

$J/\psi(1S)$

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

 $J/\psi(1S)$ MASS

<u>VALUE (MeV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
3096.900±0.006 OUR AVERAGE				
3096.900±0.002±0.006		¹ ANASHIN	15 KEDR	$e^+e^- \rightarrow \text{hadrons}$
3096.89 ±0.09	502	² ARTAMONOV	00 OLYA	$e^+e^- \rightarrow \text{hadrons}$
3096.91 ±0.03 ±0.01		³ 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. ● ● ●				
3096.66 ±0.19 ±0.02	6.1k	⁴ AAIJ	15BI LHCb	$pp \rightarrow J/\psi X$
3096.917±0.010±0.007		AULCHENKO	03 KEDR	$e^+e^- \rightarrow \text{hadrons}$
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	⁵ ZHOLENTZ	80 REDE	e^+e^-
3097.0 ±1		⁶ BRANDELIK	79C DASP	e^+e^-

¹ Supersedes AULCHENKO 03.² Reanalysis of ZHOLENTZ 80 using new electron mass (COHEN 87) and radiative corrections (KURAEV 85).³ Mass central value and systematic error recalculated by us according to Eq. (16) in ARMSTRONG 93B, using the value for the $\psi(2S)$ mass from AULCHENKO 03.⁴ From a sample of $\eta_c(1S)$ and J/ψ produced in b -hadron decays. Systematic uncertainties not estimated.⁵ Superseded by ARTAMONOV 00.⁶ From a simultaneous fit to e^+e^- , $\mu^+\mu^-$ and hadronic channels assuming $\Gamma(e^+e^-) = \Gamma(\mu^+\mu^-)$.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>
92.6 ± 1.7 OUR AVERAGE				
Error includes scale factor of 1.1.				
92.45± 1.40±1.48		¹ ANASHIN	20 KEDR	e^+e^-
96.1 ± 3.2	13k	² ADAMS	06A CLEO	$e^+e^- \rightarrow \mu^+\mu^-\gamma$
84.4 ± 8.9		BAI	95B BES	e^+e^-
91 ±11 ±6		³ ARMSTRONG	93B E760	$\bar{p}p \rightarrow e^+e^-$
85.5 ^{+6.1} _{-5.8}		⁴ HSUEH	92 RVUE	See Υ mini-review
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
92.94± 1.83		^{5,6} ANASHIN	18A KEDR	e^+e^-
94.1 ± 2.7		⁷ ANASHIN	10 KEDR	3.097 $e^+e^- \rightarrow e^+e^-, \mu^+\mu^-$
93.7 ± 3.5	7.8k	² AUBERT	04 BABR	$e^+e^- \rightarrow \mu^+\mu^-\gamma$

¹ Based on the same dataset as ANASHIN 18A and correlated to the values reported there² 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 $B(\mu^+\mu^-) = (5.93 \pm 0.06)\%$.

³The initial-state radiation correction reevaluated by ANDREOTTI 07 in its Ref. [4].

⁴Using data from COFFMAN 92, BALDINI-CELIO 75, BOYARSKI 75, ESPOSITO 75B, BRANDELIK 79c.

⁵Using $\Gamma(e^+e^-)$ from ANASHIN 18A and $B(J/\psi(1S) \rightarrow e^+e^-) = (5.971 \pm 0.032)\%$ from PDG 16.

⁶Superseded by ANASHIN 20 that is based on the same dataset .

⁷Assuming $\Gamma(e^+e^-) = \Gamma(\mu^+\mu^-)$ 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 ggg	(64.1 \pm 1.0) %	
Γ_4 γgg	(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} $\eta\pi^+\pi^-$	(3.8 \pm 0.7) $\times 10^{-4}$	
Γ_{12} $\eta\pi^+\pi^-\pi^0$	(1.17 \pm 0.20) %	
Γ_{13} $\eta\pi^+\pi^-3\pi^0$	(4.9 \pm 1.0) $\times 10^{-3}$	
Γ_{14} $\eta\rho$	(1.93 \pm 0.23) $\times 10^{-4}$	
Γ_{15} $\eta\phi(2170) \rightarrow \eta\phi f_0(980) \rightarrow \eta\phi\pi^+\pi^-$	(1.2 \pm 0.4) $\times 10^{-4}$	
Γ_{16} $\eta\phi(2170) \rightarrow \eta K^*(892)^0 \bar{K}^*(892)^0$	< 2.52 $\times 10^{-4}$	CL=90%
Γ_{17} $\eta K^\pm K_S^0 \pi^\mp$	[b] (2.2 \pm 0.4) $\times 10^{-3}$	
Γ_{18} $\eta K^*(892)^0 \bar{K}^*(892)^0$	(1.15 \pm 0.26) $\times 10^{-3}$	
Γ_{19} $\rho\eta'(958)$	(8.1 \pm 0.8) $\times 10^{-5}$	S=1.6
Γ_{20} $\rho^\pm \pi^\mp \pi^+ \pi^- 2\pi^0$	(2.8 \pm 0.8) %	
Γ_{21} $\rho^+ \rho^- \pi^+ \pi^- \pi^0$	(6 \pm 4) $\times 10^{-3}$	
Γ_{22} $\rho^\mp K^\pm K_S^0$	(1.9 \pm 0.4) $\times 10^{-3}$	
Γ_{23} $\rho(1450)\pi$		
Γ_{24} $\rho(1450)\pi \rightarrow \pi^+\pi^-\pi^0$	(2.3 \pm 0.7) $\times 10^{-3}$	
Γ_{25} $\rho(1450)^\pm \pi^\mp \rightarrow K_S^0 K^\pm \pi^\mp$	(3.5 \pm 0.6) $\times 10^{-4}$	
Γ_{26} $\rho(1450)^0 \pi^0 \rightarrow K^+ K^- \pi^0$	(2.7 \pm 0.6) $\times 10^{-4}$	
Γ_{27} $\rho(1450)\eta'(958) \rightarrow \pi^+\pi^-\eta'(958)$	(3.3 \pm 0.7) $\times 10^{-6}$	
Γ_{28} $\rho(1700)\pi$		
Γ_{29} $\rho(1700)\pi \rightarrow \pi^+\pi^-\pi^0$	(1.7 \pm 1.1) $\times 10^{-4}$	

