1.3	203 ± 16	AUBERT	07AK BABR	10.6 e ⁺ e ⁻ → π ⁰ π ⁰ K ⁺ K ⁻ γ

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

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
20.4±0.9±0.4		LEES	12E BABR	10.6 e ⁺ e ⁻ → 2π ⁺ 2π ⁻ γ

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

19.5±1.4±1.3	270	¹ AUBERT	05D BABR	10.6 e ⁺ e ⁻ → 2(π ⁺ π ⁻)γ
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¹Superseded by LEES 12E.

$\Gamma(3(\pi^+\pi^-)) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ $\Gamma_{97}\Gamma_5/\Gamma$

VALUE (10 ⁻² keV)	EVTS	DOCUMENT ID	TECN	COMMENT
2.37±0.16±0.14	496	AUBERT	06D BABR	10.6 e ⁺ e ⁻ → 3(π ⁺ π ⁻)γ

$\Gamma(2(\pi^+\pi^-\pi^0)) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ $\Gamma_{98}\Gamma_5/\Gamma$

VALUE (10 ⁻² keV)	EVTS	DOCUMENT ID	TECN	COMMENT
8.9±0.5±1.0	761	AUBERT	06D BABR	10.6 e ⁺ e ⁻ → 2(π ⁺ π ⁻ π ⁰)γ

$\Gamma(2(\pi^+\pi^-\eta)) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ $\Gamma_{99}\Gamma_5/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
13.1±2.4±0.1	85	¹ AUBERT	07AU BABR	10.6 e ⁺ e ⁻ → 2(π ⁺ π ⁻)ηγ

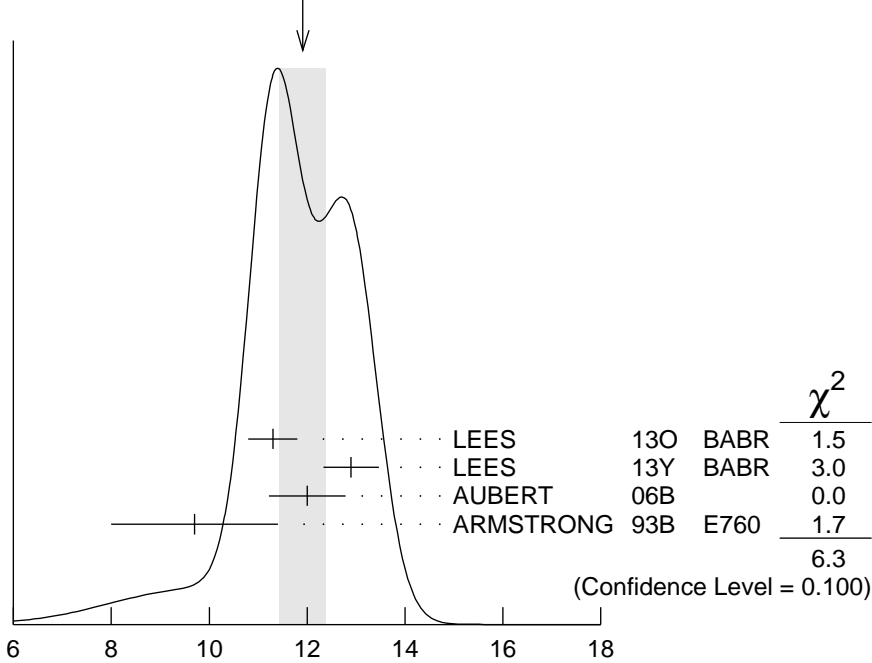
¹AUBERT 07AU reports [$\Gamma(J/\psi(1S) \rightarrow 2(\pi^+\pi^-\eta) \times \Gamma(J/\psi(1S) \rightarrow e^+e^-)/\Gamma_{\text{total}}$] × [B(η → 2γ)] = 5.16 ± 0.85 ± 0.39 eV which we divide by our best value B(η → 2γ) = (39.41 ± 0.20) × 10⁻². Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(p\bar{p}) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ **$\Gamma_{101}\Gamma_5/\Gamma$**

<u>VALUE (eV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
11.9±0.5 OUR AVERAGE		Error includes scale factor of 1.4. See the ideogram below.		
11.3±0.4±0.3	821	LEES	13O	BABR $e^+e^- \rightarrow p\bar{p}\gamma$
12.9±0.4±0.4	918	LEES	13Y	BABR $e^+e^- \rightarrow p\bar{p}\gamma$
12.0±0.6±0.5	438	AUBERT	06B	$e^+e^- \rightarrow p\bar{p}\gamma$
9.7±1.7		¹ ARMSTRONG	93B	E760 $\bar{p}p \rightarrow e^+e^-$

¹ Using $\Gamma_{\text{total}} = 85.5^{+6.1}_{-5.8}$ MeV.

WEIGHTED AVERAGE
11.9±0.5 (Error scaled by 1.4)



$\Gamma(p\bar{p}) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ (eV)

$\Gamma(\Sigma^0\bar{\Sigma}^0) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ **$\Gamma_{114}\Gamma_5/\Gamma$**

<u>VALUE (eV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
6.4±1.2±0.6	AUBERT	07BD	BABR 10.6 $e^+e^- \rightarrow \Sigma^0\bar{\Sigma}^0\gamma$

$\Gamma(2(\pi^+\pi^-)K^+K^-) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ **$\Gamma_{115}\Gamma_5/\Gamma$**

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

$\Gamma(\Lambda\bar{\Lambda}) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ **$\Gamma_{121}\Gamma_5/\Gamma$**

<u>VALUE (eV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
10.7±0.9±0.7	AUBERT	07BD	BABR 10.6 $e^+e^- \rightarrow \Lambda\bar{\Lambda}\gamma$

$\Gamma(2(K^+K^-)) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ $\Gamma_{124}\Gamma_5/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
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4.11±0.39±0.30	156 ± 15	AUBERT	07AK BABR	10.6 e ⁺ e ⁻ → 2(K ⁺ K ⁻)γ
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• • • We do not use the following data for averages, fits, limits, etc. • • •

4.0 ± 0.7 ± 0.6	38	¹ AUBERT	05D BABR	10.6 e ⁺ e ⁻ → 2(K ⁺ K ⁻)γ
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¹Superseded by AUBERT 07AK.

$\Gamma(K^+K^-) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ $\Gamma_{126}\Gamma_5/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
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1.42±0.23±0.08	51	LEES	13Q BABR	e ⁺ e ⁻ → K ⁺ K ⁻ γ
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J/ψ(1S) BRANCHING RATIOS

For the first four branching ratios, see also the partial widths, and (partial widths) × Γ(e⁺e⁻)/Γ_{total} above.

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

VALUE	DOCUMENT ID	TECN	COMMENT
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0.877±0.005 OUR AVERAGE

0.878±0.005	BAI	95B BES	e ⁺ e ⁻
0.86 ± 0.02	BOYARSKI	75 MRK1	e ⁺ e ⁻

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

VALUE	DOCUMENT ID	TECN	COMMENT
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0.135±0.003	^{1,2} SETH	04 RVUE	e ⁺ e ⁻
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• • • We do not use the following data for averages, fits, limits, etc. • • •

0.17 ± 0.02	¹ BOYARSKI	75 MRK1	e ⁺ e ⁻
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¹Included in Γ(hadrons)/Γ_{total}.

²Using B(J/ψ → ℓ⁺ℓ⁻) = (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.

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

VALUE (units 10 ⁻²)	EVTS	DOCUMENT ID	TECN	COMMENT
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64.1±1.0	6 M	¹ BESSON	08 CLEO	ψ(2S) → π ⁺ π ⁻ + hadrons
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¹Calculated using the value Γ(γγg)/Γ(ggg) = 0.137 ± 0.001 ± 0.016 ± 0.004 from BESSON 08 and the PDG 08 values of B(ℓ⁺ℓ⁻), B(virtual γ → hadrons), and B(γη_c). The statistical error is negligible and the systematic error is partially correlated with that of Γ(γγg)/Γ_{total} measurement of BESSON 08.

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

VALUE (units 10 ⁻²)	EVTS	DOCUMENT ID	TECN	COMMENT
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8.79±1.05	200 k	¹ BESSON	08 CLEO	ψ(2S) → π ⁺ π ⁻ γ + hadrons
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¹Calculated using the value Γ(γγg)/Γ(ggg) = 0.137 ± 0.001 ± 0.016 ± 0.004 from BESSON 08 and the value of Γ(ggg)/Γ_{total}. The statistical error is negligible and the systematic error is partially correlated with that of Γ(ggg)/Γ_{total} measurement of BESSON 08.

$\Gamma(\gamma g g)/\Gamma(g g g)$

Γ_4/Γ_3

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

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

Γ_5/Γ

<u>VALUE (units 10^{-2})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
5.971±0.032 OUR AVERAGE				
5.983±0.007±0.037	720k	ABLIKIM	13R	BES3 $\psi(2S) \rightarrow J/\psi \pi^+ \pi^-$
5.945±0.067±0.042	15k	LI	05C	CLEO $\psi(2S) \rightarrow J/\psi \pi^+ \pi^-$
5.90 ±0.05 ±0.10		BAI	98D	BES $\psi(2S) \rightarrow J/\psi \pi^+ \pi^-$
6.09 ±0.33		BAI	95B	BES $e^+ e^-$
5.92 ±0.15 ±0.20		COFFMAN	92	MRK3 $\psi(2S) \rightarrow J/\psi \pi^+ \pi^-$
6.9 ±0.9		BOYARSKI	75	MRK1 $e^+ e^-$

$\Gamma(e^+ e^- \gamma)/\Gamma_{\text{total}}$

Γ_6/Γ

<u>VALUE (units 10^{-3})</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
8.8±1.3±0.4	¹ ARMSTRONG	96	E760 $\bar{p} p \rightarrow e^+ e^- \gamma$

¹ For $E_\gamma > 100$ MeV.

$\Gamma(\mu^+ \mu^-)/\Gamma_{\text{total}}$

Γ_7/Γ

<u>VALUE (units 10^{-2})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
5.961±0.033 OUR AVERAGE				
5.973±0.007±0.038	770k	ABLIKIM	13R	BES3 $\psi(2S) \rightarrow J/\psi \pi^+ \pi^-$
5.960±0.065±0.050	17k	LI	05C	CLEO $\psi(2S) \rightarrow J/\psi \pi^+ \pi^-$
5.84 ±0.06 ±0.10		BAI	98D	BES $\psi(2S) \rightarrow J/\psi \pi^+ \pi^-$
6.08 ±0.33		BAI	95B	BES $e^+ e^-$
5.90 ±0.15 ±0.19		COFFMAN	92	MRK3 $\psi(2S) \rightarrow J/\psi \pi^+ \pi^-$
6.9 ±0.9		BOYARSKI	75	MRK1 $e^+ e^-$

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

Γ_5/Γ_7

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
1.0016±0.0031 OUR AVERAGE			
1.0022±0.0044±0.0048	¹ AULCHENKO	14	KEDR $3.097 e^+ e^- \rightarrow e^+ e^-, \mu^+ \mu^-$
1.0017±0.0017±0.0033	² ABLIKIM	13R	BES3 $\psi(2S) \rightarrow J/\psi \pi^+ \pi^-$
1.002 ±0.021 ±0.013	³ ANASHIN	10	KEDR $3.097 e^+ e^- \rightarrow e^+ e^-, \mu^+ \mu^-$
0.997 ±0.012 ±0.006	LI	05C	CLEO $\psi(2S) \rightarrow J/\psi \pi^+ \pi^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
1.011 ±0.013 ±0.016	BAI	98D	BES $\psi(2S) \rightarrow J/\psi \pi^+ \pi^-$
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 $e^+ e^-$

¹ From 235.3k $J/\psi \rightarrow e^+ e^-$ and 156.6k $J/\psi \rightarrow \mu^+ \mu^-$ observed events.

² Not independent of the corresponding measurements of $\Gamma(e^+ e^-)/\Gamma_{\text{total}}$ and $\Gamma(\mu^+ \mu^-)/\Gamma_{\text{total}}$.

³ Not independent of the corresponding measurements of $\Gamma(e^+ e^-) \times \Gamma(e^+ e^-)/\Gamma_{\text{total}}$ and $\Gamma(\mu^+ \mu^-) \times \Gamma(e^+ e^-)/\Gamma_{\text{total}}$.

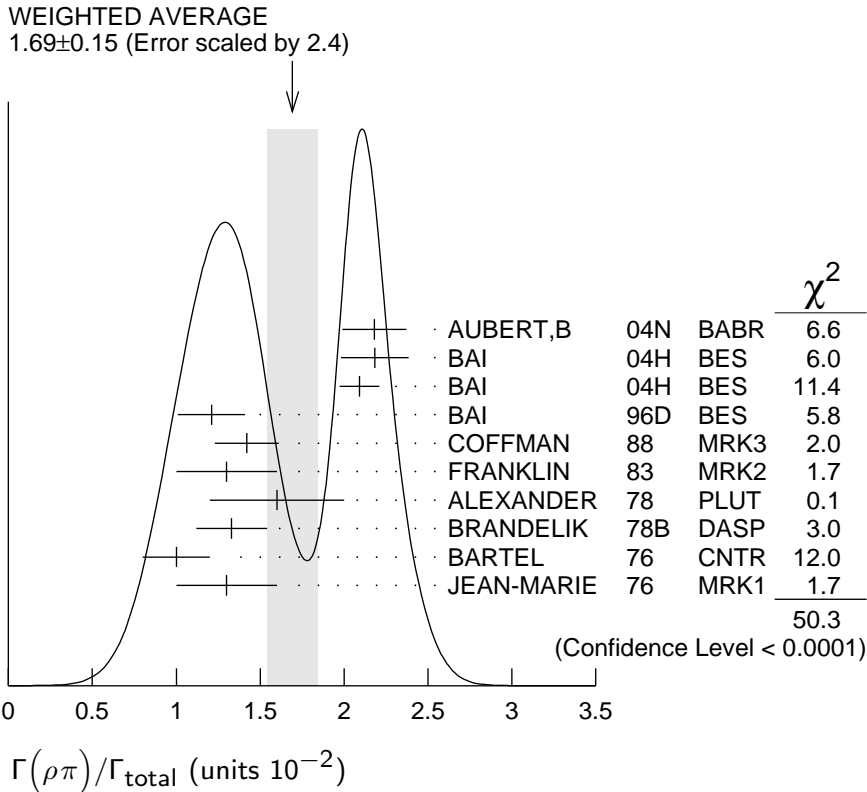
————— HADRONIC DECAYS —————

$\Gamma(\rho\pi)/\Gamma_{\text{total}}$

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		1,2 AUBERT,B	04N BABR	$10.6 e^+ e^- \rightarrow \pi^+ \pi^- \pi^0 \gamma$
2.184 ± 0.005 ± 0.201	220k	2,3 BAI	04H BES	$e^+ e^- \rightarrow J/\psi \rightarrow \pi^+ \pi^- \pi^0$
2.091 ± 0.021 ± 0.116		2,4 BAI	04H BES	$\psi(2S) \rightarrow \pi^+ \pi^- J/\psi$
1.21 ± 0.20		BAI	96D BES	$e^+ e^- \rightarrow \rho\pi$
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	$e^+ e^-$

- ¹ From the ratio of $\Gamma(e^+ e^-) B(\pi^+ \pi^- \pi^0)$ and $\Gamma(e^+ e^-) B(\mu^+ \mu^-)$ (AUBERT 04).
- ² Not independent of their $B(\pi^+ \pi^- \pi^0)$.
- ³ From $J/\psi \rightarrow \pi^+ \pi^- \pi^0$ events directly.
- ⁴ Obtained comparing the rates for $\pi^+ \pi^- \pi^0$ and $\mu^+ \mu^-$, using J/ψ events produced via $\psi(2S) \rightarrow \pi^+ \pi^- J/\psi$ and with $B(J/\psi \rightarrow \mu^+ \mu^-) = 5.88 \pm 0.10\%$.



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

Γ_9/Γ_8

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.328±0.005±0.027	COFFMAN 88	MRK3	e^+e^-
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
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^-

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

Γ_{10}/Γ

<u>VALUE (units 10⁻³)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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	$e^+e^- \rightarrow 2(\pi^+\pi^-)\pi^0$

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

Γ_{11}/Γ

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

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

Γ_{12}/Γ

<u>VALUE (units 10⁻²)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.40±0.06±0.04	170	¹ AUBERT 06D	BABR	10.6 $e^+e^- \rightarrow \omega\pi^+\pi^-\pi^0\gamma$

¹ 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

<u>VALUE (units 10⁻³)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
8.6±0.7 OUR AVERAGE				Error includes scale factor of 1.1.
9.7±0.6±0.6	788	¹ AUBERT 07AU	BABR	10.6 $e^+e^- \rightarrow \omega\pi^+\pi^-\gamma$
7.0±1.6	18058	AUGUSTIN 89	DM2	$J/\psi \rightarrow 2(\pi^+\pi^-)\pi^0$
7.8±1.6	215	BURMESTER 77D	PLUT	e^+e^-
6.8±1.9	348	VANNUCCI 77	MRK1	$e^+e^- \rightarrow 2(\pi^+\pi^-)\pi^0$

¹ AUBERT 07AU quotes $\Gamma_{ee}^{J/\psi} \cdot B(J/\psi \rightarrow \omega\pi^+\pi^-) \cdot B(\omega \rightarrow 3\pi) = 47.8 \pm 3.1 \pm 3.2$ eV.

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

Γ_{14}/Γ

<u>VALUE (units 10⁻³)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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	$e^+e^- \rightarrow 2(\pi^+\pi^-)\pi^0$

$\Gamma(K^*(892)^0\bar{K}^*(892)^0)/\Gamma_{total}$

Γ_{15}/Γ

<u>VALUE (units 10⁻⁴)</u>	<u>CL%</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
2.3±0.7±0.1	25 ± 8	¹ AUBERT 07AK	BABR	10.6	$e^+e^- \rightarrow \pi^+\pi^-K^+K^-\gamma$
<5	90	VANNUCCI 77	MRK1		$e^+e^- \rightarrow \pi^+\pi^-K^+K^-$

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

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

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

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

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

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

<u>VALUE (units 10^{-3})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$1.15 \pm 0.13 \pm 0.22$	209	ABLIKIM	10C BES2	$J/\psi \rightarrow \eta K^+ \pi^- K^- \pi^+$

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

<u>VALUE (units 10^{-3})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
6.0 ± 0.6 OUR AVERAGE				
$5.9 \pm 0.6 \pm 0.2$	317 ± 23	^{1,2} AUBERT 07AK	BABR	$10.6 e^+ e^- \rightarrow \pi^+ \pi^- K^+ K^- \gamma$
6.7 ± 2.6	40	VANNUCCI 77	MRK1	$e^+ e^- \rightarrow \pi^+ \pi^- K^+ K^-$

¹ Using $B(K_2^*(1430)^0 \rightarrow K\pi) = (49.9 \pm 1.2)\%$.

² AUBERT 07AK reports $[\Gamma(J/\psi(1S) \rightarrow K^*(892)^0 \bar{K}_2^*(1430)^0 + \text{c.c.})/\Gamma_{\text{total}}] \times [\Gamma(J/\psi(1S) \rightarrow e^+ e^-)] = (32.9 \pm 2.3 \pm 2.7) \times 10^{-3}$ keV which we divide by our best value $\Gamma(J/\psi(1S) \rightarrow e^+ e^-) = 5.55 \pm 0.14 \pm 0.02$ keV. Our first error is their experiment's error and our second error is the systematic error from using our best value.

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

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

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

<u>VALUE (units 10^{-3})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
5.12 ± 0.30 OUR AVERAGE				
$5.2 \pm 0.4 \pm 0.1$		¹ AUBERT	08S BABR	$10.6 e^+ e^- \rightarrow K^+ K^*(892)^- \gamma$
$4.57 \pm 0.17 \pm 0.70$	2285	JOUSSET	90 DM2	$J/\psi \rightarrow \text{hadrons}$
$5.26 \pm 0.13 \pm 0.53$		COFFMAN	88 MRK3	$J/\psi \rightarrow K^\pm K_S^0 \pi^\mp, K^+ K^- \pi^0$

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

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

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

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

<u>VALUE (units 10⁻³)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
1.97 ± 0.20 ± 0.05	155	¹ AUBERT	08s BABR	10.6 $e^+ e^- \rightarrow K^+ K^- \pi^0 \gamma$

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

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

<u>VALUE (units 10⁻³)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
3.0 ± 0.4 ± 0.1	89	¹ AUBERT	08s BABR	10.6 $e^+ e^- \rightarrow K_S^0 K^\pm \pi^\mp \gamma$

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

$\Gamma(K^0 \bar{K}^*(892)^0 + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{25}/Γ

<u>VALUE (units 10⁻³)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
4.39 ± 0.31 OUR AVERAGE				

4.8 ± 0.5 ± 0.1		¹ AUBERT	08s BABR	10.6 $e^+ e^- \rightarrow K^0 \bar{K}^*(892)^0 \gamma$
3.96 ± 0.15 ± 0.60	1192	JOUSSET	90 DM2	$J/\psi \rightarrow \text{hadrons}$
4.33 ± 0.12 ± 0.45		COFFMAN	88 MRK3	$J/\psi \rightarrow K^\pm K_S^0 \pi^\mp$

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

2.7 ± 0.6	45	VANNUCCI	77	MRK1	$J/\psi \rightarrow K^\pm K_S^0 \pi^\mp$
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¹ AUBERT 08s reports $[\Gamma(J/\psi(1S) \rightarrow K^0 \bar{K}^*(892)^0 + \text{c.c.})/\Gamma_{\text{total}}] \times [\Gamma(J/\psi(1S) \rightarrow e^+ e^-)] = (26.6 \pm 2.5 \pm 1.5) \times 10^{-3}$ 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.

$\Gamma(K^0 \bar{K}^*(892)^0 + \text{c.c.})/\Gamma(K^+ K^*(892)^- + \text{c.c.})$ Γ_{25}/Γ_{22}

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.82 ± 0.05 ± 0.09	COFFMAN	88	MRK3 $J/\psi \rightarrow K \bar{K}^*(892) + \text{c.c.}$

$\Gamma(K^0 \bar{K}^*(892)^0 + c.c. \rightarrow K^0 K^\pm \pi^\mp + c.c.) / \Gamma_{\text{total}}$ Γ_{26} / Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
$3.2 \pm 0.4 \pm 0.1$	94	¹ AUBERT	08S BABR	$10.6 e^+ e^- \rightarrow K_S^0 K^\pm \pi^\mp \gamma$

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

$\Gamma(K_1(1400)^\pm K^\mp) / \Gamma_{\text{total}}$ Γ_{27} / Γ

VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
$3.8 \pm 0.8 \pm 1.2$	¹ BAI	99C BES	$e^+ e^-$

¹ Assuming $B(K_1(1400) \rightarrow K^* \pi) = 0.94 \pm 0.06$

$\Gamma(\bar{K}^*(892)^0 K^+ \pi^- + c.c.) / \Gamma_{\text{total}}$ Γ_{28} / Γ

VALUE	DOCUMENT ID	TECN	COMMENT
seen	¹ ABLIKIM	06C BES2	$J/\psi \rightarrow \bar{K}^*(892)^0 K^+ \pi^-$

¹ A $K_0^*(800)$ is observed by ABLIKIM 06C in the $K^+ \pi^-$ mass spectrum of the $\bar{K}^*(892)^0 K^+ \pi^-$ final state against the $\bar{K}^*(892)$. A corresponding branching fraction of the $J/\psi(1S)$ is not presented.

$\Gamma(\omega \pi^0 \pi^0) / \Gamma_{\text{total}}$ Γ_{29} / Γ

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

$\Gamma(b_1(1235)^\pm \pi^\mp) / \Gamma_{\text{total}}$ Γ_{30} / Γ

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

$\Gamma(\omega K^\pm K_S^0 \pi^\mp) / \Gamma_{\text{total}}$ 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	$e^+ e^- \rightarrow J/\psi$
$29.5 \pm 1.4 \pm 7.0$	879 ± 41	BECKER	87 MRK3	$e^+ e^- \rightarrow \text{hadrons}$

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

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

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

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

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

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

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

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
17.0± 3.2 OUR AVERAGE				
13.6± 5.0±1.0	24	¹ AUBERT	07AU BABR	10.6 $e^+ e^- \rightarrow \omega K^+ K^- \gamma$
19.8± 2.1±3.9		² FALVARD	88 DM2	$J/\psi \rightarrow \text{hadrons}$
16 ± 10	22	FELDMAN	77 MRK1	$e^+ e^-$

¹ AUBERT 07AU quotes $\Gamma_{ee}^{J/\psi} \cdot B(J/\psi \rightarrow \omega K^+ K^-) \cdot B(\eta \rightarrow 3\pi) = 3.3 \pm 1.3 \pm 0.2 \text{ eV}$.

² Addition of $\omega K^+ K^-$ and $\omega K^0 \bar{K}^0$ branching ratios.

$\Gamma(\omega f_0(1710) \rightarrow \omega K\bar{K})/\Gamma_{\text{total}}$ Γ_{36}/Γ

VALUE (units 10^{-4})	DOCUMENT ID	TECN	COMMENT
4.8±1.1±0.3	^{1,2} FALVARD	88 DM2	$J/\psi \rightarrow \text{hadrons}$

¹ Includes unknown branching fraction $f_0(1710) \rightarrow K\bar{K}$.

² Addition of $f_0(1710) \rightarrow K^+ K^-$ and $f_0(1710) \rightarrow K^0 \bar{K}^0$ branching ratios.

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

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
16.6±2.3 OUR AVERAGE				
17.3±3.3±1.2	35	¹ AUBERT	06D BABR	10.6 $e^+ e^- \rightarrow \phi 2(\pi^+ \pi^-) \gamma$
16.0±1.0±3.0		FALVARD	88 DM2	$J/\psi \rightarrow \text{hadrons}$

¹ Using $\Gamma(J/\psi \rightarrow e^+ e^-) = 5.52 \pm 0.14 \pm 0.04 \text{ keV}$.

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

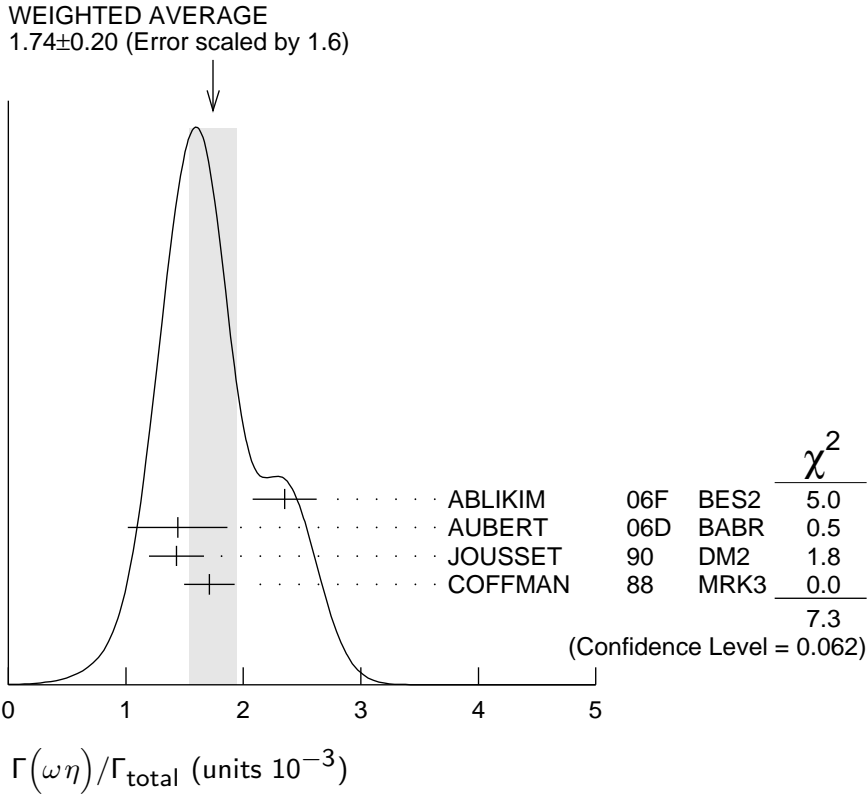
VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
1.58±0.23±0.40	332	EATON	84 MRK2	$e^+ e^-$

$\Gamma(\omega\eta)/\Gamma_{\text{total}}$ 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	¹ ABLIKIM	06F BES2	$J/\psi \rightarrow \omega\eta$
1.44 ± 0.40 ± 0.14	13	² AUBERT	06D BABR	10.6 $e^+ e^- \rightarrow \omega\eta\gamma$
1.43 ± 0.10 ± 0.21	378	JOUSSET	90 DM2	$J/\psi \rightarrow \text{hadrons}$
1.71 ± 0.08 ± 0.20		COFFMAN	88 MRK3	$e^+ e^- \rightarrow 3\pi\eta$

¹ Using $B(\eta \rightarrow 2\gamma) = (39.43 \pm 0.26)\%$, $B(\eta \rightarrow \pi^+\pi^-\pi^0) = 22.6 \pm 0.4\%$, $B(\eta \rightarrow \pi^+\pi^-\gamma) = 4.68 \pm 0.11\%$, and $B(\omega \rightarrow \pi^+\pi^-\pi^0) = (89.1 \pm 0.7)\%$.

² Using $\Gamma(J/\psi \rightarrow e^+e^-) = 5.52 \pm 0.14 \pm 0.04$ keV.



$\Gamma(\phi K \bar{K})/\Gamma_{\text{total}}$

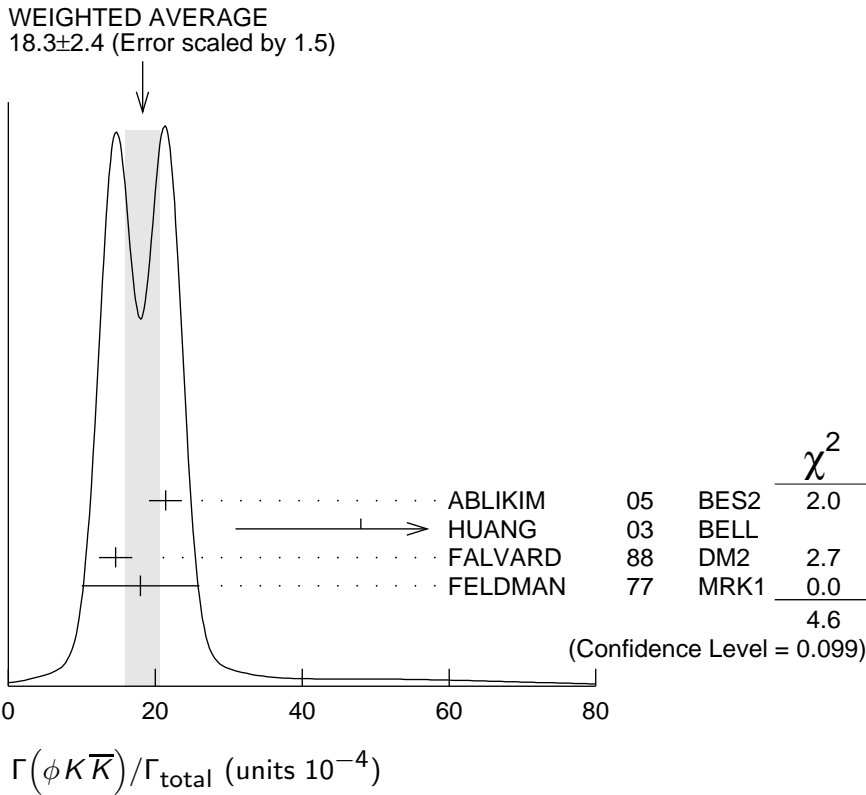
Γ_{40}/Γ

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 $J/\psi \rightarrow \phi \pi^+ \pi^-$
48 $^{+20}_{-16}$ ±6	9.0 $^{+3.7}_{-3.0}$	1,2 HUANG	03	BELL $B^+ \rightarrow (\phi K^+ K^-) K^+$
14.6± 0.8±2.1		³ FALVARD	88	DM2 $J/\psi \rightarrow$ hadrons
18 ± 8	14	FELDMAN	77	MRK1 $e^+ e^-$

¹ We have multiplied $K^+ K^-$ measurement by 2 to obtain $K \bar{K}$.

² Using $B(B^+ \rightarrow J/\psi K^+) = (1.01 \pm 0.05) \times 10^{-3}$.

³ Addition of $\phi K^+ K^-$ and $\phi K^0 \bar{K}^0$ branching ratios.



$\Gamma(\phi f_0(1710) \rightarrow \phi K \bar{K}) / \Gamma_{\text{total}}$ Γ_{41} / Γ

VALUE (units 10^{-4})	DOCUMENT ID	TECN	COMMENT
$3.6 \pm 0.2 \pm 0.6$	1,2 FALVARD	88 DM2	$J/\psi \rightarrow \text{hadrons}$

¹ Including interference with $f'_2(1525)$.
² Includes unknown branching fraction $f_0(1710) \rightarrow K \bar{K}$.

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

VALUE (units 10^{-3})	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$0.72 \pm 0.13 \pm 0.02$	44 ± 7		1,2 AUBERT	07AK BABR	$10.6 e^+ e^- \rightarrow \pi^+ \pi^- K^+ K^- \gamma$

- • • We do not use the following data for averages, fits, limits, etc. • • •
- < 0.45 90 FALVARD 88 DM2 $J/\psi \rightarrow \text{hadrons}$
- < 0.37 90 VANNUCCI 77 MRK1 $e^+ e^- \rightarrow \pi^+ \pi^- K^+ K^-$

¹ Using $B(f_2(1270) \rightarrow \pi\pi) = (84.8^{+2.4}_{-1.2})\%$
² AUBERT 07AK reports $[\Gamma(J/\psi(1S) \rightarrow \phi f_2(1270)) / \Gamma_{\text{total}}] \times [\Gamma(J/\psi(1S) \rightarrow e^+ e^-)] = (4.02 \pm 0.65 \pm 0.33) \times 10^{-3}$ keV which we divide by our best value $\Gamma(J/\psi(1S) \rightarrow e^+ e^-) = 5.55 \pm 0.14 \pm 0.02$ keV. Our first error is their experiment's error and our second error is the systematic error from using our best value.

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

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

$\Gamma(\Sigma(1385)^-\bar{\Sigma}(1385)^+(\text{or c.c.}))/\Gamma_{\text{total}}$ Γ_{44}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
1.10±0.12 OUR AVERAGE				
1.23±0.07±0.30	0.8k	ABLIKIM	12P	BES2 $J/\psi \rightarrow \Sigma(1385)^-\bar{\Sigma}(1385)^+$
1.50±0.08±0.38	1k	ABLIKIM	12P	BES2 $J/\psi \rightarrow \Sigma(1385)^+\bar{\Sigma}(1385)^-$
1.00±0.04±0.21	0.6k	HENRARD	87	DM2 $e^+e^- \rightarrow \Sigma^{*-}$
1.19±0.04±0.25	0.7k	HENRARD	87	DM2 $e^+e^- \rightarrow \Sigma^{*+}$
0.86±0.18±0.22	56	EATON	84	MRK2 $e^+e^- \rightarrow \Sigma^{*-}$
1.03±0.24±0.25	68	EATON	84	MRK2 $e^+e^- \rightarrow \Sigma^{*+}$

$\Gamma(\phi f_2'(1525))/\Gamma_{\text{total}}$ 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		^{1,2} FALVARD	88	DM2 $J/\psi \rightarrow \text{hadrons}$
4.8±1.8	46	¹ GIDAL	81	MRK2 $J/\psi \rightarrow K^+K^-K^+K^-$

¹ Re-evaluated using $B(f_2'(1525) \rightarrow K\bar{K}) = 0.713$.

² Including interference with $f_0(1710)$.

$\Gamma(\phi\pi^+\pi^-)/\Gamma_{\text{total}}$ 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	¹ AUBERT, BE 06D	BABR	10.6 $e^+e^- \rightarrow K^+K^-\pi^+\pi^-\gamma$
1.09±0.02±0.13		ABLIKIM	05	BES2 $J/\psi \rightarrow \phi\pi^+\pi^-$
0.78±0.03±0.12		FALVARD	88	DM2 $J/\psi \rightarrow \text{hadrons}$
2.1 ±0.9	23	FELDMAN	77	MRK1 e^+e^-

¹ Derived by us. AUBERT, BE 06D measures $\Gamma(J/\psi \rightarrow e^+e^-) \times B(J/\psi \rightarrow \phi\pi^+\pi^-) \times B(\phi \rightarrow K^+K^-) = (2.61 \pm 0.30 \pm 0.18) \text{ eV}$

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

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
0.56±0.16	23	¹ AUBERT, BE 06D	BABR	10.6 $e^+e^- \rightarrow K^+K^-\pi^0\pi^0\gamma$

¹ Derived by us. AUBERT, BE 06D measures $\Gamma(J/\psi \rightarrow e^+e^-) \times B(J/\psi \rightarrow \phi\pi^0\pi^0) \times B(\phi \rightarrow K^+K^-) = (1.54 \pm 0.40 \pm 0.16) \text{ eV}$

$\Gamma(\phi K^\pm K_S^0 \pi^\mp)/\Gamma_{\text{total}}$ 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 $e^+e^- \rightarrow J/\psi$
7.4±0.9±1.1		FALVARD	88	DM2 $J/\psi \rightarrow \text{hadrons}$
7 ±0.6±1.0	163 ± 15	BECKER	87	MRK3 $e^+e^- \rightarrow \text{hadrons}$

$\Gamma(\omega f_1(1420))/\Gamma_{\text{total}}$ 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 $e^+e^- \rightarrow \text{hadrons}$

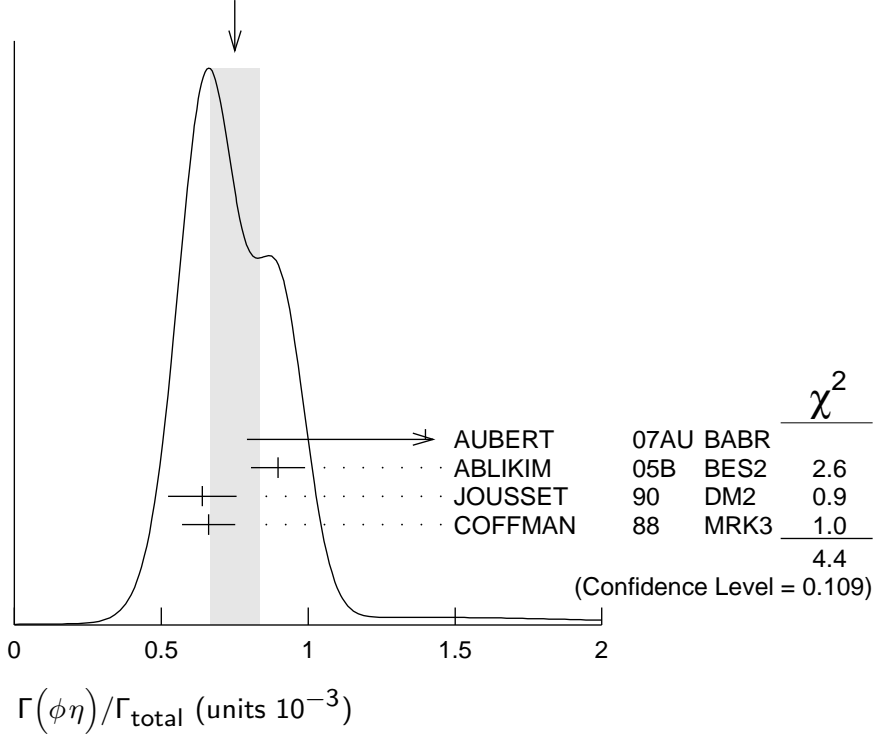
$\Gamma(\phi\eta)/\Gamma_{\text{total}}$

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	¹ AUBERT	07AU BABR	10.6 $e^+e^- \rightarrow \phi\eta\gamma$
0.898 ± 0.024 ± 0.089		ABLIKIM	05B BES2	$e^+e^- \rightarrow J/\psi \rightarrow \text{hadr}$
0.64 ± 0.04 ± 0.11	346	JOUSSET	90 DM2	$J/\psi \rightarrow \text{hadrons}$
0.661 ± 0.045 ± 0.078		COFFMAN	88 MRK3	$e^+e^- \rightarrow K^+K^-\eta$

¹ AUBERT 07AU quotes $\Gamma_{ee}^{J/\psi} \cdot B(J/\psi \rightarrow \phi\eta) \cdot B(\phi \rightarrow K^+K^-) \cdot B(\eta \rightarrow \gamma\gamma) = 0.84 \pm 0.37 \pm 0.05 \text{ eV}$.

WEIGHTED AVERAGE
0.75±0.08 (Error scaled by 1.5)



$\Gamma(\Xi^0\Xi^0)/\Gamma_{\text{total}}$

Γ_{51}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
1.20 ± 0.12 ± 0.21	206	ABLIKIM	080 BES2	$e^+e^- \rightarrow J/\psi$

$\Gamma(\Xi(1530)^-\Xi^+)/\Gamma_{\text{total}}$

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^-

$\Gamma(pK^-\Sigma(1385)^0)/\Gamma_{\text{total}}$

Γ_{53}/Γ

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

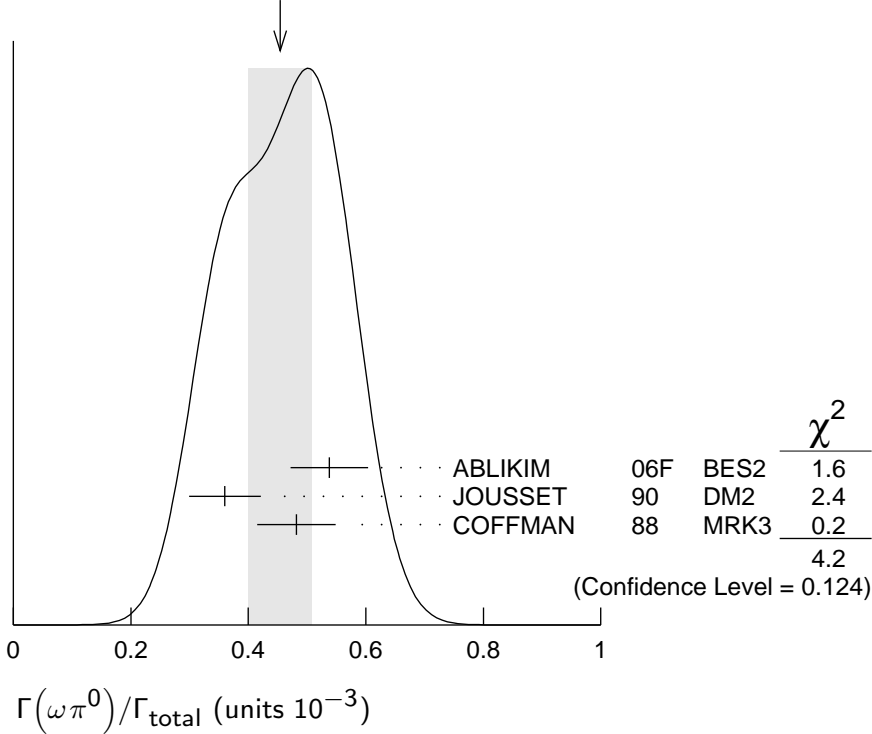
$\Gamma(\omega\pi^0)/\Gamma_{\text{total}}$

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 ± 0.012 ± 0.065	2090	¹ ABLIKIM	06F BES2	$J/\psi \rightarrow \omega\pi^0$
0.360 ± 0.028 ± 0.054	222	JOUSSET	90 DM2	$J/\psi \rightarrow \text{hadrons}$
0.482 ± 0.019 ± 0.064		COFFMAN	88 MRK3	$e^+e^- \rightarrow \pi^0\pi^+\pi^-\pi^0$

¹ Using $B(\omega \rightarrow \pi^+\pi^-\pi^0) = (89.1 \pm 0.7)\%$.

WEIGHTED AVERAGE
0.45±0.05 (Error scaled by 1.4)



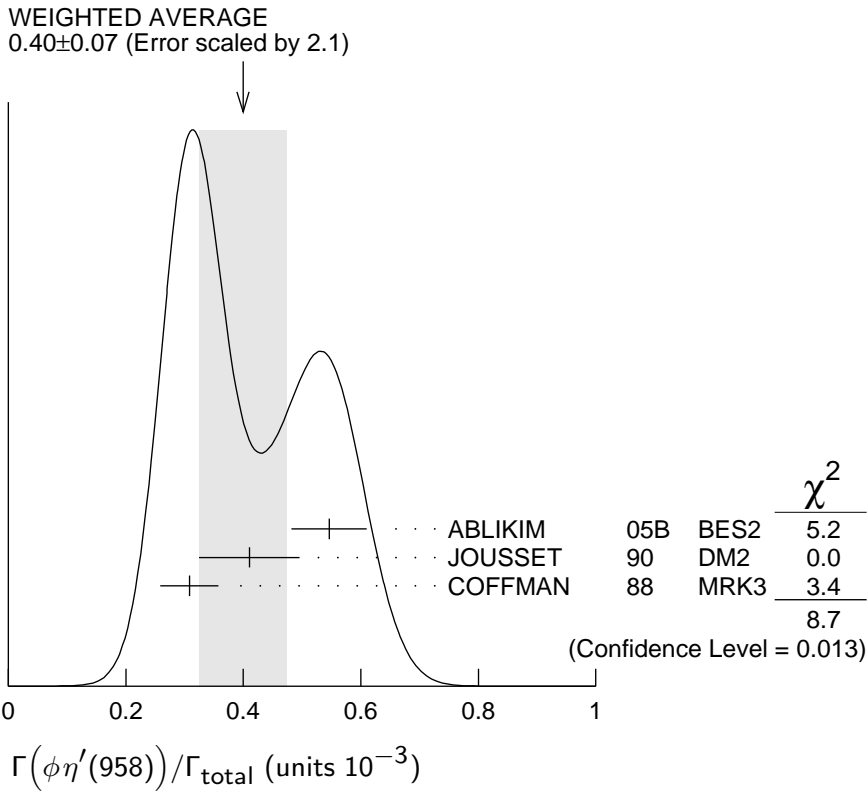
$\Gamma(\phi\eta'(958))/\Gamma_{\text{total}}$

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 ± 0.031 ± 0.056			ABLIKIM	05B BES2	$e^+e^- \rightarrow J/\psi \rightarrow \text{hadr}$
0.41 ± 0.03 ± 0.08	167		JOUSSET	90 DM2	$J/\psi \rightarrow \text{hadrons}$
0.308 ± 0.034 ± 0.036			COFFMAN	88 MRK3	$e^+e^- \rightarrow K^+K^-\eta'$

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

< 1.3	90	VANNUCCI	77 MRK1	e^+e^-
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$\Gamma(\phi f_0(980))/\Gamma_{\text{total}}$ **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.		
$4.6 \pm 0.4 \pm 0.8$		¹ FALVARD	88 DM2	$J/\psi \rightarrow \text{hadrons}$
2.6 ± 0.6	50	¹ GIDAL	81 MRK2	$J/\psi \rightarrow K^+ K^- K^+ K^-$

¹ Assuming $B(f_0(980) \rightarrow \pi\pi) = 0.78$.

$\Gamma(\phi f_0(980) \rightarrow \phi \pi^+ \pi^-)/\Gamma_{\text{total}}$ **Γ_{57}/Γ**

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
$0.182 \pm 0.042 \pm 0.005$	19.5 ± 4.5	^{1,2} AUBERT	07AK BABR	$10.6 e^+ e^- \rightarrow \pi^+ \pi^- K^+ K^- \gamma$

¹ Using $B(\phi \rightarrow K^+ K^-) = (49.3 \pm 0.6)\%$.

² AUBERT 07AK reports $[\Gamma(J/\psi(1S) \rightarrow \phi f_0(980) \rightarrow \phi \pi^+ \pi^-)/\Gamma_{\text{total}}] \times [\Gamma(J/\psi(1S) \rightarrow e^+ e^-)] = (1.01 \pm 0.22 \pm 0.08) \times 10^{-3}$ 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.

$\Gamma(\phi f_0(980) \rightarrow \phi \pi^0 \pi^0)/\Gamma_{\text{total}}$ **Γ_{58}/Γ**

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
$0.171 \pm 0.073 \pm 0.004$	7.0 ± 2.8	^{1,2} AUBERT	07AK BABR	$10.6 e^+ e^- \rightarrow \pi^0 \pi^0 K^+ K^- \gamma$

¹ Using $B(\phi \rightarrow K^+ K^-) = (49.3 \pm 0.6)\%$.

² AUBERT 07AK reports $[\Gamma(J/\psi(1S) \rightarrow \phi f_0(980) \rightarrow \phi \pi^0 \pi^0)/\Gamma_{\text{total}}] \times [\Gamma(J/\psi(1S) \rightarrow e^+ e^-)] = (0.95 \pm 0.39 \pm 0.10) \times 10^{-3}$ 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.

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

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

$\Gamma(\phi a_0(980)^0 \rightarrow \phi\eta\pi^0)/\Gamma_{\text{total}}$ Γ_{60}/Γ

<u>VALUE (units 10^{-6})</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
5.0±2.7±2.5	¹ ABLIKIM	11D	BES3 $J/\psi \rightarrow \phi\eta\pi^0$

¹ Assuming $a_0(980) - f_0(980)$ mixing and isospin breaking via γ^* and $K^* K$ loops.

$\Gamma(\Xi(1530)^0 \Xi^0)/\Gamma_{\text{total}}$ Γ_{61}/Γ

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

$\Gamma(\Sigma(1385)^- \bar{\Sigma}^+ \text{ (or c.c.)})/\Gamma_{\text{total}}$ Γ_{62}/Γ

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

$\Gamma(\phi f_1(1285))/\Gamma_{\text{total}}$ Γ_{63}/Γ

<u>VALUE (units 10^{-4})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
2.6±0.5 OUR AVERAGE	Error includes scale factor of 1.1.			
3.2±0.6±0.4		JOUSSET	90	DM2 $J/\psi \rightarrow \phi 2(\pi^+\pi^-)$
2.1±0.5±0.4	25	¹ JOUSSET	90	DM2 $J/\psi \rightarrow \phi\eta\pi^+\pi^-$
• • •	We do not use the following data for averages, fits, limits, etc. • • •			
0.6±0.2±0.1	16 ± 6	BECKER	87	MRK3 $J/\psi \rightarrow \phi K \bar{K} \pi$

¹ We attribute to the $f_1(1285)$ the signal observed in the $\pi^+\pi^-\eta$ invariant mass distribution at 1297 MeV.

$\Gamma(\eta\pi^+\pi^-)/\Gamma_{\text{total}}$ Γ_{64}/Γ

<u>VALUE (units 10^{-3})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.40±0.17±0.03	9	¹ AUBERT	07AU BABR	10.6 $e^+e^- \rightarrow \eta\pi^+\pi^-\gamma$

¹ AUBERT 07AU quotes $\Gamma_{ee}^{J/\psi} \cdot B(J/\psi \rightarrow \eta\pi^+\pi^-) \cdot B(\eta \rightarrow 3\pi) = 0.51 \pm 0.22 \pm 0.03$ eV.

$\Gamma(\rho\eta)/\Gamma_{\text{total}}$ Γ_{65}/Γ

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

$\Gamma(\omega\eta'(958))/\Gamma_{\text{total}}$ Γ_{66}/Γ

<u>VALUE (units 10^{-3})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.182±0.021 OUR AVERAGE				
0.226±0.043	218	¹ ABLIKIM	06F BES2	$J/\psi \rightarrow \omega\eta'$
0.18 $^{+0.10}_{-0.08} \pm 0.03$	6	JOUSSET	90 DM2	$J/\psi \rightarrow \text{hadrons}$
0.166±0.017±0.019		COFFMAN	88 MRK3	$e^+e^- \rightarrow 3\pi\eta'$

¹ Using $B(\eta' \rightarrow \pi^+\pi^-\eta) = (44.3 \pm 1.5)\%$, $B(\eta' \rightarrow \pi^+\pi^-\gamma) = 29.5 \pm 1.0\%$, $B(\eta \rightarrow 2\gamma) = 39.43 \pm 0.26\%$, and $B(\omega \rightarrow \pi^+\pi^-\pi^0) = (89.1 \pm 0.7)\%$.

$\Gamma(\omega f_0(980))/\Gamma_{\text{total}}$ Γ_{67}/Γ

<u>VALUE (units 10^{-4})</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
1.41±0.27±0.47	¹ AUGUSTIN	89 DM2	$J/\psi \rightarrow 2(\pi^+\pi^-)\pi^0$

¹ Assuming $B(f_0(980) \rightarrow \pi\pi) = 0.78$.

$\Gamma(\rho\eta'(958))/\Gamma_{\text{total}}$ Γ_{68}/Γ

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

$\Gamma(a_2(1320)^\pm\pi^\mp)/\Gamma_{\text{total}}$ Γ_{69}/Γ

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

$\Gamma(K\bar{K}_2^*(1430)+\text{c.c.})/\Gamma_{\text{total}}$ Γ_{70}/Γ

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

$\Gamma(K_1(1270)^\pm K^\mp)/\Gamma_{\text{total}}$ Γ_{71}/Γ

<u>VALUE (units 10^{-3})</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<3.0	90	¹ BAI	99C BES	e^+e^-

¹ Assuming $B(K_1(1270) \rightarrow K\rho)=0.42 \pm 0.06$

$\Gamma(K_2^*(1430)^0\bar{K}_2^*(1430)^0)/\Gamma_{\text{total}}$ Γ_{72}/Γ

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

$\Gamma(\phi\pi^0)/\Gamma_{\text{total}}$ Γ_{73}/Γ

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

$\Gamma(\phi\eta(1405) \rightarrow \phi\eta\pi\pi)/\Gamma_{\text{total}}$ Γ_{74}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID	TECN	COMMENT
<2.5	90	¹ FALVARD	88 DM2	$J/\psi \rightarrow \text{hadrons}$

¹ Includes unknown branching fraction $\eta(1405) \rightarrow \eta\pi\pi$.

$\Gamma(\omega f'_2(1525))/\Gamma_{\text{total}}$ Γ_{75}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID	TECN	COMMENT
<2.2	90	¹ VANNUCCI	77 MRK1	$e^+e^- \rightarrow \pi^+\pi^-\pi^0 K^+K^-$

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

<2.8	90	¹ FALVARD	88 DM2	$J/\psi \rightarrow \text{hadrons}$
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¹ Re-evaluated assuming $B(f'_2(1525) \rightarrow K\bar{K}) = 0.713$.

$\Gamma(\omega\chi(1835) \rightarrow \omega p\bar{p})/\Gamma_{\text{total}}$ Γ_{76}/Γ

VALUE (units 10^{-6})	CL%	DOCUMENT ID	TECN	COMMENT
<3.9	95	ABLIKIM	13P BES3	$J/\psi \rightarrow \gamma\pi^0 p\bar{p}$

$\Gamma(\eta\phi(2170) \rightarrow \eta K^*(892)^0 \bar{K}^*(892)^0)/\Gamma_{\text{total}}$ Γ_{77}/Γ

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

$\Gamma(\Sigma(1385)^0 \bar{\Lambda} + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{78}/Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID	TECN	COMMENT
< 0.82	90	ABLIKIM	13F BES3	$J/\psi \rightarrow p\bar{p}\pi^+\pi^-\gamma\gamma$

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

<20	90	HENRARD	87 DM2	e^+e^-
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$\Gamma(\Delta(1232)^+ \bar{p})/\Gamma_{\text{total}}$ Γ_{79}/Γ

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

$\Gamma(\Lambda(1520) \bar{\Lambda} + \text{c.c.} \rightarrow \gamma \Lambda \bar{\Lambda})/\Gamma_{\text{total}}$ Γ_{80}/Γ

VALUE (units 10^{-6})	CL%	DOCUMENT ID	TECN	COMMENT
<4.1	90	ABLIKIM	12B BES3	$J/\psi \rightarrow \Lambda \bar{\Lambda} \gamma$

$\Gamma(\Theta(1540) \bar{\Theta}(1540) \rightarrow K_S^0 p K^- \bar{n} + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{81}/Γ

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

$\Gamma(\Theta(1540) K^- \bar{n} \rightarrow K_S^0 p K^- \bar{n})/\Gamma_{\text{total}}$ Γ_{82}/Γ

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

$\Gamma(\Theta(1540) K_S^0 \bar{p} \rightarrow K_S^0 \bar{p} K^+ n)/\Gamma_{\text{total}}$ Γ_{83}/Γ

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

$\Gamma(\bar{\Theta}(1540)K^+n \rightarrow K_S^0\bar{p}K^+n)/\Gamma_{\text{total}}$ Γ_{84}/Γ

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

$\Gamma(\bar{\Theta}(1540)K_S^0p \rightarrow K_S^0pK^-\bar{n})/\Gamma_{\text{total}}$ Γ_{85}/Γ

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

$\Gamma(\Sigma^0\bar{\Lambda})/\Gamma_{\text{total}}$ Γ_{86}/Γ

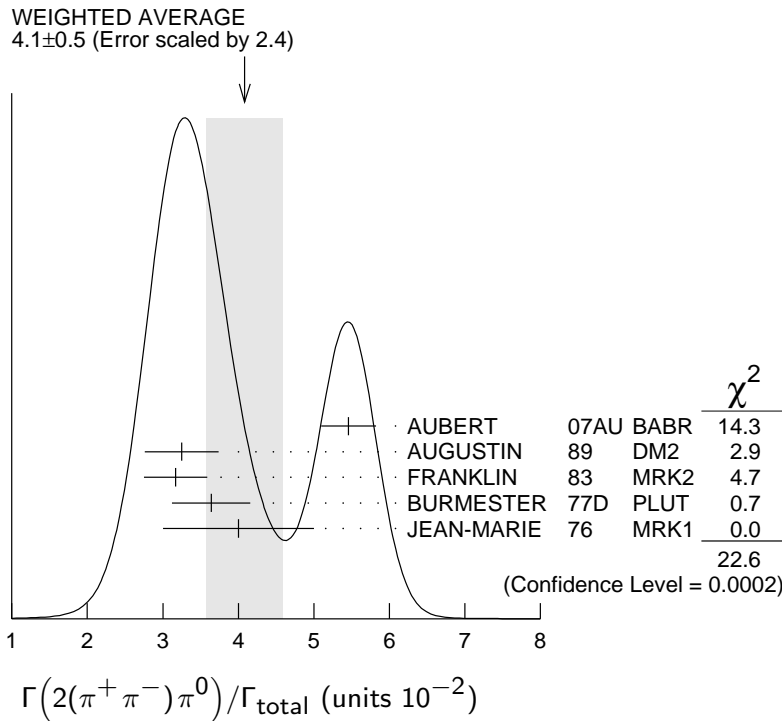
VALUE (units 10^{-4})	CL%	DOCUMENT ID	TECN	COMMENT
<0.9	90	HENRARD	87	DM2 e^+e^-

————— STABLE HADRONS —————

$\Gamma(2(\pi^+\pi^-\pi^0))/\Gamma_{\text{total}}$ Γ_{87}/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 ± 0.34 ± 0.14	4990	¹ AUBERT	07AU BABR	10.6 $e^+e^- \rightarrow 2(\pi^+\pi^-\pi^0)\gamma$
3.25 ± 0.49	46055	AUGUSTIN	89 DM2	$J/\psi \rightarrow 2(\pi^+\pi^-\pi^0)$
3.17 ± 0.42	147	FRANKLIN	83 MRK2	$e^+e^- \rightarrow \text{hadrons}$
3.64 ± 0.52	1500	BURMESTER	77D PLUT	e^+e^-
4 ± 1	675	JEAN-MARIE	76 MRK1	e^+e^-

¹AUBERT 07AU reports $[\Gamma(J/\psi(1S) \rightarrow 2(\pi^+\pi^-\pi^0))/\Gamma_{\text{total}}] \times [\Gamma(J/\psi(1S) \rightarrow e^+e^-)] = 0.303 \pm 0.005 \pm 0.018$ 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.



$\Gamma(\omega\pi^+\pi^-)/\Gamma(2(\pi^+\pi^-)\pi^0)$ Γ_{13}/Γ_{87}

VALUE DOCUMENT ID TECN COMMENT

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

0.3 ¹ JEAN-MARIE 76 MRK1 e^+e^-

¹ Final state $(\pi^+\pi^-)\pi^0$ under the assumption that $\pi\pi$ is isospin 0.

$\Gamma(3(\pi^+\pi^-)\pi^0)/\Gamma_{\text{total}}$ Γ_{88}/Γ

VALUE EVTS DOCUMENT ID TECN COMMENT

0.029±0.006 OUR AVERAGE

0.028±0.009 11 FRANKLIN 83 MRK2 $e^+e^- \rightarrow$ hadrons

0.029±0.007 181 JEAN-MARIE 76 MRK1 e^+e^-

$\Gamma(\pi^+\pi^-\pi^0)/\Gamma_{\text{total}}$ Γ_{89}/Γ

VALUE (units 10^{-3}) EVTS DOCUMENT ID TECN COMMENT

21.1 ±0.7 OUR AVERAGE Error includes scale factor of 1.5. See the ideogram below.

21.37±0.04^{+0.64}_{-0.62} 1.8M 1,2 ABLIKIM 12H BES3 $e^+e^- \rightarrow J/\psi$

22.9 ±2.0 ±0.4 256 ³ AUBERT 07AU BABR 10.6 $e^+e^- \rightarrow J/\psi\pi^+\pi^-\gamma$

21.8 ±1.9 4,5 AUBERT,B 04N BABR 10.6 $e^+e^- \rightarrow \pi^+\pi^-\pi^0\gamma$

21.84±0.05±2.01 220k 1,5 BAI 04H BES e^+e^-

20.91±0.21±1.16 5,6 BAI 04H BES e^+e^-

15 ±2 168 FRANKLIN 83 MRK2 e^+e^-

¹ From $J/\psi \rightarrow \pi^+\pi^-\pi^0$ events directly.

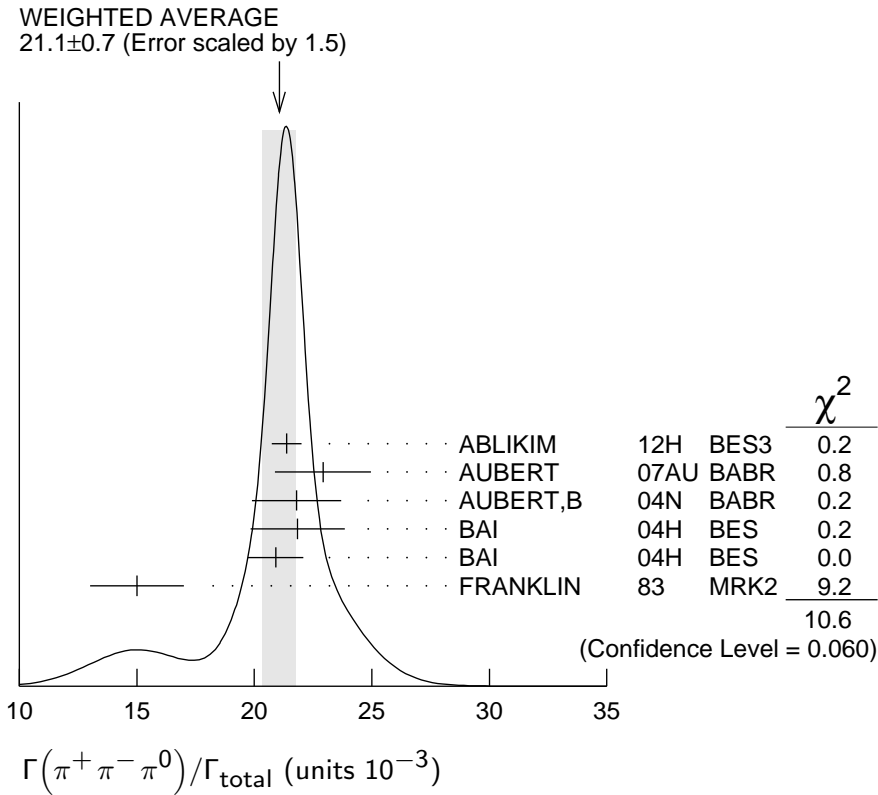
² The quoted systematic error includes a contribution of 1.23% (added in quadrature) from the uncertainty on the number of J/ψ events.

³ AUBERT 07AU reports $[\Gamma(J/\psi(1S) \rightarrow \pi^+\pi^-\pi^0)/\Gamma_{\text{total}}] \times [\Gamma(\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-) \times \Gamma(\psi(2S) \rightarrow e^+e^-)/\Gamma_{\text{total}}] = (18.6 \pm 1.2 \pm 1.1) \times 10^{-3}$ keV which we divide by our best value $\Gamma(\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-) \times \Gamma(\psi(2S) \rightarrow e^+e^-)/\Gamma_{\text{total}} = 0.811 \pm 0.013$ keV. Our first error is their experiment's error and our second error is the systematic error from using our best value.

⁴ From the ratio of $\Gamma(e^+e^-) B(\pi^+\pi^-\pi^0)$ and $\Gamma(e^+e^-) B(\mu^+\mu^-)$ (AUBERT 04).

⁵ Mostly $\rho\pi$, see also $\rho\pi$ subsection.

⁶ Obtained comparing the rates for $\pi^+\pi^-\pi^0$ and $\mu^+\mu^-$, using J/ψ events produced via $\psi(2S) \rightarrow \pi^+\pi^- J/\psi$ and with $B(J/\psi \rightarrow \mu^+\mu^-) = 5.88 \pm 0.10\%$.



$\Gamma(\pi^+ \pi^- \pi^0 K^+ K^-) / \Gamma_{\text{total}}$ **Γ_{90} / 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	¹ AUBERT	07AU BABR	10.6 $e^+ e^- \rightarrow K^+ K^- \pi^+ \pi^- \pi^0 \gamma$
1.2 ± 0.3	309	VANNUCCI	77 MRK1	$e^+ e^-$

¹ AUBERT 07AU reports $[\Gamma(J/\psi(1S) \rightarrow \pi^+ \pi^- \pi^0 K^+ K^-) / \Gamma_{\text{total}}] \times [\Gamma(J/\psi(1S) \rightarrow e^+ e^-)] = 0.1070 \pm 0.0043 \pm 0.0064$ 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.

$\Gamma(4(\pi^+ \pi^-) \pi^0) / \Gamma_{\text{total}}$ **Γ_{91} / Γ**

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

$\Gamma(\pi^+ \pi^- K^+ K^-) / \Gamma_{\text{total}}$ **Γ_{92} / Γ**

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
6.6±0.5 OUR AVERAGE				
6.5±0.4±0.2	1.6k	¹ 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	² AUBERT	05D BABR	10.6 $e^+ e^- \rightarrow K^+ K^- \pi^+ \pi^- \gamma$

¹AUBERT 07AK reports $[\Gamma(J/\psi(1S) \rightarrow \pi^+\pi^-K^+K^-)/\Gamma_{\text{total}}] \times [\Gamma(J/\psi(1S) \rightarrow e^+e^-)] = (36.3 \pm 1.3 \pm 2.1) \times 10^{-3}$ 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.

²Superseded by AUBERT 07AK. AUBERT 05D reports $[\Gamma(J/\psi(1S) \rightarrow \pi^+\pi^-K^+K^-)/\Gamma_{\text{total}}] \times [\Gamma(J/\psi(1S) \rightarrow e^+e^-)] = (33.6 \pm 2.7 \pm 2.7) \times 10^{-3}$ 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.

$\Gamma(\pi^+\pi^-K^+K^-)/\Gamma_{\text{total}}$ **Γ_{93}/Γ**

<u>VALUE (units 10^{-3})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
1.84 ± 0.28 ± 0.05	73	¹ AUBERT	07AU BABR	10.6 $e^+e^- \rightarrow K^+K^-\pi^+\pi^-\eta\gamma$

¹AUBERT 07AU reports $[\Gamma(J/\psi(1S) \rightarrow \pi^+\pi^-K^+K^-)/\Gamma_{\text{total}}] \times [\Gamma(J/\psi(1S) \rightarrow e^+e^-)] = (10.2 \pm 1.3 \pm 0.8) \times 10^{-3}$ 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.

$\Gamma(\pi^0\pi^0K^+K^-)/\Gamma_{\text{total}}$ **Γ_{94}/Γ**

<u>VALUE (units 10^{-3})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
2.45 ± 0.31 ± 0.06	203 ± 16	¹ AUBERT	07AK BABR	10.6 $e^+e^- \rightarrow \pi^0\pi^0K^+K^-\gamma$

¹AUBERT 07AK reports $[\Gamma(J/\psi(1S) \rightarrow \pi^0\pi^0K^+K^-)/\Gamma_{\text{total}}] \times [\Gamma(J/\psi(1S) \rightarrow e^+e^-)] = (13.6 \pm 1.1 \pm 1.3) \times 10^{-3}$ 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.

$\Gamma(K\bar{K}\pi)/\Gamma_{\text{total}}$ **Γ_{95}/Γ**

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

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

<u>VALUE (units 10^{-3})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
3.57 ± 0.30 OUR AVERAGE				
3.53 ± 0.12 ± 0.29	1107	¹ ABLIKIM	05H BES2	$e^+e^- \rightarrow \psi(2S) \rightarrow J/\psi \pi^+\pi^-, J/\psi \rightarrow 2(\pi^+\pi^-)$
4.0 ± 1.0	76	JEAN-MARIE	76	MRK1 e^+e^-

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

3.51 ± 0.34 ± 0.09 270 ² AUBERT 05D BABR 10.6 $e^+e^- \rightarrow 2(\pi^+\pi^-)\gamma$

¹ Computed using $B(J/\psi \rightarrow \mu^+\mu^-) = 0.0588 \pm 0.0010$.

² AUBERT 05D reports $[\Gamma(J/\psi(1S) \rightarrow 2(\pi^+\pi^-))/\Gamma_{\text{total}}] \times [\Gamma(J/\psi(1S) \rightarrow e^+e^-)] = (19.5 \pm 1.4 \pm 1.3) \times 10^{-3}$ keV which we divide by our best value $\Gamma(J/\psi(1S) \rightarrow e^+e^-) = 5.55 \pm 0.14 \pm 0.02$ keV. Our first error is their experiment's error and our second error is the systematic error from using our best value. Superseded by LEES 12E.

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

<u>VALUE (units 10^{-4})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
43 ± 4 OUR AVERAGE				
43.0 ± 2.9 ± 2.8	496	¹ AUBERT	06D BABR	10.6 $e^+e^- \rightarrow 3(\pi^+\pi^-)\gamma$
40 ± 20	32	JEAN-MARIE	76 MRK1	e^+e^-

¹ Using $\Gamma(J/\psi \rightarrow e^+e^-) = 5.52 \pm 0.14 \pm 0.04$ keV.

$\Gamma(2(\pi^+\pi^-\pi^0))/\Gamma_{\text{total}}$ Γ_{98}/Γ

<u>VALUE (units 10^{-2})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
1.62 ± 0.09 ± 0.19	761	¹ AUBERT	06D BABR	10.6 $e^+e^- \rightarrow 2(\pi^+\pi^-\pi^0)\gamma$

¹ Using $\Gamma(J/\psi \rightarrow e^+e^-) = 5.52 \pm 0.14 \pm 0.04$ keV.

$\Gamma(2(\pi^+\pi^-\eta))/\Gamma_{\text{total}}$ Γ_{99}/Γ

<u>VALUE (units 10^{-3})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
2.29 ± 0.24 OUR AVERAGE				
2.35 ± 0.39 ± 0.20	85	¹ AUBERT	07AU BABR	10.6 $e^+e^- \rightarrow 2(\pi^+\pi^-\eta)\gamma$
2.26 ± 0.08 ± 0.27	4839	ABLIKIM	05C BES2	$e^+e^- \rightarrow 2(\pi^+\pi^-\eta)$

¹ AUBERT 07AU quotes $\Gamma_{ee}^{J/\psi} \cdot B(J/\psi \rightarrow 2(\pi^+\pi^-\eta)) \cdot B(\eta \rightarrow \gamma\gamma) = 5.16 \pm 0.85 \pm 0.39$ eV.

$\Gamma(3(\pi^+\pi^-\eta))/\Gamma_{\text{total}}$ Γ_{100}/Γ

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

$\Gamma(\rho\bar{\rho})/\Gamma_{\text{total}}$ Γ_{101}/Γ

<u>VALUE (units 10^{-3})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
2.120 ± 0.029 OUR AVERAGE				
2.112 ± 0.004 ± 0.031	314k	ABLIKIM	12C BES3	e^+e^-
2.15 ± 0.16 ± 0.06	317	¹ WU	06 BELL	$B^+ \rightarrow \rho\bar{\rho}K^+$
2.26 ± 0.01 ± 0.14	63316	BAI	04E BES2	$e^+e^- \rightarrow J/\psi$
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	² 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^-
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¹ WU 06 reports $[\Gamma(J/\psi(1S) \rightarrow \rho\bar{\rho})/\Gamma_{\text{total}}] \times [B(B^+ \rightarrow J/\psi(1S)K^+)] = (2.21 \pm 0.13 \pm 0.10) \times 10^{-6}$ which we divide by our best value $B(B^+ \rightarrow J/\psi(1S)K^+) = (1.026 \pm 0.031) \times 10^{-3}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

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

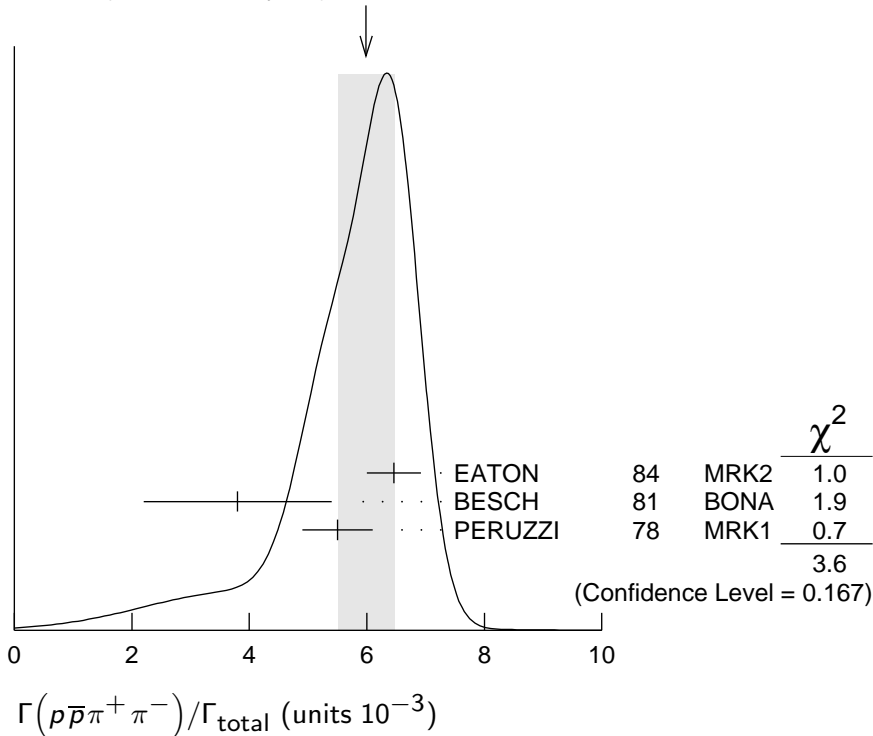
$\Gamma(\rho\bar{p}\pi^0)/\Gamma_{\text{total}}$ Γ_{102}/Γ

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^-

$\Gamma(\rho\bar{p}\pi^+\pi^-)/\Gamma_{\text{total}}$ Γ_{103}/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)



$\Gamma(\rho\bar{p}\pi^+\pi^-\pi^0)/\Gamma_{\text{total}}$ Γ_{104}/Γ

Including $\rho\bar{p}\pi^+\pi^-\gamma$ 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^-

$\Gamma(p\bar{p}\eta)/\Gamma_{\text{total}}$ Γ_{105}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
2.00±0.12 OUR AVERAGE				
1.91±0.02±0.17	13k	¹ 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^-

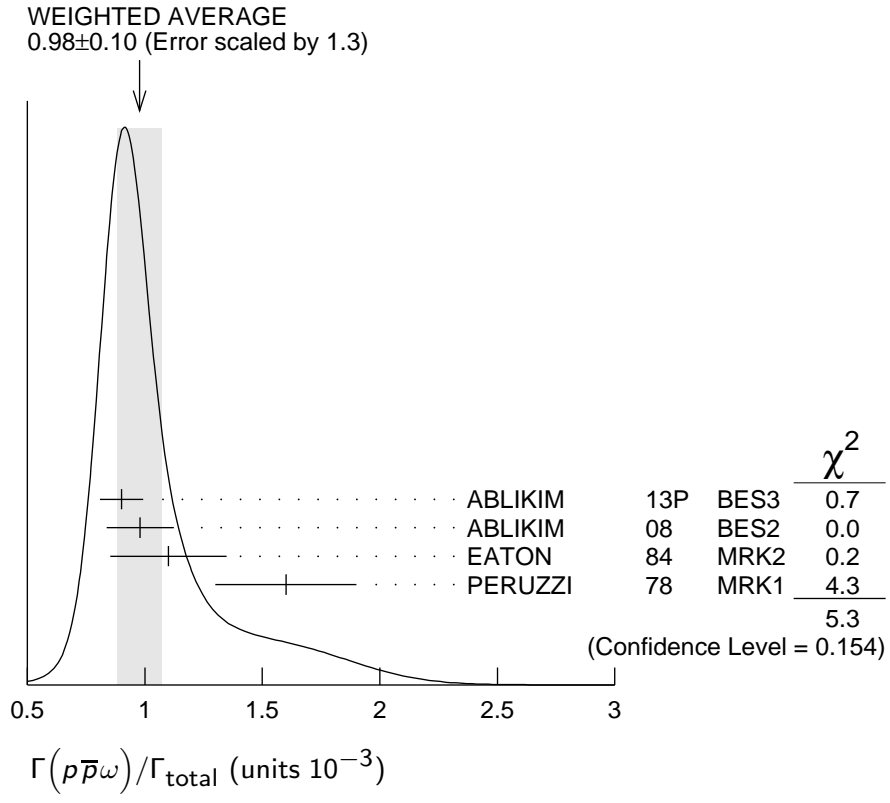
¹ From the combination of $p\bar{p}\eta \rightarrow p\bar{p}\gamma\gamma$ and $p\bar{p}\eta \rightarrow p\bar{p}\pi^+\pi^-\pi^0$ channels.

$\Gamma(p\bar{p}\rho)/\Gamma_{\text{total}}$ Γ_{106}/Γ

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

$\Gamma(p\bar{p}\omega)/\Gamma_{\text{total}}$ Γ_{107}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
0.98±0.10 OUR AVERAGE Error includes scale factor of 1.3. See the ideogram below.				
0.90±0.02±0.09	2670	ABLIKIM	13P	BES3 e^+e^-
0.98±0.03±0.14	2449	ABLIKIM	08	BES2 e^+e^-
1.10±0.17±0.18	486	EATON	84	MRK2 e^+e^-
1.6 ±0.3	77	PERUZZI	78	MRK1 e^+e^-



$\Gamma(\rho\bar{p}\eta'(958))/\Gamma_{\text{total}}$ Γ_{108}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
0.21 ± 0.04 OUR AVERAGE				
0.200 ± 0.023 ± 0.028	265 ± 31	¹ ABLIKIM	09 BES2	e^+e^-
0.68 ± 0.23 ± 0.17	19	EATON	84 MRK2	e^+e^-
1.8 ± 0.6	19	PERUZZI	78 MRK1	e^+e^-

¹From the combination of $p\bar{p}\eta' \rightarrow p\bar{p}\pi^+\pi^-\eta$ and $p\bar{p}\eta' \rightarrow p\bar{p}\gamma\rho^0$ channels.

$\Gamma(\rho\bar{p}a_0(980) \rightarrow \rho\bar{p}\pi^0\eta)/\Gamma_{\text{total}}$ Γ_{109}/Γ

VALUE (units 10^{-5})	DOCUMENT ID	TECN	COMMENT
6.8 ± 1.2 ± 1.3	ABLIKIM 14N	BES3	$e^+e^- \rightarrow J/\psi$

$\Gamma(\rho\bar{p}\phi)/\Gamma_{\text{total}}$ Γ_{110}/Γ

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

$\Gamma(n\bar{n})/\Gamma_{\text{total}}$ Γ_{111}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
2.09 ± 0.16 OUR AVERAGE				
2.07 ± 0.01 ± 0.17	36k	ABLIKIM 12C	BES3	e^+e^-
2.31 ± 0.49	79	BALDINI 98	FENI	e^+e^-
1.8 ± 0.9		BESCH 78	BONA	e^+e^-

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

1.90 ± 0.55	40	ANTONELLI 93	SPEC	e^+e^-
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$\Gamma(n\bar{n}\pi^+\pi^-)/\Gamma_{\text{total}}$ Γ_{112}/Γ

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

$\Gamma(\Sigma^+\bar{\Sigma}^-)/\Gamma_{\text{total}}$ Γ_{113}/Γ

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

$\Gamma(\Sigma^0\bar{\Sigma}^0)/\Gamma_{\text{total}}$ Γ_{114}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
1.29 ± 0.09 OUR AVERAGE				
1.15 ± 0.24 ± 0.03		¹ AUBERT 07BD	BABR	10.6 $e^+e^- \rightarrow \Sigma^0\bar{\Sigma}^0\gamma$
1.33 ± 0.04 ± 0.11	1779	ABLIKIM 06	BES2	$J/\psi \rightarrow \Sigma^0\bar{\Sigma}^0$
1.06 ± 0.04 ± 0.23	884 ± 30	PALLIN 87	DM2	$e^+e^- \rightarrow \Sigma^0\bar{\Sigma}^0$
1.58 ± 0.16 ± 0.25	90	EATON 84	MRK2	$e^+e^- \rightarrow \Sigma^0\bar{\Sigma}^0$
1.3 ± 0.4	52	PERUZZI 78	MRK1	$e^+e^- \rightarrow \Sigma^0\bar{\Sigma}^0$

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

2.4 ± 2.6	3	BESCH 81	BONA	$e^+e^- \rightarrow \Sigma^+\bar{\Sigma}^-$
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¹AUBERT 07BD reports $[\Gamma(J/\psi(1S) \rightarrow \Sigma^0\bar{\Sigma}^0)/\Gamma_{\text{total}}] \times [\Gamma(J/\psi(1S) \rightarrow e^+e^-)] = (6.4 \pm 1.2 \pm 0.6) \times 10^{-3}$ keV which we divide by our best value $\Gamma(J/\psi(1S) \rightarrow e^+e^-) = 5.55 \pm 0.14 \pm 0.02$ keV. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(2(\pi^+\pi^-)K^+K^-)/\Gamma_{\text{total}}$ Γ_{115}/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	¹ AUBERT	06D BABR	10.6 $e^+e^- \rightarrow \omega K^+K^- 2(\pi^+\pi^-)\gamma$
31 ± 13	30	VANNUCCI	77 MRK1	e^+e^-

¹ Using $\Gamma(J/\psi \rightarrow e^+e^-) = 5.52 \pm 0.14 \pm 0.04$ keV.

$\Gamma(p\bar{n}\pi^-)/\Gamma_{\text{total}}$ Γ_{116}/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	$J/\psi \rightarrow p\pi^-\bar{n}$
2.47 ± 0.02 ± 0.24	55k	ABLIKIM	06K BES2	$J/\psi \rightarrow \bar{p}\pi^+n$
2.02 ± 0.07 ± 0.16	1288	EATON	84 MRK2	$e^+e^- \rightarrow p\pi^-$
1.93 ± 0.07 ± 0.16	1191	EATON	84 MRK2	$e^+e^- \rightarrow \bar{p}\pi^+$
1.7 ± 0.7	32	BESCH	81 BONA	$e^+e^- \rightarrow p\pi^-$
1.6 ± 1.2	5	BESCH	81 BONA	$e^+e^- \rightarrow \bar{p}\pi^+$
2.16 ± 0.29	194	PERUZZI	78 MRK1	$e^+e^- \rightarrow p\pi^-$
2.04 ± 0.27	204	PERUZZI	78 MRK1	$e^+e^- \rightarrow \bar{p}\pi^+$

$\Gamma(\Xi^-\Xi^+)/\Gamma_{\text{total}}$ Γ_{120}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
0.86 ± 0.11 OUR AVERAGE		Error includes scale factor of 1.2.		
0.90 ± 0.03 ± 0.18	961 ± 35	ABLIKIM	12P BES2	$J/\psi \rightarrow \Xi^-\Xi^+$
0.70 ± 0.06 ± 0.12	132 ± 11	HENRARD	87 DM2	$e^+e^- \rightarrow \Xi^-\Xi^+$
1.14 ± 0.08 ± 0.20	194	EATON	84 MRK2	$e^+e^- \rightarrow \Xi^-\Xi^+$
1.4 ± 0.5	51	PERUZZI	78 MRK1	$e^+e^- \rightarrow \Xi^-\Xi^+$

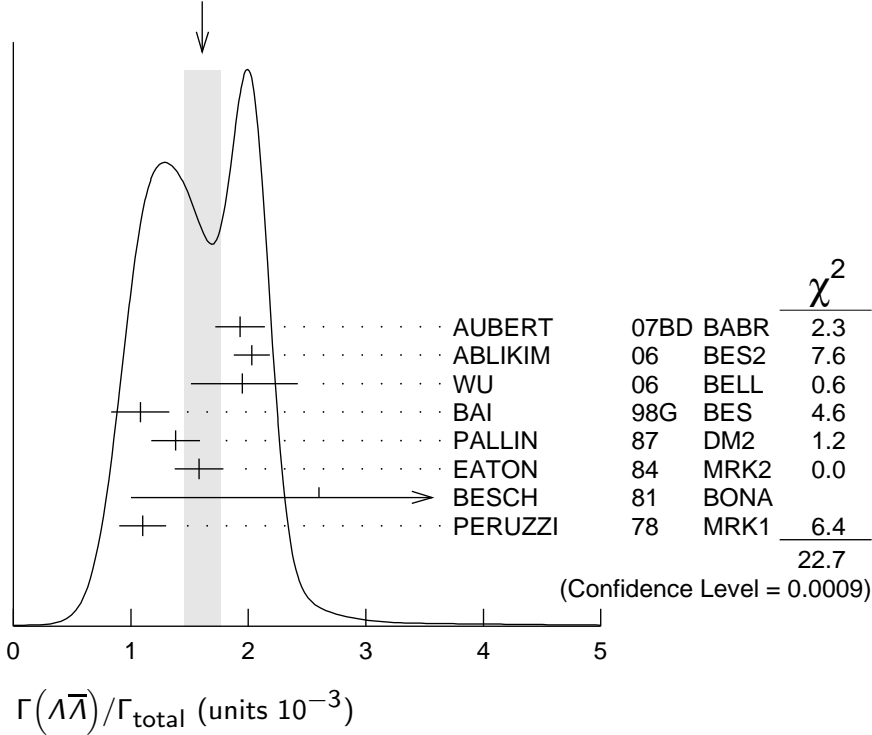
$\Gamma(\Lambda\bar{\Lambda})/\Gamma_{\text{total}}$ Γ_{121}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
1.61 ± 0.15 OUR AVERAGE		Error includes scale factor of 1.9. See the ideogram below.		
1.93 ± 0.21 ± 0.05		¹ AUBERT	07BD BABR	10.6 $e^+e^- \rightarrow \Lambda\bar{\Lambda}\gamma$
2.03 ± 0.03 ± 0.15	8887	ABLIKIM	06 BES2	$J/\psi \rightarrow \Lambda\bar{\Lambda}$
1.9 $^{+0.5}_{-0.4}$ ± 0.1	46	² WU	06 BELL	$B^+ \rightarrow \Lambda\bar{\Lambda}K^+$
1.08 ± 0.06 ± 0.24	631	BAI	98G BES	e^+e^-
1.38 ± 0.05 ± 0.20	1847	PALLIN	87 DM2	e^+e^-
1.58 ± 0.08 ± 0.19	365	EATON	84 MRK2	e^+e^-
2.6 ± 1.6	5	BESCH	81 BONA	e^+e^-
1.1 ± 0.2	196	PERUZZI	78 MRK1	e^+e^-

¹ AUBERT 07BD reports $[\Gamma(J/\psi(1S) \rightarrow \Lambda\bar{\Lambda})/\Gamma_{\text{total}}] \times [\Gamma(J/\psi(1S) \rightarrow e^+e^-)] = (10.7 \pm 0.9 \pm 0.7) \times 10^{-3}$ 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.

² WU 06 reports $[\Gamma(J/\psi(1S) \rightarrow \Lambda\bar{\Lambda})/\Gamma_{\text{total}}] \times [B(B^+ \rightarrow J/\psi(1S)K^+)] = (2.00 $^{+0.34}_{-0.29}$ ± 0.34) × 10⁻⁶ which we divide by our best value $B(B^+ \rightarrow J/\psi(1S)K^+) = (1.026 \pm 0.031) \times 10^{-3}$. 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 1.9)



$\Gamma(\Lambda\bar{\Lambda})/\Gamma(p\bar{p})$

$\Gamma_{121}/\Gamma_{101}$

VALUE	DOCUMENT ID	TECN	COMMENT
$0.90^{+0.15}_{-0.14} \pm 0.10$	¹ WU	06 BELL	$B^+ \rightarrow p\bar{p}K^+, \Lambda\bar{\Lambda}K^+$

¹ Not independent of other $J/\psi \rightarrow \Lambda\bar{\Lambda}, p\bar{p}$ branching ratios reported by WU 06.

$\Gamma(\Lambda\bar{\Sigma}^- \pi^+ \text{ (or c.c.)})/\Gamma_{\text{total}}$

Γ_{122}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
0.83 ± 0.07 OUR AVERAGE				Error includes scale factor of 1.2.
$0.770 \pm 0.051 \pm 0.083$	335	¹ ABLIKIM	07H BES2	$e^+e^- \rightarrow \bar{\Lambda}\Sigma^+\pi^-$
$0.747 \pm 0.056 \pm 0.076$	254	¹ ABLIKIM	07H BES2	$e^+e^- \rightarrow \Lambda\bar{\Sigma}^-\pi^+$
$0.90 \pm 0.06 \pm 0.16$	225 ± 15	HENRARD	87 DM2	$e^+e^- \rightarrow \bar{\Lambda}\Sigma^+\pi^-$
$1.11 \pm 0.06 \pm 0.20$	342 ± 18	HENRARD	87 DM2	$e^+e^- \rightarrow \Lambda\bar{\Sigma}^-\pi^+$
$1.53 \pm 0.17 \pm 0.38$	135	EATON	84 MRK2	$e^+e^- \rightarrow \bar{\Lambda}\Sigma^+\pi^-$
$1.38 \pm 0.21 \pm 0.35$	118	EATON	84 MRK2	$e^+e^- \rightarrow \Lambda\bar{\Sigma}^-\pi^+$

¹ Using $B(\Lambda \rightarrow \pi^- p) = 63.9\%$ and $B(\Sigma^+ \rightarrow \pi^0 p) = 51.6\%$.

$\Gamma(pK^-\bar{\Lambda})/\Gamma_{\text{total}}$

Γ_{123}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
$0.89 \pm 0.07 \pm 0.14$	307	EATON	84 MRK2	e^+e^-

$\Gamma(2(K^+ K^-))/\Gamma_{\text{total}}$ Γ_{124}/Γ

<u>VALUE (units 10^{-3})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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0.76 ± 0.09 OUR AVERAGE

0.74 ± 0.09 ± 0.02	156 ± 15	¹ AUBERT	07AK	BABR	10.6 $e^+ e^- \rightarrow 2(K^+ K^-)\gamma$
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1.4 $^{+0.5}_{-0.4} \pm 0.2$	11.0 $^{+4.3}_{-3.5}$	² HUANG	03	BELL	$B^+ \rightarrow 2(K^+ K^-) K^+$
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0.7 ± 0.3		VANNUCCI	77	MRK1	$e^+ e^-$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

0.72 ± 0.17 ± 0.02	38	³ AUBERT	05D	BABR	10.6 $e^+ e^- \rightarrow 2(K^+ K^-)\gamma$
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¹ AUBERT 07AK reports $[\Gamma(J/\psi(1S) \rightarrow 2(K^+ K^-))/\Gamma_{\text{total}}] \times [\Gamma(J/\psi(1S) \rightarrow e^+ e^-)] = (4.11 \pm 0.39 \pm 0.30) \times 10^{-3}$ keV which we divide by our best value $\Gamma(J/\psi(1S) \rightarrow e^+ e^-) = 5.55 \pm 0.14 \pm 0.02$ keV. Our first error is their experiment's error and our second error is the systematic error from using our best value.

² Using $B(B^+ \rightarrow J/\psi K^+) = (1.01 \pm 0.05) \times 10^{-3}$.

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

$\Gamma(p K^- \bar{\Sigma}^0)/\Gamma_{\text{total}}$ Γ_{125}/Γ

<u>VALUE (units 10^{-3})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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0.29 ± 0.06 ± 0.05	90	EATON	84	MRK2	$e^+ e^-$
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$\Gamma(K^+ K^-)/\Gamma_{\text{total}}$ Γ_{126}/Γ

<u>VALUE (units 10^{-4})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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2.70 ± 0.17 OUR AVERAGE

2.86 ± 0.09 ± 0.19	1k	¹ METREVELI	12		$\psi(2S) \rightarrow \pi^+ \pi^- K^+ K^-$
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2.39 ± 0.24 ± 0.22	107	BALTRUSAIT..85D	MRK3		$e^+ e^-$
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2.2 ± 0.9	6	BRANDELIK	79C	DASP	$e^+ e^-$
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¹ Obtained by analyzing CLEO-c data but not authored by the CLEO Collaboration.

$\Gamma(K_S^0 K_L^0)/\Gamma_{\text{total}}$ Γ_{127}/Γ

<u>VALUE (units 10^{-4})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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2.1 ± 0.4 OUR AVERAGE Error includes scale factor of 3.2.

2.62 ± 0.15 ± 0.14	0.3k	¹ METREVELI	12		$\psi(2S) \rightarrow \pi^+ \pi^- K_S^0 K_L^0$
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1.82 ± 0.04 ± 0.13	2.1k	² BAI	04A	BES2	$J/\psi \rightarrow K_S^0 K_L^0 \rightarrow \pi^+ \pi^- X$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

1.18 ± 0.12 ± 0.18		JOUSSET	90	DM2	$J/\psi \rightarrow$ hadrons
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1.01 ± 0.16 ± 0.09	74	BALTRUSAIT..85D	MRK3		$e^+ e^-$
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¹ Obtained by analyzing CLEO-c data but not authored by the CLEO Collaboration.

² Using $B(K_S^0 \rightarrow \pi^+ \pi^-) = 0.6868 \pm 0.0027$.

$\Gamma(\Lambda \bar{\Lambda} \pi^+ \pi^-)/\Gamma_{\text{total}}$ Γ_{128}/Γ

<u>VALUE (units 10^{-3})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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4.30 ± 0.13 ± 0.99	2.4k	ABLIKIM	12P	BES2	J/ψ
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$\Gamma(\Lambda\bar{\Lambda}\eta)/\Gamma_{\text{total}}$ Γ_{129}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT
16.2±1.7 OUR AVERAGE				
15.7±0.80±1.54	454	¹ ABLIKIM	13F BES3	$J/\psi \rightarrow p\bar{p}\pi^+\pi^-\gamma\gamma$
26.2±6.0 ±4.4	44	² ABLIKIM	07H BES2	$e^+e^- \rightarrow \psi(2S)$

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

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

$\Gamma(\Lambda\bar{\Lambda}\pi^0)/\Gamma_{\text{total}}$ Γ_{130}/Γ

VALUE (units 10^{-5})	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
3.78±0.27±0.30					
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●					
< 6.4		90	² ABLIKIM	07H BES2	$e^+e^- \rightarrow \psi(2S)$
23 ±7 ±8		11	BAI	98G BES	e^+e^-
22 ±5 ±5		19	HENRARD	87 DM2	e^+e^-

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

² Using $B(\Lambda \rightarrow \pi^- p) = 63.9\%$.

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

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
6.46±0.20±1.07				
	1058	¹ ABLIKIM	08C BES2	$e^+e^- \rightarrow J/\psi$

¹ Using $B(\bar{\Lambda} \rightarrow \bar{p}\pi^+) = 63.9\%$ and $B(K_S^0 \rightarrow \pi^+\pi^-) = 69.2\%$.

$\Gamma(\pi^+\pi^-)/\Gamma_{\text{total}}$ Γ_{132}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
1.47±0.14 OUR AVERAGE				
1.47±0.13±0.13	140	¹ METREVELI	12	$\psi(2S) \rightarrow 2(\pi^+\pi^-)$
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^-

¹ Obtained by analyzing CLEO-c data but not authored by the CLEO Collaboration.

$\Gamma(\Lambda\bar{\Sigma} + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{133}/Γ

VALUE (units 10^{-5})	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
2.83±0.23 OUR AVERAGE					
2.74±0.24±0.22		234 ± 21	¹ ABLIKIM	12B BES3	$J/\psi \rightarrow \Lambda\bar{\Sigma}^0$
2.92±0.22±0.24		308 ± 24	² ABLIKIM	12B BES3	$J/\psi \rightarrow \bar{\Lambda}\Sigma^0$

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

<15		90	PERUZZI	78 MRK1	$e^+e^- \rightarrow \Lambda X$
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¹ ABLIKIM 12B quotes $B(J/\psi \rightarrow \Lambda\bar{\Sigma}^0)$ which we multiply by 2.

² ABLIKIM 12B quotes $B(J/\psi \rightarrow \bar{\Lambda}\Sigma^0)$ which we multiply by 2.

$\Gamma(K_S^0 K_S^0)/\Gamma_{\text{total}}$ Γ_{134}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID	TECN	COMMENT
<0.01	95	¹ BAI	04D BES	e^+e^-
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
<0.052	90	¹ BALTRUSAIT..85C	MRK3	e^+e^-
¹ Forbidden by CP.				

————— RADIATIVE DECAYS —————

$\Gamma(3\gamma)/\Gamma_{\text{total}}$ Γ_{135}/Γ

VALUE (units 10^{-6})	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
11.6 ± 2.2 OUR AVERAGE					
11.3 ± 1.8 ± 2.0		113 ± 18	ABLIKIM	13I BES3	$\psi(2S) \rightarrow \pi^+\pi^- J/\psi$
12 ± 3 ± 2		24.2 ^{+7.2} _{-6.0}	ADAMS	08 CLEO	$\psi(2S) \rightarrow \pi^+\pi^- J/\psi$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●					
<55	90		PARTRIDGE	80 CBAL	e^+e^-

$\Gamma(4\gamma)/\Gamma_{\text{total}}$ Γ_{136}/Γ

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

$\Gamma(5\gamma)/\Gamma_{\text{total}}$ Γ_{137}/Γ

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

$\Gamma(\gamma\eta_c(1S))/\Gamma_{\text{total}}$ Γ_{138}/Γ

VALUE (units 10^{-2})	EVTS	DOCUMENT ID	TECN	COMMENT
1.7 ± 0.4 OUR AVERAGE Error includes scale factor of 1.6.				
2.01 ± 0.32 ± 0.02		¹ MITCHELL	09 CLEO	$e^+e^- \rightarrow \gamma X$
1.27 ± 0.36		GAISER	86 CBAL	$J/\psi \rightarrow \gamma X$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
0.79 ± 0.20	273 ± 43	² AUBERT	06E BABR	$B^\pm \rightarrow K^\pm X_{c\bar{c}}$
seen	16	BALTRUSAIT..84	MRK3	$J/\psi \rightarrow 2\phi\gamma$

¹MITCHELL 09 reports $(1.98 \pm 0.09 \pm 0.30) \times 10^{-2}$ from a measurement of $[\Gamma(J/\psi(1S) \rightarrow \gamma\eta_c(1S))/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-)]$ assuming $B(\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-) = (35.04 \pm 0.07 \pm 0.77) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-) = (34.46 \pm 0.30) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

²Calculated by the authors using an average of $B(J/\psi \rightarrow \gamma\eta_c) \times B(\eta_c \rightarrow K\bar{K}\pi)$ from BALTRUSAITIS 86, BISELLO 91, BAI 04 and $B(\eta_c \rightarrow K\bar{K}\pi) = (8.5 \pm 1.8)\%$ from AUBERT 06E.

$\Gamma(\gamma\eta_c(1S) \rightarrow 3\gamma)/\Gamma_{\text{total}}$ Γ_{139}/Γ

VALUE (units 10^{-6})	EVTS	DOCUMENT ID	TECN	COMMENT
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$3.8^{+1.3}_{-1.0}$ OUR AVERAGE Error includes scale factor of 1.1.

$4.5 \pm 1.2 \pm 0.6$	33 ± 9	ABLIKIM	13I	BES3 $\psi(2S) \rightarrow \pi^+ \pi^- J/\psi$
$1.2^{+2.7}_{-1.1} \pm 0.3$	$1.2^{+2.8}_{-1.1}$	ADAMS	08	CLEO $\psi(2S) \rightarrow \pi^+ \pi^- J/\psi$

$\Gamma(\gamma\pi^+ \pi^- 2\pi^0)/\Gamma_{\text{total}}$ Γ_{140}/Γ

VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
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$8.3 \pm 0.2 \pm 3.1$ ¹ BALTRUSAIT ..86B MRK3 $J/\psi \rightarrow 4\pi\gamma$

¹ 4π mass less than 2.0 GeV.

$\Gamma(\gamma\eta\pi\pi)/\Gamma_{\text{total}}$ Γ_{141}/Γ

VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
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6.1 ± 1.0 OUR AVERAGE

$5.85 \pm 0.3 \pm 1.05$	¹ EDWARDS	83B	CBAL $J/\psi \rightarrow \eta\pi^+\pi^-$
$7.8 \pm 1.2 \pm 2.4$	¹ EDWARDS	83B	CBAL $J/\psi \rightarrow \eta 2\pi^0$

¹ Broad enhancement at 1700 MeV.

$\Gamma(\gamma\eta_2(1870) \rightarrow \gamma\eta\pi^+\pi^-)/\Gamma_{\text{total}}$ Γ_{142}/Γ

VALUE (units 10^{-4})	DOCUMENT ID	TECN	COMMENT
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$6.2 \pm 2.2 \pm 0.9$ BAI 99 BES $J/\psi \rightarrow \gamma\eta\pi^+\pi^-$

$\Gamma(\gamma\eta(1405/1475) \rightarrow \gamma K \bar{K} \pi)/\Gamma_{\text{total}}$ Γ_{143}/Γ

VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
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2.8 ± 0.6 OUR AVERAGE Error includes scale factor of 1.6. See the ideogram below.

$1.66 \pm 0.1 \pm 0.58$	^{1,2} BAI	00D	BES $J/\psi \rightarrow \gamma K^\pm K_S^0 \pi^\mp$
$3.8 \pm 0.3 \pm 0.6$	³ AUGUSTIN	90	DM2 $J/\psi \rightarrow \gamma K \bar{K} \pi$
$4.0 \pm 0.7 \pm 1.0$	³ EDWARDS	82E	CBAL $J/\psi \rightarrow K^+ K^- \pi^0 \gamma$
4.3 ± 1.7	^{3,4} SCHARRE	80	MRK2 $e^+ e^-$

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

$1.78 \pm 0.21 \pm 0.33$	^{3,5,6} AUGUSTIN	92	DM2 $J/\psi \rightarrow \gamma K \bar{K} \pi$
$0.83 \pm 0.13 \pm 0.18$	^{3,7,8} AUGUSTIN	92	DM2 $J/\psi \rightarrow \gamma K \bar{K} \pi$
$0.66^{+0.17+0.24}_{-0.16-0.15}$	^{3,6,9} BAI	90C	MRK3 $J/\psi \rightarrow \gamma K_S^0 K^\pm \pi^\mp$
$1.03^{+0.21+0.26}_{-0.18-0.19}$	^{3,8,10} BAI	90C	MRK3 $J/\psi \rightarrow \gamma K_S^0 K^\pm \pi^\mp$

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

² Interference with $J/\psi \rightarrow \gamma f_1(1420)$ is $(-0.03 \pm 0.01 \pm 0.01) \times 10^{-3}$.

³ Includes unknown branching fraction $\eta(1405) \rightarrow K \bar{K} \pi$.

⁴ Corrected for spin-zero hypothesis for $\eta(1405)$.

⁵ From fit to the $a_0(980)\pi 0^-+$ partial wave.

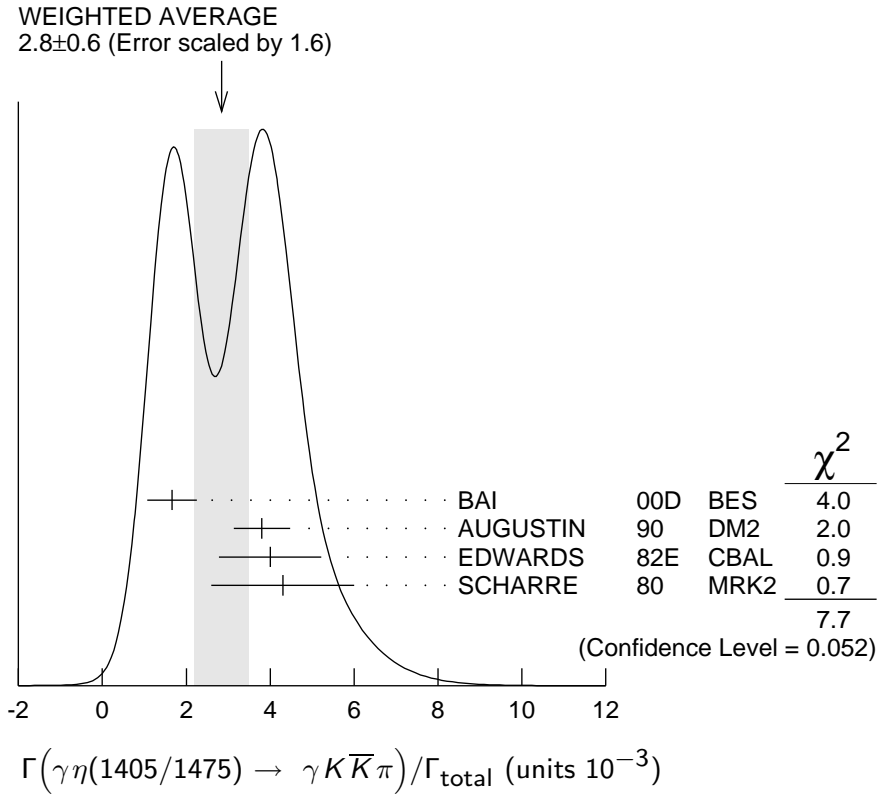
⁶ $a_0(980)\pi$ mode.

⁷ From fit to the $K^*(892)K 0^-+$ partial wave.

⁸ $K^* K$ mode.

⁹ From $a_0(980)\pi$ final state.

¹⁰ From $K^*(890)K$ final state.



$\Gamma(\gamma\eta(1405/1475) \rightarrow \gamma\gamma\rho^0) / \Gamma_{\text{total}}$ Γ_{144} / Γ

<u>VALUE (units 10^{-4})</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.78 ± 0.20 OUR AVERAGE	Error includes scale factor of 1.8.		
$1.07 \pm 0.17 \pm 0.11$	¹ BAI	04J BES2	$J/\psi \rightarrow \gamma\gamma\pi^+\pi^-$
$0.64 \pm 0.12 \pm 0.07$	¹ COFFMAN	90 MRK3	$J/\psi \rightarrow \gamma\gamma\pi^+\pi^-$

¹ Includes unknown branching fraction $\eta(1405) \rightarrow \gamma\rho^0$.

$\Gamma(\gamma\eta(1405/1475) \rightarrow \gamma\eta\pi^+\pi^-) / \Gamma_{\text{total}}$ Γ_{145} / Γ

<u>VALUE (units 10^{-4})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
3.0 ± 0.5 OUR AVERAGE				
$2.6 \pm 0.7 \pm 0.4$		BAI	99 BES	$J/\psi \rightarrow \gamma\eta\pi^+\pi^-$
$3.38 \pm 0.33 \pm 0.64$		¹ BOLTON	92B MRK3	$J/\psi \rightarrow \gamma\eta\pi^+\pi^-$

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

$7.0 \pm 0.6 \pm 1.1$	261	² AUGUSTIN	90 DM2	$J/\psi \rightarrow \gamma\eta\pi^+\pi^-$
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¹ Via $a_0(980)\pi$.

² Includes unknown branching fraction to $\eta\pi^+\pi^-$.

$\Gamma(\gamma\eta(1405/1475) \rightarrow \gamma\gamma\phi) / \Gamma_{\text{total}}$ Γ_{146} / Γ

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

$\Gamma(\gamma\rho\rho)/\Gamma_{\text{total}}$ Γ_{147}/Γ

<u>VALUE (units 10^{-3})</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
4.5 ± 0.8 OUR AVERAGE				
4.7 ± 0.3 ± 0.9		¹ BALTRUSAIT..86B	MRK3	$J/\psi \rightarrow 4\pi\gamma$
3.75 ± 1.05 ± 1.20		² BURKE 82	MRK2	$J/\psi \rightarrow 4\pi\gamma$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
<0.09	90	³ BISELLO 89B		$J/\psi \rightarrow 4\pi\gamma$
¹ 4π mass less than 2.0 GeV.				
² 4π mass less than 2.0 GeV. We have multiplied $2\rho^0$ measurement by 3 to obtain 2ρ .				
³ 4π mass in the range 2.0–25 GeV.				

$\Gamma(\gamma\rho\omega)/\Gamma_{\text{total}}$ Γ_{148}/Γ

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

$\Gamma(\gamma\rho\phi)/\Gamma_{\text{total}}$ Γ_{149}/Γ

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

$\Gamma(\gamma\eta'(958))/\Gamma_{\text{total}}$ Γ_{150}/Γ

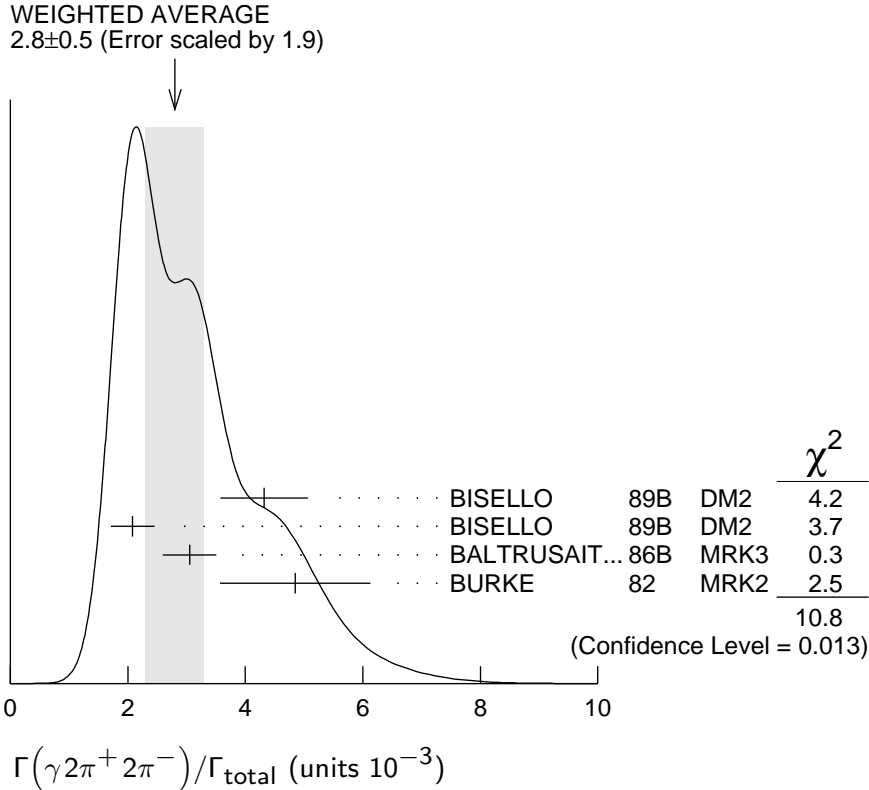
<u>VALUE (units 10^{-3})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
5.15 ± 0.16 OUR AVERAGE		Error includes scale factor of 1.2.		
4.82 ± 0.23 ± 0.08		¹ ABLIKIM 11	BES3	$J/\psi \rightarrow \eta'\gamma$
5.24 ± 0.12 ± 0.11		PEDLAR 09	CLE3	$J/\psi \rightarrow \eta'\gamma$
5.55 ± 0.44	35k	ABLIKIM 06E	BES2	$J/\psi \rightarrow \eta'\gamma$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
4.50 ± 0.14 ± 0.53		BOLTON 92B	MRK3	$J/\psi \rightarrow \gamma\pi^+\pi^-\eta, \eta \rightarrow \gamma\gamma$
4.30 ± 0.31 ± 0.71		BOLTON 92B	MRK3	$J/\psi \rightarrow \gamma\pi^+\pi^-\eta, \eta \rightarrow \pi^+\pi^-\pi^0$
4.04 ± 0.16 ± 0.85	622	AUGUSTIN 90	DM2	$J/\psi \rightarrow \gamma\eta\pi^+\pi^-$
4.39 ± 0.09 ± 0.66	2420	AUGUSTIN 90	DM2	$J/\psi \rightarrow \gamma\gamma\pi^+\pi^-$
4.1 ± 0.3 ± 0.6		BLOOM 83	CBAL	$e^+e^- \rightarrow 3\gamma + \text{hadrons}$
2.9 ± 1.1	6	BRANDELIK 79C	DASP	$e^+e^- \rightarrow 3\gamma$
2.4 ± 0.7	57	BARTEL 76	CNTR	$e^+e^- \rightarrow 2\gamma\rho$

¹ ABLIKIM 11 reports $(4.84 \pm 0.03 \pm 0.24) \times 10^{-3}$ from a measurement of $[\Gamma(J/\psi(1S) \rightarrow \gamma\eta'(958))/\Gamma_{\text{total}}] / [B(\eta'(958) \rightarrow \pi^+\pi^-\eta)] / [B(\eta \rightarrow 2\gamma)]$ assuming $B(\eta'(958) \rightarrow \pi^+\pi^-\eta) = (43.2 \pm 0.7) \times 10^{-2}$, $B(\eta \rightarrow 2\gamma) = (39.31 \pm 0.20) \times 10^{-2}$, which we rescale to our best values $B(\eta'(958) \rightarrow \pi^+\pi^-\eta) = (42.9 \pm 0.7) \times 10^{-2}$, $B(\eta \rightarrow 2\gamma) = (39.41 \pm 0.20) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best values.

$\Gamma(\gamma 2\pi^+ 2\pi^-)/\Gamma_{\text{total}}$ Γ_{151}/Γ

<u>VALUE (units 10^{-3})</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
2.8 ± 0.5 OUR AVERAGE	Error includes scale factor of 1.9. See the ideogram below.		
4.32 ± 0.14 ± 0.73	¹ BISELLO 89B	DM2	$J/\psi \rightarrow 4\pi\gamma$
2.08 ± 0.13 ± 0.35	² BISELLO 89B	DM2	$J/\psi \rightarrow 4\pi\gamma$
3.05 ± 0.08 ± 0.45	² BALTRUSAIT..86B	MRK3	$J/\psi \rightarrow 4\pi\gamma$
4.85 ± 0.45 ± 1.20	³ BURKE 82	MRK2	e^+e^-

- ¹ 4π mass less than 3.0 GeV.
- ² 4π mass less than 2.0 GeV.
- ³ 4π mass less than 2.5 GeV.



$\Gamma(\gamma f_2(1270) f_2(1270)) / \Gamma_{\text{total}}$ Γ_{152} / Γ

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

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

VALUE (units 10^{-4})	DOCUMENT ID	TECN	COMMENT
8.2±0.8±1.7	¹ ABLIKIM	04M BES	$J/\psi \rightarrow \gamma 2\pi^+ 2\pi^-$

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

$\Gamma(\gamma K^+ K^- \pi^+ \pi^-) / \Gamma_{\text{total}}$ Γ_{154} / Γ

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

$\Gamma(\gamma f_4(2050)) / \Gamma_{\text{total}}$ Γ_{155} / Γ

VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
2.7±0.5±0.5	¹ BALTRUSAIT..87	MRK3	$J/\psi \rightarrow \gamma \pi^+ \pi^-$

¹ Assuming branching fraction $f_4(2050) \rightarrow \pi\pi / \text{total} = 0.167$.

$\Gamma(\gamma\omega\omega)/\Gamma_{\text{total}}$ Γ_{156}/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	$J/\psi \rightarrow \gamma\omega\pi^+\pi^-$
1.41±0.2 ±0.42	120 ± 17	BISELLO	87 SPEC	e^+e^- , hadrons γ
1.76±0.09±0.45		BALTRUSAIT..85C	MRK3	$e^+e^- \rightarrow$ hadrons γ

$\Gamma(\gamma\eta(1405/1475) \rightarrow \gamma\rho^0\rho^0)/\Gamma_{\text{total}}$ Γ_{157}/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	$J/\psi \rightarrow \gamma\pi^+\pi^-\pi^+\pi^-$
1.36±0.38	^{1,2} BISELLO	89B DM2	$J/\psi \rightarrow 4\pi\gamma$

¹ Estimated by us from various fits.
² Includes unknown branching fraction to $\rho^0\rho^0$.

$\Gamma(\gamma f_2(1270))/\Gamma_{\text{total}}$ Γ_{158}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
1.43±0.11 OUR AVERAGE				
1.63±0.26 ^{+0.02} _{-0.06}		¹ ABLIKIM	06V BES2	$e^+e^- \rightarrow J/\psi \rightarrow \gamma\pi^+\pi^-$
1.42±0.21 ^{+0.01} _{-0.05}		² ABLIKIM	06V BES2	$e^+e^- \rightarrow J/\psi \rightarrow \gamma\pi^0\pi^0$
1.33±0.05±0.20		³ AUGUSTIN	87 DM2	$J/\psi \rightarrow \gamma\pi^+\pi^-$
1.36±0.09±0.23		³ BALTRUSAIT..87	MRK3	$J/\psi \rightarrow \gamma\pi^+\pi^-$
1.48±0.25±0.30	178	EDWARDS	82B CBAL	$e^+e^- \rightarrow 2\pi^0\gamma$
2.0 ±0.7	35	ALEXANDER	78 PLUT	e^+e^-
1.2 ±0.6	30	⁴ BRANDELIK	78B DASP	$e^+e^- \rightarrow \pi^+\pi^-\gamma$

¹ ABLIKIM 06V reports $[\Gamma(J/\psi(1S) \rightarrow \gamma f_2(1270))/\Gamma_{\text{total}}] \times [B(f_2(1270) \rightarrow \pi\pi)] = (1.371 \pm 0.010 \pm 0.222) \times 10^{-3}$ which we divide by our best value $B(f_2(1270) \rightarrow \pi\pi) = (84.2^{+2.9}_{-0.9}) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.
² ABLIKIM 06V reports $[\Gamma(J/\psi(1S) \rightarrow \gamma f_2(1270))/\Gamma_{\text{total}}] \times [B(f_2(1270) \rightarrow \pi\pi)] = (1.200 \pm 0.027 \pm 0.174) \times 10^{-3}$ which we divide by our best value $B(f_2(1270) \rightarrow \pi\pi) = (84.2^{+2.9}_{-0.9}) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.
³ Estimated using $B(f_2(1270) \rightarrow \pi\pi)=0.843 \pm 0.012$. The errors do not contain the uncertainty in the $f_2(1270)$ decay.
⁴ Restated by us to take account of spread of E1, M2, E3 transitions.

$\Gamma(\gamma f_0(1710) \rightarrow \gamma K\bar{K})/\Gamma_{\text{total}}$ Γ_{159}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID	TECN	COMMENT
8.5 ± 1.2 OUR AVERAGE Error includes scale factor of 1.2.				
9.62±0.29 ^{+3.51} _{-1.86}		¹ BAI	03G BES	$J/\psi \rightarrow \gamma K\bar{K}$
5.0 ± 0.8 ^{+1.8} _{-0.4}		^{2,3} BAI	96C BES	$J/\psi \rightarrow \gamma K^+ K^-$
9.2 ± 1.4±1.4		³ AUGUSTIN	88 DM2	$J/\psi \rightarrow \gamma K^+ K^-$
10.4 ± 1.2±1.6		³ AUGUSTIN	88 DM2	$J/\psi \rightarrow \gamma K_S^0 K_S^0$
9.6 ± 1.2±1.8		³ BALTRUSAIT..87	MRK3	$J/\psi \rightarrow \gamma K^+ K^-$

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

$1.6 \pm 0.2^{+0.6}_{-0.2}$		3,4 BAI	96C	BES	$J/\psi \rightarrow \gamma K^+ K^-$
< 0.8	90	5 BISELLO	89B		$J/\psi \rightarrow 4\pi\gamma$
$1.6 \pm 0.4 \pm 0.3$		6 BALTRUSAIT..87	MRK3		$J/\psi \rightarrow \gamma\pi^+\pi^-$
3.8 ± 1.6		7 EDWARDS	82D	CBAL	$e^+e^- \rightarrow \eta\eta\gamma$

¹ Includes unknown branching ratio to K^+K^- or $K_S^0 K_S^0$.

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

³ Includes unknown branching fraction to K^+K^- or $K_S^0 K_S^0$. We have multiplied K^+K^- measurement by 2, and $K_S^0 K_S^0$ by 4 to obtain $K\bar{K}$ result.

⁴ Assuming $J^P = 0^+$ for $f_0(1710)$.

⁵ Includes unknown branching fraction to $\rho^0\rho^0$.

⁶ Includes unknown branching fraction to $\pi^+\pi^-$.

⁷ Includes unknown branching fraction to $\eta\eta$.

$\Gamma(\gamma f_0(1710) \rightarrow \gamma\pi\pi)/\Gamma_{\text{total}}$ Γ_{160}/Γ

VALUE (units 10^{-4})	DOCUMENT ID	TECN	COMMENT
4.0 ± 1.0 OUR AVERAGE			
$3.96 \pm 0.06 \pm 1.12$	¹ ABLIKIM	06V BES2	$e^+e^- \rightarrow J/\psi \rightarrow \gamma\pi^+\pi^-$
$3.99 \pm 0.15 \pm 2.64$	¹ ABLIKIM	06V BES2	$e^+e^- \rightarrow J/\psi \rightarrow \gamma\pi^0\pi^0$

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

$2.5 \pm 1.6 \pm 0.8$	BAI	98H	BES	$J/\psi \rightarrow \gamma\pi^0\pi^0$
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¹ Including unknown branching fraction to $\pi\pi$.

$\Gamma(\gamma f_0(1710) \rightarrow \gamma\omega\omega)/\Gamma_{\text{total}}$ Γ_{161}/Γ

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

$\Gamma(\gamma f_0(1710) \rightarrow \gamma\eta\eta)/\Gamma_{\text{total}}$ Γ_{162}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
$2.35^{+0.13+1.24}_{-0.11-0.74}$	5.5k	¹ ABLIKIM	13N BES3	$J/\psi \rightarrow \gamma\eta\eta$

¹ From partial wave analysis including all possible combinations of 0^{++} , 2^{++} , and 4^{++} resonances.

$\Gamma(\gamma\eta)/\Gamma_{\text{total}}$ Γ_{163}/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	$J/\psi \rightarrow \eta\gamma$
1.123 ± 0.089	11k	ABLIKIM	06E BES2	$J/\psi \rightarrow \eta\gamma$

• • • 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^-

$\Gamma(\gamma f_1(1420) \rightarrow \gamma K \bar{K} \pi) / \Gamma_{\text{total}}$ Γ_{164} / Γ

<u>VALUE (units 10^{-3})</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.79 ± 0.13 OUR AVERAGE			
0.68 ± 0.04 ± 0.24	BAI	00D BES	$J/\psi \rightarrow \gamma K^\pm K_S^0 \pi^\mp$
0.76 ± 0.15 ± 0.21	^{1,2} AUGUSTIN	92 DM2	$J/\psi \rightarrow \gamma K \bar{K} \pi$
0.87 ± 0.14 ^{+0.14} _{-0.11}	¹ BAI	90C MRK3	$J/\psi \rightarrow \gamma K_S^0 K^\pm \pi^\mp$

¹ Included unknown branching fraction $f_1(1420) \rightarrow K \bar{K} \pi$.

² From fit to the $K^*(892) K 1^{++}$ partial wave.

$\Gamma(\gamma f_1(1285)) / \Gamma_{\text{total}}$ Γ_{165} / Γ

<u>VALUE (units 10^{-3})</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.61 ± 0.08 OUR AVERAGE			
0.69 ± 0.16 ± 0.20	¹ BAI	04J BES2	$J/\psi \rightarrow \gamma \gamma \rho^0$
0.61 ± 0.04 ± 0.21	² BAI	00D BES	$J/\psi \rightarrow \gamma K^\pm K_S^0 \pi^\mp$
0.45 ± 0.09 ± 0.17	³ BAI	99 BES	$J/\psi \rightarrow \gamma \eta \pi^+ \pi^-$
0.625 ± 0.063 ± 0.103	⁴ BOLTON	92 MRK3	$J/\psi \rightarrow \gamma f_1(1285)$
0.70 ± 0.08 ± 0.16	⁵ BOLTON	92B MRK3	$J/\psi \rightarrow \gamma \eta \pi^+ \pi^-$

¹ Assuming $B(f_1(1285) \rightarrow \rho^0 \gamma) = 0.055 \pm 0.013$.

² Assuming $\Gamma(f_1(1285) \rightarrow K \bar{K} \pi) / \Gamma_{\text{total}} = 0.090 \pm 0.004$.

³ Assuming $\Gamma(f_1(1285) \rightarrow \eta \pi \pi) / \Gamma_{\text{total}} = 0.5 \pm 0.18$.

⁴ Obtained summing the sequential decay channels

$$B(J/\psi \rightarrow \gamma f_1(1285), f_1(1285) \rightarrow \pi \pi \pi \pi) = (1.44 \pm 0.39 \pm 0.27) \times 10^{-4};$$

$$B(J/\psi \rightarrow \gamma f_1(1285), f_1(1285) \rightarrow a_0(980) \pi, a_0(980) \rightarrow \eta \pi) = (3.90 \pm 0.42 \pm 0.87) \times 10^{-4};$$

$$B(J/\psi \rightarrow \gamma f_1(1285), f_1(1285) \rightarrow a_0(980) \pi, a_0(980) \rightarrow K \bar{K}) = (0.66 \pm 0.26 \pm 0.29) \times 10^{-4};$$

$$B(J/\psi \rightarrow \gamma f_1(1285), f_1(1285) \rightarrow \gamma \rho^0) = (0.25 \pm 0.07 \pm 0.03) \times 10^{-4}.$$

⁵ Using $B(f_1(1285) \rightarrow a_0(980) \pi) = 0.37$, and including unknown branching ratio for $a_0(980) \rightarrow \eta \pi$.

$\Gamma(\gamma f_1(1510) \rightarrow \gamma \eta \pi^+ \pi^-) / \Gamma_{\text{total}}$ Γ_{166} / Γ

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

$\Gamma(\gamma f_2'(1525)) / \Gamma_{\text{total}}$ Γ_{167} / Γ

<u>VALUE (units 10^{-4})</u>	<u>CL%</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
4.5 ^{+0.7} _{-0.4} OUR AVERAGE					
3.85 ± 0.17 ^{+1.91} _{-0.73}			¹ BAI	03G BES	$J/\psi \rightarrow \gamma K \bar{K}$
3.6 ± 0.4 ^{+1.4} _{-0.4}			¹ BAI	96C BES	$J/\psi \rightarrow \gamma K^+ K^-$
5.6 ± 1.4 ± 0.9			¹ AUGUSTIN	88 DM2	$J/\psi \rightarrow \gamma K^+ K^-$
4.5 ± 0.4 ± 0.9			¹ AUGUSTIN	88 DM2	$J/\psi \rightarrow \gamma K_S^0 K_S^0$
6.8 ± 1.6 ± 1.4			¹ BALTRUSAIT..87	MRK3	$J/\psi \rightarrow \gamma K^+ K^-$

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

<3.4	90	4	² BRANDELIK	79C DASP	$e^+ e^- \rightarrow \pi^+ \pi^- \gamma$
<2.3	90	3	ALEXANDER	78 PLUT	$e^+ e^- \rightarrow K^+ K^- \gamma$

¹ Using $B(f'_2(1525) \rightarrow K\bar{K}) = 0.888$.

² Assuming isotropic production and decay of the $f'_2(1525)$ and isospin.

$\Gamma(\gamma f'_2(1525) \rightarrow \gamma\eta\eta)/\Gamma_{\text{total}}$					Γ_{168}/Γ
VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT	
$3.42^{+0.43+1.37}_{-0.51-1.30}$	5.5k	¹ ABLIKIM	13N BES3	$J/\psi \rightarrow \gamma\eta\eta$	

¹ From partial wave analysis including all possible combinations of 0^{++} , 2^{++} , and 4^{++} resonances.

$\Gamma(\gamma f_2(1640) \rightarrow \gamma\omega\omega)/\Gamma_{\text{total}}$					Γ_{169}/Γ
VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT	
$0.28 \pm 0.05 \pm 0.17$	141	ABLIKIM	06H BES	$J/\psi \rightarrow \gamma\omega\omega$	

$\Gamma(\gamma f_2(1910) \rightarrow \gamma\omega\omega)/\Gamma_{\text{total}}$					Γ_{170}/Γ
VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT	
$0.20 \pm 0.04 \pm 0.13$	151	ABLIKIM	06H BES	$J/\psi \rightarrow \gamma\omega\omega$	

$\Gamma(\gamma f_0(1800) \rightarrow \gamma\omega\phi)/\Gamma_{\text{total}}$					Γ_{171}/Γ
VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT	
2.5 \pm 0.6 OUR AVERAGE					
$2.00 \pm 0.08^{+1.38}_{-1.64}$	1.3k	ABLIKIM	13J BES3	$J/\psi \rightarrow \gamma\omega\phi$	
$2.61 \pm 0.27 \pm 0.65$	95	ABLIKIM	06J BES2	$J/\psi \rightarrow \gamma\omega\phi$	

$\Gamma(\gamma f_2(1810) \rightarrow \gamma\eta\eta)/\Gamma_{\text{total}}$					Γ_{172}/Γ
VALUE (units 10^{-5})	EVTS	DOCUMENT ID	COMMENT		
$5.40^{+0.60+3.42}_{-0.67-2.35}$	5.5k	¹ ABLIKIM	13N	$J/\psi \rightarrow \gamma\eta\eta$	

¹ From partial wave analysis including all possible combinations of 0^{++} , 2^{++} , and 4^{++} resonances.

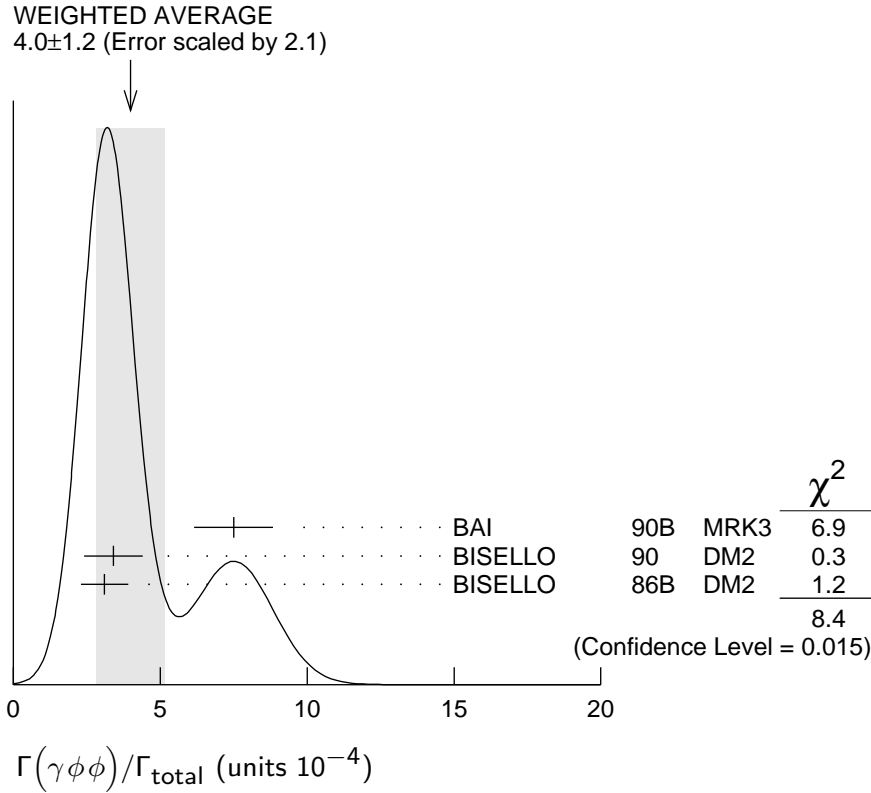
$\Gamma(\gamma f_2(1950) \rightarrow \gamma K^*(892)\bar{K}^*(892))/\Gamma_{\text{total}}$					Γ_{173}/Γ
VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT		
$0.7 \pm 0.1 \pm 0.2$	BAI	00B BES	$J/\psi \rightarrow \gamma K^+ K^0 \pi^+ \pi^-$		

$\Gamma(\gamma K^*(892)\bar{K}^*(892))/\Gamma_{\text{total}}$					Γ_{174}/Γ
VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT	
$4.0 \pm 0.3 \pm 1.3$	320	¹ BAI	00B BES	$J/\psi \rightarrow \gamma K^+ K^0 \pi^+ \pi^-$	

¹ Summed over all charges.

$\Gamma(\gamma\phi\phi)/\Gamma_{\text{total}}$					Γ_{175}/Γ
VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT	
4.0 \pm 1.2 OUR AVERAGE				Error includes scale factor of 2.1. See the ideogram below.	
$7.5 \pm 0.6 \pm 1.2$	168	BAI	90B MRK3	$J/\psi \rightarrow \gamma 4K$	
$3.4 \pm 0.8 \pm 0.6$	33 ± 7	¹ BISELLO	90 DM2	$J/\psi \rightarrow \gamma K^+ K^- K_S^0 K_L^0$	
$3.1 \pm 0.7 \pm 0.4$		¹ BISELLO	86B DM2	$J/\psi \rightarrow \gamma K^+ K^- K^+ K^-$	

¹ $\phi\phi$ mass less than 2.9 GeV, η_c excluded.



$\Gamma(\gamma\rho\bar{\rho})/\Gamma_{\text{total}}$ **Γ_{176}/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^-

$\Gamma(\gamma\eta(2225))/\Gamma_{\text{total}}$ **Γ_{177}/Γ**

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
0.33±0.05 OUR AVERAGE				
0.44±0.04±0.08	196 ± 19	¹ ABLIKIM	08I BES	$J/\psi \rightarrow \gamma K^+ K^- K_S^0 K_L^0$
0.33±0.08±0.05		¹ BAI	90B MRK3	$J/\psi \rightarrow \gamma K^+ K^- K^+ K^-$
0.27±0.06±0.06		¹ BAI	90B MRK3	$J/\psi \rightarrow \gamma K^+ K^- K_S^0 K_L^0$
0.24 ^{+0.15} _{-0.10}		^{2,3} BISELLO	89B DM2	$J/\psi \rightarrow 4\pi\gamma$

¹ Includes unknown branching fraction to $\phi\phi$.
² Estimated by us from various fits.
³ Includes unknown branching fraction to $\rho^0\rho^0$.

$\Gamma(\gamma\eta(1760) \rightarrow \gamma\rho^0\rho^0)/\Gamma_{\text{total}}$ **Γ_{178}/Γ**

VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
0.13±0.09	^{1,2} BISELLO	89B DM2	$J/\psi \rightarrow 4\pi\gamma$

¹ Estimated by us from various fits.
² Includes unknown branching fraction to $\rho^0\rho^0$.

$\Gamma(\gamma\eta(1760) \rightarrow \gamma\omega\omega)/\Gamma_{\text{total}}$ Γ_{179}/Γ

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

$\Gamma(\gamma X(1835) \rightarrow \gamma\pi^+\pi^-\eta')/\Gamma_{\text{total}}$ Γ_{180}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
2.6 ± 0.4 OUR AVERAGE				
2.87 ± 0.09 ^{+0.49} _{-0.52}	4265	¹ ABLIKIM	11C	BES3 $J/\psi \rightarrow \gamma\pi^+\pi^-\eta'$
2.2 ± 0.4 ± 0.4	264	ABLIKIM	05R	BES2 $J/\psi \rightarrow \gamma\pi^+\pi^-\eta'$

¹ 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 $M(p\bar{p}) < 2.8$ GeV, and accounting for backgrounds from non- η' events and $J/\psi \rightarrow \pi^0\pi^+\pi^-\eta'$.

$\Gamma(\gamma X(1835) \rightarrow \gamma p\bar{p})/\Gamma_{\text{total}}$ Γ_{181}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
0.77^{+0.15}_{-0.09} OUR AVERAGE				
0.90 ^{+0.04+0.27} _{-0.11-0.55}		¹ ABLIKIM	12D	BES3 $J/\psi \rightarrow \gamma p\bar{p}$
1.14 ^{+0.43+0.42} _{-0.30-0.26}	231	² ALEXANDER	10	CLEO $J/\psi \rightarrow \gamma p\bar{p}$
0.70 ± 0.04 ^{+0.19} _{-0.08}		BAI	03F	BES2 $J/\psi \rightarrow \gamma p\bar{p}$

¹ From the fit including final state interaction effects in isospin 0 S-wave according to SIBIRTSEV 05A.

² From a fit of the $p\bar{p}$ mass distribution to a combination of $\gamma X(1835)$, γR with $M(R) = 2100$ MeV and $\Gamma(R) = 160$ MeV, and $\gamma p\bar{p}$ phase space, for $M(p\bar{p}) < 2.85$ GeV.

$\Gamma(\gamma X(1840) \rightarrow \gamma 3(\pi^+\pi^-))/\Gamma_{\text{total}}$ Γ_{182}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT
2.44 ± 0.36^{+0.60}_{-0.74}	0.6k	ABLIKIM	13U	BES3 $J/\psi \rightarrow \gamma 3(\pi^+\pi^-)$

$\Gamma(\gamma(K\bar{K}\pi)[J^{PC} = 0^{-+}])/ \Gamma_{\text{total}}$ Γ_{183}/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	¹ BAI	00D	BES $J/\psi \rightarrow \gamma K^\pm K_S^0 \pi^\mp$
2.1 ± 0.1 ± 0.7	² BAI	00D	BES $J/\psi \rightarrow \gamma K^\pm K_S^0 \pi^\mp$

¹ For a broad structure around 1800 MeV.

² For a broad structure around 2040 MeV.

$\Gamma(\gamma\pi^0)/\Gamma_{\text{total}}$ Γ_{184}/Γ

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

$\Gamma(\gamma\rho\bar{p}\pi^+\pi^-)/\Gamma_{\text{total}}$ Γ_{185}/Γ

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

$\Gamma(\gamma\Lambda\bar{\Lambda})/\Gamma_{\text{total}}$ Γ_{186}/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^-
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$\Gamma(\gamma f_0(2100) \rightarrow \gamma\eta\eta)/\Gamma_{\text{total}}$ Γ_{187}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
$1.13^{+0.09+0.64}_{-0.10-0.28}$	5.5k	¹ ABLIKIM	13N	BES3 $J/\psi \rightarrow \gamma\eta\eta$

¹ From partial wave analysis including all possible combinations of 0^{++} , 2^{++} , and 4^{++} resonances.

$\Gamma(\gamma f_0(2200))/\Gamma_{\text{total}}$ Γ_{188}/Γ

VALUE (units 10^{-4})	DOCUMENT ID	TECN	COMMENT
1.5	¹ AUGUSTIN	88	DM2 $J/\psi \rightarrow \gamma K_S^0 K_S^0$

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

¹ Includes unknown branching fraction to $K_S^0 K_S^0$.

$\Gamma(\gamma f_J(2220))/\Gamma_{\text{total}}$ Γ_{189}/Γ

VALUE (units 10^{-5})	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
>250	99.9		¹ HASAN	96	SPEC $\bar{p}p \rightarrow \pi^+\pi^-$

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

>300			² BAI	96B	BES $e^+e^- \rightarrow \gamma\bar{p}p, K\bar{K}$
< 2.3	95		³ AUGUSTIN	88	DM2 $J/\psi \rightarrow \gamma K^+ K^-$
< 1.6	95		³ AUGUSTIN	88	DM2 $J/\psi \rightarrow \gamma K_S^0 K_S^0$
$12.4^{+6.4}_{-5.2} \pm 2.8$		23	³ BALTRUSAIT..86D	MRK3	$J/\psi \rightarrow \gamma K_S^0 K_S^0$
$8.4^{+3.4}_{-2.8} \pm 1.6$		93	³ BALTRUSAIT..86D	MRK3	$J/\psi \rightarrow \gamma K^+ K^-$

¹ Using BAI 96B.

² Using BARNES 93.

³ Includes unknown branching fraction to $K^+ K^-$ or $K_S^0 K_S^0$.

$\Gamma(\gamma f_J(2220) \rightarrow \gamma\pi\pi)/\Gamma_{\text{total}}$ Γ_{190}/Γ

VALUE (units 10^{-4})	DOCUMENT ID	TECN	COMMENT
$0.84 \pm 0.26 \pm 0.30$	BAI	96B	BES $e^+e^- \rightarrow J/\psi \rightarrow \gamma\pi^+\pi^-$

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

$1.4 \pm 0.8 \pm 0.4$	BAI	98H	BES $J/\psi \rightarrow \gamma\pi^0\pi^0$
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$\Gamma(\gamma f_J(2220) \rightarrow \gamma K \bar{K})/\Gamma_{\text{total}}$ Γ_{191}/Γ

VALUE (units 10^{-5})	DOCUMENT ID	TECN	COMMENT
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< 3.6 ¹ DEL-AMO-SA...100 BABR $e^+e^- \rightarrow J/\psi \rightarrow \gamma K^+ K^-$

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

< 2.9 ¹ DEL-AMO-SA...100 BABR $e^+e^- \rightarrow J/\psi \rightarrow \gamma K_S^0 K_S^0$

6.6 ± 2.9 ± 2.4 BAI 96B BES $e^+e^- \rightarrow J/\psi \rightarrow \gamma K^+ K^-$

10.8 ± 4.0 ± 3.2 BAI 96B BES $e^+e^- \rightarrow J/\psi \rightarrow \gamma K_S^0 K_S^0$

¹ For spin 2 and helicity 0; other combinations lead to more stringent upper limits.

$\Gamma(\gamma f_J(2220) \rightarrow \gamma \rho \bar{\rho})/\Gamma_{\text{total}}$ Γ_{192}/Γ

VALUE (units 10^{-5})	DOCUMENT ID	TECN	COMMENT
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1.5 ± 0.6 ± 0.5 BAI 96B BES $e^+e^- \rightarrow J/\psi \rightarrow \gamma \rho \bar{\rho}$

$\Gamma(\gamma f_2(2340) \rightarrow \gamma \eta \eta)/\Gamma_{\text{total}}$ Γ_{193}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT
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5.60^{+0.62+2.37}_{-0.65-2.07} 5.5k ¹ ABLIKIM 13N BES3 $J/\psi \rightarrow \gamma \eta \eta$

¹ From partial wave analysis including all possible combinations of 0^{++} , 2^{++} , and 4^{++} resonances.

$\Gamma(\gamma f_0(1500) \rightarrow \gamma \pi \pi)/\Gamma_{\text{total}}$ Γ_{194}/Γ

VALUE (units 10^{-4})	DOCUMENT ID	TECN	COMMENT
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1.01 ± 0.32 OUR AVERAGE

1.00 ± 0.03 ± 0.45 ¹ ABLIKIM 06V BES2 $e^+e^- \rightarrow J/\psi \rightarrow \gamma \pi^+ \pi^-$

1.02 ± 0.09 ± 0.45 ¹ ABLIKIM 06V BES2 $e^+e^- \rightarrow J/\psi \rightarrow \gamma \pi^0 \pi^0$

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

>5.7 ± 0.8 ^{2,3} BUGG 95 MRK3 $J/\psi \rightarrow \gamma \pi^+ \pi^- \pi^+ \pi^-$

¹ Including unknown branching fraction to $\pi \pi$.

² Including unknown branching ratio for $f_0(1500) \rightarrow \pi^+ \pi^- \pi^+ \pi^-$.

³ Assuming that $f_0(1500)$ decays only to two S -wave dipions.

$\Gamma(\gamma f_0(1500) \rightarrow \gamma \eta \eta)/\Gamma_{\text{total}}$ Γ_{195}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT
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1.65^{+0.26+0.51}_{-0.31-1.40} 5.5k ¹ ABLIKIM 13N BES3 $J/\psi \rightarrow \gamma \eta \eta$

¹ From partial wave analysis including all possible combinations of 0^{++} , 2^{++} , and 4^{++} resonances.

$\Gamma(\gamma A \rightarrow \gamma \text{invisible})/\Gamma_{\text{total}}$ Γ_{196}/Γ
(narrow state A with $m_A < 960$ MeV)

VALUE (units 10^{-6})	CL%	DOCUMENT ID	TECN	COMMENT
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<6.3 90 ¹ INSLER 10 CLEO $e^+e^- \rightarrow \pi^+ \pi^- J/\psi$

¹ 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.

$\Gamma(\gamma A^0 \rightarrow \gamma \mu^+ \mu^-)/\Gamma_{\text{total}}$ Γ_{197}/Γ
(narrow state A^0 with $0.2 \text{ GeV} < m_{A^0} < 3 \text{ GeV}$)

<u>VALUE (units 10^{-5})</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<2.1	90	¹ ABLIKIM 12	BES3	$J/\psi \rightarrow \gamma \mu^+ \mu^-$

¹ For a narrow scalar or pseudoscalar, A^0 , with a mass in the range 0.21–3.00 GeV. The measured 90% CL limit as a function of m_{A^0} ranges from 4×10^{-7} to 2.1×10^{-5} .

————— **DALITZ DECAYS** —————

$\Gamma(\pi^0 e^+ e^-)/\Gamma_{\text{total}}$ Γ_{198}/Γ

<u>VALUE (units 10^{-7})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$7.56 \pm 1.32 \pm 0.50$	39	ABLIKIM 14i	BES3	$J/\psi \rightarrow \pi^0 e^+ e^-$

$\Gamma(\eta e^+ e^-)/\Gamma_{\text{total}}$ Γ_{199}/Γ

<u>VALUE (units 10^{-5})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$1.16 \pm 0.07 \pm 0.06$	320	¹ ABLIKIM 14i	BES3	$J/\psi \rightarrow \eta e^+ e^-$

¹ Using both $\eta \rightarrow \gamma \gamma$ and $\eta \rightarrow \pi^+ \pi^- \pi^0$ decays.

$\Gamma(\eta'(958) e^+ e^-)/\Gamma_{\text{total}}$ Γ_{200}/Γ

<u>VALUE (units 10^{-5})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$5.81 \pm 0.16 \pm 0.31$	1.4k	¹ ABLIKIM 14i	BES3	$J/\psi \rightarrow \eta' e^+ e^-$

¹ Using both $\eta' \rightarrow \gamma \pi^+ \pi^-$ and $\eta' \rightarrow \pi^+ \pi^- \eta$ decays.

————— **WEAK DECAYS** —————

$\Gamma(D^- e^+ \nu_e + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{201}/Γ

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

$\Gamma(\bar{D}^0 e^+ e^- + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{202}/Γ

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

$\Gamma(D_s^- e^+ \nu_e + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{203}/Γ

<u>VALUE (units 10^{-5})</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<3.6	90	¹ ABLIKIM 06M	BES2	$e^+ e^- \rightarrow J/\psi$

¹ Using $B(D_s^- \rightarrow \phi \pi^-) = 4.4 \pm 0.5 \%$.

$\Gamma(D^- \pi^+ + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{204}/Γ

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

$\Gamma(\bar{D}^0 \bar{K}^0 + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{205}/Γ

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

$\Gamma(\bar{D}^0 \bar{K}^{*0} + \text{c.c.})/\Gamma_{\text{total}}$					Γ_{206}/Γ
VALUE	CL%	DOCUMENT ID	TECN	COMMENT	
$< 2.5 \times 10^{-6}$	90	ABLIKIM	14K	BES3	$e^+ e^- \rightarrow J/\psi$

$\Gamma(D_s^- \pi^+ + \text{c.c.})/\Gamma_{\text{total}}$					Γ_{207}/Γ
VALUE	CL%	DOCUMENT ID	TECN	COMMENT	
$< 1.3 \times 10^{-4}$	90	ABLIKIM	08J	BES2	$e^+ e^- \rightarrow J/\psi$

$\Gamma(D_s^- \rho^+ + \text{c.c.})/\Gamma_{\text{total}}$					Γ_{208}/Γ
VALUE	CL%	DOCUMENT ID	TECN	COMMENT	
$< 1.3 \times 10^{-5}$	90	ABLIKIM	14K	BES3	$e^+ e^- \rightarrow J/\psi$

———— CHARGE CONJUGATION (C), PARITY (P), ————

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

$\Gamma(\gamma\gamma)/\Gamma_{\text{total}}$					Γ_{209}/Γ
VALUE (units 10^{-7})	CL%	DOCUMENT ID	TECN	COMMENT	
< 2.7	90	ABLIKIM	14Q	BES3	$\psi(2S) \rightarrow \pi^+ \pi^- J/\psi$

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

< 50	90	ADAMS	08	CLEO	$\psi(2S) \rightarrow \pi^+ \pi^- J/\psi$
< 1600	90	¹ WICHT	08	BELL	$B^\pm \rightarrow K^\pm \gamma\gamma$
< 220	90	ABLIKIM	07J	BES2	$\psi(2S) \rightarrow J/\psi \pi^+ \pi^-$
< 5000	90	BARTEL	77	CNTR	$e^+ e^-$

¹WICHT 08 reports $[\Gamma(J/\psi(1S) \rightarrow \gamma\gamma)/\Gamma_{\text{total}}] \times [B(B^+ \rightarrow J/\psi(1S) K^+)] < 0.16 \times 10^{-6}$ which we divide by our best value $B(B^+ \rightarrow J/\psi(1S) K^+) = 1.026 \times 10^{-3}$.

$\Gamma(\gamma\phi)/\Gamma_{\text{total}}$					Γ_{210}/Γ
VALUE	CL%	DOCUMENT ID	TECN	COMMENT	
$< 1.4 \times 10^{-6}$	90	ABLIKIM	14Q	BES3	$\psi(2S) \rightarrow \pi^+ \pi^- J/\psi$

$\Gamma(e^\pm \mu^\mp)/\Gamma_{\text{total}}$					Γ_{211}/Γ
VALUE (units 10^{-7})	CL%	DOCUMENT ID	TECN	COMMENT	
< 1.6	90	ABLIKIM	13L	BES3	$e^+ e^- \rightarrow J/\psi$

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

< 11	90	BAI	03D	BES	$e^+ e^- \rightarrow J/\psi$
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$\Gamma(e^\pm \tau^\mp)/\Gamma_{\text{total}}$					Γ_{212}/Γ
VALUE (units 10^{-6})	CL%	DOCUMENT ID	TECN	COMMENT	
< 8.3	90	ABLIKIM	04	BES	$e^+ e^- \rightarrow J/\psi$

$\Gamma(\mu^\pm \tau^\mp)/\Gamma_{\text{total}}$					Γ_{213}/Γ
VALUE (units 10^{-6})	CL%	DOCUMENT ID	TECN	COMMENT	
< 2.0	90	ABLIKIM	04	BES	$e^+ e^- \rightarrow J/\psi$

OTHER DECAYS

$\Gamma(\text{invisible})/\Gamma(e^+e^-)$					Γ_{214}/Γ_5
<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
$<6.6 \times 10^{-2}$	90	LEES	13I	BABR	$B \rightarrow K^{(*)} J/\psi$

$\Gamma(\text{invisible})/\Gamma(\mu^+\mu^-)$					Γ_{214}/Γ_7
<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
$<1.2 \times 10^{-2}$	90	ABLIKIM	08G	BES2	$\psi(2S) \rightarrow \pi^+\pi^- J/\psi$

 $J/\psi(1S)$ REFERENCES

ABLIKIM	14I	PR D89 092008	M. Ablikim <i>et al.</i>	(BES III Collab.)
ABLIKIM	14K	PR D89 071101	M. Ablikim <i>et al.</i>	(BES III Collab.)
ABLIKIM	14N	PR D90 052009	M. Ablikim <i>et al.</i>	(BES III Collab.)
ABLIKIM	14Q	PR D90 092002	M. Ablikim <i>et al.</i>	(BES III Collab.)
AULCHENKO	14	PL B731 227	V.M. Aulchenko <i>et al.</i>	(KEDR Collab.)
ABLIKIM	13F	PR D87 052007	M. Ablikim <i>et al.</i>	(BES III Collab.)
ABLIKIM	13I	PR D87 032003	M. Ablikim <i>et al.</i>	(BES III Collab.)
ABLIKIM	13J	PR D87 032008	M. Ablikim <i>et al.</i>	(BES III Collab.)
ABLIKIM	13L	PR D87 112007	Ablikim M. <i>et al.</i>	(BES III Collab.)
ABLIKIM	13N	PR D87 092009	Ablikim M. <i>et al.</i>	(BES III Collab.)
ABLIKIM	13P	PR D87 112004	M. Ablikim <i>et al.</i>	(BES III Collab.)
ABLIKIM	13R	PR D88 032007	M. Ablikim <i>et al.</i>	(BES III Collab.)
ABLIKIM	13U	PR D88 091502	M. Ablikim <i>et al.</i>	(BES III Collab.)
LEES	13I	PR D87 112005	J.P. Lees <i>et al.</i>	(BABAR Collab.)
LEES	13O	PR D87 092005	J.P. Lees <i>et al.</i>	(BABAR Collab.)
LEES	13Q	PR D88 032013	J.P. Lees <i>et al.</i>	(BABAR Collab.)
LEES	13Y	PR D88 072009	J.P. Lees <i>et al.</i>	(BABAR Collab.)
ABLIKIM	12	PR D85 092012	M. Ablikim <i>et al.</i>	(BES III Collab.)
ABLIKIM	12B	PR D86 032008	M. Ablikim <i>et al.</i>	(BES III Collab.)
ABLIKIM	12C	PR D86 032014	M. Ablikim <i>et al.</i>	(BES III Collab.)
ABLIKIM	12D	PRL 108 112003	M. Ablikim <i>et al.</i>	(BES III Collab.)
ABLIKIM	12H	PL B710 594	M. Ablikim <i>et al.</i>	(BES III Collab.)
ABLIKIM	12P	CPC 36 1031	M. Ablikim <i>et al.</i>	(BES II Collab.)
LEES	12E	PR D85 112009	J.P. Lees <i>et al.</i>	(BABAR Collab.)
METREVELI	12	PR D85 092007	Z. Metreveli <i>et al.</i>	(NWES, FLOR, WAYN+)
ABLIKIM	11	PR D83 012003	M. Ablikim <i>et al.</i>	(BES III Collab.)
ABLIKIM	11C	PRL 106 072002	M. Ablikim <i>et al.</i>	(BES III Collab.)
ABLIKIM	11D	PR D83 032003	M. Ablikim <i>et al.</i>	(BES III Collab.)
ABLIKIM	10C	PL B685 27	M. Ablikim <i>et al.</i>	(BES II Collab.)
ABLIKIM	10E	PL B693 88	M. Ablikim <i>et al.</i>	(BES II Collab.)
ALEXANDER	10	PR D82 092002	J.P. Alexander <i>et al.</i>	(CLEO Collab.)
ANASHIN	10	PL B685 134	V.V. Anashin <i>et al.</i>	(KEDR Collab.)
DEL-AMO-SA...	100	PRL 105 172001	P. del Amo Sanchez <i>et al.</i>	(BABAR Collab.)
INSLER	10	PR D81 091101	J. Insler <i>et al.</i>	(CLEO Collab.)
ABLIKIM	09	PL B676 25	M. Ablikim <i>et al.</i>	(BES Collab.)
ABLIKIM	09B	PR D80 052004	M. Ablikim <i>et al.</i>	(BES II Collab.)
MITCHELL	09	PRL 102 011801	R.E. Mitchell <i>et al.</i>	(CLEO Collab.)
PEDLAR	09	PR D79 111101	T.K. Pedlar <i>et al.</i>	(CLEO Collab.)
SHEN	09	PR D80 031101	C.P. Shen <i>et al.</i>	(BELLE Collab.)
ABLIKIM	08	EPJ C53 15	M. Ablikim <i>et al.</i>	(BES Collab.)
ABLIKIM	08A	PR D77 012001	M. Ablikim <i>et al.</i>	(BES Collab.)
ABLIKIM	08C	PL B659 789	M. Ablikim <i>et al.</i>	(BES Collab.)
ABLIKIM	08E	PR D77 032005	M. Ablikim <i>et al.</i>	(BES Collab.)
ABLIKIM	08F	PRL 100 102003	M. Ablikim <i>et al.</i>	(BES Collab.)
ABLIKIM	08G	PRL 100 192001	M. Ablikim <i>et al.</i>	(BES Collab.)
ABLIKIM	08I	PL B662 330	M. Ablikim <i>et al.</i>	(BES Collab.)
ABLIKIM	08J	PL B663 297	M. Ablikim <i>et al.</i>	(BES Collab.)
ABLIKIM	08O	PR D78 092005	M. Ablikim <i>et al.</i>	(BES Collab.)
ADAMS	08	PRL 101 101801	G.S. Adams <i>et al.</i>	(CLEO Collab.)
AUBERT	08S	PR D77 092002	B. Aubert <i>et al.</i>	(BABAR Collab.)
BESSON	08	PR D78 032012	D. Besson <i>et al.</i>	(CLEO Collab.)
PDG	08	PL B667 1	C. Amsler <i>et al.</i>	(PDG Collab.)
WICHT	08	PL B662 323	J. Wicht <i>et al.</i>	(BELLE Collab.)
ABLIKIM	07H	PR D76 092003	M. Ablikim <i>et al.</i>	(BES Collab.)

ABLIKIM	07J	PR D76 117101	M. Ablikim <i>et al.</i>	(BES Collab.)
ANDREOTTI	07	PL B654 74	M. Andreotti <i>et al.</i>	(Femilab E835 Collab.)
AUBERT	07AK	PR D76 012008	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	07AU	PR D76 092005	B. Aubert <i>et al.</i>	(BABAR Collab.)
Also		PR D77 119902E (errat.)	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	07BD	PR D76 092006	B. Aubert <i>et al.</i>	(BABAR Collab.)
ABLIKIM	06	PL B632 181	M. Ablikim <i>et al.</i>	(BES Collab.)
ABLIKIM	06C	PL B633 681	M. Ablikim <i>et al.</i>	(BES Collab.)
ABLIKIM	06E	PR D73 052008	M. Ablikim <i>et al.</i>	(BES Collab.)
ABLIKIM	06F	PR D73 052007	M. Ablikim <i>et al.</i>	(BES Collab.)
ABLIKIM	06H	PR D73 112007	M. Ablikim <i>et al.</i>	(BES Collab.)
ABLIKIM	06J	PRL 96 162002	M. Ablikim <i>et al.</i>	(BES Collab.)
ABLIKIM	06K	PRL 97 062001	M. Ablikim <i>et al.</i>	(BES II Collab.)
ABLIKIM	06M	PL B639 418	M. Ablikim <i>et al.</i>	(BES Collab.)
ABLIKIM	06V	PL B642 441	M. Ablikim <i>et al.</i>	(BES Collab.)
ADAMS	06A	PR D73 051103	G.S. Adams <i>et al.</i>	(CLEO Collab.)
AUBERT	06B	PR D73 012005	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	06D	PR D73 052003	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	06E	PRL 96 052002	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,BE	06D	PR D74 091103	B. Aubert <i>et al.</i>	(BABAR Collab.)
WU	06	PRL 97 162003	C.-H. Wu <i>et al.</i>	(BELLE Collab.)
ABLIKIM	05	PL B607 243	M. Ablikim <i>et al.</i>	(BES Collab.)
ABLIKIM	05B	PR D71 032003	M. Ablikim <i>et al.</i>	(BES Collab.)
ABLIKIM	05C	PL B610 192	M. Ablikim <i>et al.</i>	(BES Collab.)
ABLIKIM	05H	PR D72 012002	M. Ablikim <i>et al.</i>	(BES Collab.)
ABLIKIM	05R	PRL 95 262001	M. Ablikim <i>et al.</i>	(BES Collab.)
AUBERT	05D	PR D71 052001	B. Aubert <i>et al.</i>	(BABAR Collab.)
LI	05C	PR D71 111103	Z. Li <i>et al.</i>	(CLEO Collab.)
SIBIRTSEV	05A	PR D71 054010	A. Sibirtsev, J. Haidenbauer	
ABLIKIM	04	PL B598 172	M. Ablikim <i>et al.</i>	(BES Collab.)
ABLIKIM	04M	PR D70 112008	M. Ablikim <i>et al.</i>	(BES Collab.)
AUBERT	04	PR D69 011103	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,B	04N	PR D70 072004	B. Aubert <i>et al.</i>	(BABAR Collab.)
BAI	04	PL B578 16	J.Z. Bai <i>et al.</i>	(BES Collab.)
BAI	04A	PR D69 012003	J.Z. Bai <i>et al.</i>	(BES Collab.)
BAI	04D	PL B589 7	J.Z. Bai <i>et al.</i>	(BES Collab.)
BAI	04E	PL B591 42	J.Z. Bai <i>et al.</i>	(BES Collab.)
BAI	04G	PR D70 012004	J.Z. Bai <i>et al.</i>	(BES Collab.)
BAI	04H	PR D70 012005	J.Z. Bai <i>et al.</i>	(BES Collab.)
BAI	04J	PL B594 47	J.Z. Bai <i>et al.</i>	(BES Collab.)
SETH	04	PR D69 097503	K.K. Seth	
AULCHENKO	03	PL B573 63	V.M. Aulchenko <i>et al.</i>	(KEDR Collab.)
BAI	03D	PL B561 49	J.Z. Bai <i>et al.</i>	(BES Collab.)
BAI	03F	PRL 91 022001	J.Z. Bai <i>et al.</i>	(BES II Collab.)
BAI	03G	PR D68 052003	J.Z. Bai <i>et al.</i>	(BES Collab.)
HUANG	03	PRL 91 241802	H.-C. Huang <i>et al.</i>	(BELLE Collab.)
BAI	02C	PRL 88 101802	J.Z. Bai <i>et al.</i>	(BES Collab.)
ARTAMONOV	00	PL B474 427	A.S. Artamonov <i>et al.</i>	
BAI	00	PRL 84 594	J.Z. Bai <i>et al.</i>	(BES Collab.)
BAI	00B	PL B472 200	J.Z. Bai <i>et al.</i>	(BES Collab.)
BAI	00D	PL B476 25	J.Z. Bai <i>et al.</i>	(BES Collab.)
BAI	99	PL B446 356	J.Z. Bai <i>et al.</i>	(BES Collab.)
BAI	99C	PRL 83 1918	J.Z. Bai <i>et al.</i>	(BES Collab.)
BAI	98D	PR D58 092006	J.Z. Bai <i>et al.</i>	(BES Collab.)
BAI	98G	PL B424 213	J.Z. Bai <i>et al.</i>	(BES Collab.)
BAI	98H	PRL 81 1179	J.Z. Bai <i>et al.</i>	(BES Collab.)
BALDINI	98	PL B444 111	R. Baldini <i>et al.</i>	(FENICE Collab.)
ARMSTRONG	96	PR D54 7067	T.A. Armstrong <i>et al.</i>	(E760 Collab.)
BAI	96B	PRL 76 3502	J.Z. Bai <i>et al.</i>	(BES Collab.)
BAI	96C	PRL 77 3959	J.Z. Bai <i>et al.</i>	(BES Collab.)
BAI	96D	PR D54 1221	J.Z. Bai <i>et al.</i>	(BES Collab.)
GRIBUSHIN	96	PR D53 4723	A. Gribushin <i>et al.</i>	(E672 Collab., E706 Collab.)
HASAN	96	PL B388 376	A. Hasan, D.V. Bugg	(BRUN, LOQM)
BAI	95B	PL B355 374	J.Z. Bai <i>et al.</i>	(BES Collab.)
BUGG	95	PL B353 378	D.V. Bugg <i>et al.</i>	(LOQM, PNPI, WASH)
ANTONELLI	93	PL B301 317	A. Antonelli <i>et al.</i>	(FENICE Collab.)
ARMSTRONG	93B	PR D47 772	T.A. Armstrong <i>et al.</i>	(FNAL E760 Collab.)
BARNES	93	PL B309 469	P.D. Barnes <i>et al.</i>	(PS185 Collab.)
AUGUSTIN	92	PR D46 1951	J.E. Augustin, G. Cosme	(DM2 Collab.)
BOLTON	92	PL B278 495	T. Bolton <i>et al.</i>	(Mark III Collab.)
BOLTON	92B	PRL 69 1328	T. Bolton <i>et al.</i>	(Mark III Collab.)

COFFMAN	92	PRL 68 282	D.M. Coffman <i>et al.</i>	(Mark III Collab.)
HSUEH	92	PR D45 R2181	S. Hsueh, S. Palestini	(FNAL, TORI)
BISELLO	91	NP B350 1	D. Bisello <i>et al.</i>	(DM2 Collab.)
AUGUSTIN	90	PR D42 10	J.E. Augustin <i>et al.</i>	(DM2 Collab.)
BAI	90B	PRL 65 1309	Z. Bai <i>et al.</i>	(Mark III Collab.)
BAI	90C	PRL 65 2507	Z. Bai <i>et al.</i>	(Mark III Collab.)
BISELLO	90	PL B241 617	D. Bisello <i>et al.</i>	(DM2 Collab.)
COFFMAN	90	PR D41 1410	D.M. Coffman <i>et al.</i>	(Mark III Collab.)
JOUSSET	90	PR D41 1389	J. Jousset <i>et al.</i>	(DM2 Collab.)
ALEXANDER	89	NP B320 45	J.P. Alexander <i>et al.</i>	(LBL, MICH, SLAC)
AUGUSTIN	89	NP B320 1	J.E. Augustin, G. Cosme	(DM2 Collab.)
BISELLO	89B	PR D39 701	G. Busetto <i>et al.</i>	(DM2 Collab.)
AUGUSTIN	88	PRL 60 2238	J.E. Augustin <i>et al.</i>	(DM2 Collab.)
COFFMAN	88	PR D38 2695	D.M. Coffman <i>et al.</i>	(Mark III Collab.)
FALVARD	88	PR D38 2706	A. Falvard <i>et al.</i>	(CLER, FRAS, LALO+)
AUGUSTIN	87	ZPHY C36 369	J.E. Augustin <i>et al.</i>	(LALO, CLER, FRAS+)
BAGLIN	87	NP B286 592	C. Baglin <i>et al.</i>	(LAPP, CERN, GENO, LYON+)
BALTRUSAIT...	87	PR D35 2077	R.M. Baltrusaitis <i>et al.</i>	(Mark III Collab.)
BECKER	87	PRL 59 186	J.J. Becker <i>et al.</i>	(Mark III Collab.)
BISELLO	87	PL B192 239	D. Bisello <i>et al.</i>	(PADO, CLER, FRAS+)
COHEN	87	RMP 59 1121	E.R. Cohen, B.N. Taylor	(RISC, NBS)
HENRARD	87	NP B292 670	P. Henrard <i>et al.</i>	(CLER, FRAS, LALO+)
PALLIN	87	NP B292 653	D. Pallin <i>et al.</i>	(CLER, FRAS, LALO, PADO)
BALTRUSAIT...	86	PR D33 629	R.M. Baltrusaitis <i>et al.</i>	(Mark III Collab.)
BALTRUSAIT...	86B	PR D33 1222	R.M. Baltrusaitis <i>et al.</i>	(Mark III Collab.)
BALTRUSAIT...	86D	PRL 56 107	R.M. Baltrusaitis	(CIT, UCSC, ILL, SLAC+)
BISELLO	86B	PL B179 294	D. Bisello <i>et al.</i>	(DM2 Collab.)
GAISER	86	PR D34 711	J. Gaiser <i>et al.</i>	(Crystal Ball Collab.)
BALTRUSAIT...	85C	PRL 55 1723	R.M. Baltrusaitis <i>et al.</i>	(CIT, UCSC+)
BALTRUSAIT...	85D	PR D32 566	R.M. Baltrusaitis <i>et al.</i>	(CIT, UCSC+)
KURAEV	85	SJNP 41 466	E.A. Kuraev, V.S. Fadin	(NOVO)
BALTRUSAIT...	84	Translated from YAF 41 733	R.M. Baltrusaitis <i>et al.</i>	(CIT, UCSC+)
EATON	84	PR D29 804	M.W. Eaton <i>et al.</i>	(LBL, SLAC)
BLOOM	83	ARNS 33 143	E.D. Bloom, C. Peck	(SLAC, CIT)
EDWARDS	83B	PRL 51 859	C. Edwards <i>et al.</i>	(CIT, HARV, PRIN+)
FRANKLIN	83	PRL 51 963	M.E.B. Franklin <i>et al.</i>	(LBL, SLAC)
BURKE	82	PRL 49 632	D.L. Burke <i>et al.</i>	(LBL, SLAC)
EDWARDS	82B	PR D25 3065	C. Edwards <i>et al.</i>	(CIT, HARV, PRIN+)
EDWARDS	82D	PRL 48 458	C. Edwards <i>et al.</i>	(CIT, HARV, PRIN+)
Also		ARNS 33 143	E.D. Bloom, C. Peck	(SLAC, CIT)
EDWARDS	82E	PRL 49 259	C. Edwards <i>et al.</i>	(CIT, HARV, PRIN+)
LEMOIGNE	82	PL 113B 509	Y. Lemoigne <i>et al.</i>	(SACL, LOIC, SHMP+)
BESCH	81	ZPHY C8 1	H.J. Besch <i>et al.</i>	(BONN, DESY, MANZ)
GIDAL	81	PL 107B 153	G. Gidal <i>et al.</i>	(SLAC, LBL)
PARTRIDGE	80	PRL 44 712	R. Partridge <i>et al.</i>	(CIT, HARV, PRIN+)
SCHARRE	80	PL 97B 329	D.L. Scharre <i>et al.</i>	(SLAC, LBL)
ZHOLENTZ	80	PL 96B 214	A.A. Zholents <i>et al.</i>	(NOVO)
Also		SJNP 34 814	A.A. Zholents <i>et al.</i>	(NOVO)
BRANDELIK	79C	Translated from YAF 34 1471	R. Brandelik <i>et al.</i>	(DASP Collab.)
ALEXANDER	78	ZPHY C1 233	G. Alexander <i>et al.</i>	(DESY, HAMB, SIEG+)
BESCH	78	PL 78B 347	H.J. Besch <i>et al.</i>	(BONN, DESY, MANZ)
BRANDELIK	78B	PL 74B 292	R. Brandelik <i>et al.</i>	(DASP Collab.)
PERUZZI	78	PR D17 2901	I. Peruzzi <i>et al.</i>	(SLAC, LBL)
BARTEL	77	PL 66B 489	W. Bartel <i>et al.</i>	(DESY, HEIDP)
BURMESTER	77D	PL 72B 135	J. Burmester <i>et al.</i>	(DESY, HAMB, SIEG+)
FELDMAN	77	PRPL 33C 285	G.J. Feldman, M.L. Perl	(LBL, SLAC)
VANNUCCI	77	PR D15 1814	F. Vannucci <i>et al.</i>	(SLAC, LBL)
BARTEL	76	PL 64B 483	W. Bartel <i>et al.</i>	(DESY, HEIDP)
BRAUNSCH...	76	PL 63B 487	W. Braunschweig <i>et al.</i>	(DASP Collab.)
JEAN-MARIE	76	PRL 36 291	B. Jean-Marie <i>et al.</i>	(SLAC, LBL) IG
BALDINI...	75	PL 58B 471	R. Baldini-Celio <i>et al.</i>	(FRAS, ROMA)
BOYARSKI	75	PRL 34 1357	A.M. Boyarski <i>et al.</i>	(SLAC, LBL) JPC
DASP	75	PL 56B 491	W. Braunschweig <i>et al.</i>	(DASP Collab.)
ESPOSITO	75B	LNC 14 73	B. Esposito <i>et al.</i>	(FRAS, NAPL, PADO+)
FORD	75	PRL 34 604	R.L. Ford <i>et al.</i>	(SLAC, PENN)