Γ_{30}	$\rho(2150)\pi$		
Γ_{31}	$\rho(2150)\pi \rightarrow \pi^+\pi^-\pi^0$	$(8 \pm 40) \times 10^{-6}$	
Γ_{32}	$\rho_3(1690)\pi \rightarrow \pi^+\pi^-\pi^0$		
Γ_{33}	$\omega\pi^0$	$(4.5 \pm 0.5) \times 10^{-4}$	S=1.4
Γ_{34}	$\omega\pi^0 \rightarrow \pi^+\pi^-\pi^0$	$(1.7 \pm 0.8) \times 10^{-5}$	
Γ_{35}	$\omega\pi^+\pi^-$	$(7.2 \pm 1.0) \times 10^{-3}$	
Γ_{36}	$\omega\pi^0\pi^0$	$(3.4 \pm 0.8) \times 10^{-3}$	
Γ_{37}	$\omega 3\pi^0$	$(1.9 \pm 0.6) \times 10^{-3}$	
Γ_{38}	$\omega f_2(1270)$	$(4.3 \pm 0.6) \times 10^{-3}$	
Γ_{39}	$\omega\eta$	$(1.74 \pm 0.20) \times 10^{-3}$	S=1.6
Γ_{40}	$\omega\pi^+\pi^-\pi^0$	$(4.0 \pm 0.7) \times 10^{-3}$	
Γ_{41}	$\omega\pi^0\eta$	$(3.4 \pm 1.7) \times 10^{-4}$	
Γ_{42}	$\omega\pi^+\pi^+\pi^-\pi^-$	$(8.5 \pm 3.4) \times 10^{-3}$	
Γ_{43}	$\omega\pi^+\pi^-2\pi^0$	$(3.3 \pm 0.5) \%$	
Γ_{44}	$\omega\eta'\pi^+\pi^-$	$(1.12 \pm 0.13) \times 10^{-3}$	
Γ_{45}	$\omega\eta'(958)$	$(1.89 \pm 0.18) \times 10^{-4}$	
Γ_{46}	$\omega f_0(980)$	$(1.4 \pm 0.5) \times 10^{-4}$	
Γ_{47}	$\omega f_0(1710) \rightarrow \omega K\bar{K}$	$(4.8 \pm 1.1) \times 10^{-4}$	
Γ_{48}	$\omega f_1(1420)$	$(6.8 \pm 2.4) \times 10^{-4}$	
Γ_{49}	$\omega f'_2(1525)$	$< 2.2 \times 10^{-4}$	CL=90%
Γ_{50}	$\omega X(1835) \rightarrow \omega p\bar{p}$	$< 3.9 \times 10^{-6}$	CL=95%
Γ_{51}	$\omega X(1835), X \rightarrow \eta'\pi^+\pi^-$	$< 6.2 \times 10^{-5}$	
Γ_{52}	$\omega K^\pm K_S^0 \pi^\mp$	[b] $(3.4 \pm 0.5) \times 10^{-3}$	
Γ_{53}	$\omega K\bar{K}$	$(1.9 \pm 0.4) \times 10^{-3}$	
Γ_{54}	$\omega K^*(892)\bar{K} + \text{c.c.}$	$(6.1 \pm 0.9) \times 10^{-3}$	
Γ_{55}	$\eta' K^{*\pm} K^\mp$	$(1.48 \pm 0.13) \times 10^{-3}$	
Γ_{56}	$\eta' K^{*0} \bar{K}^0 + \text{c.c.}$	$(1.66 \pm 0.21) \times 10^{-3}$	
Γ_{57}	$\eta' h_1(1415) \rightarrow \eta' K^* \bar{K} + \text{c.c.}$	$(2.16 \pm 0.31) \times 10^{-4}$	
Γ_{58}	$\eta' h_1(1415) \rightarrow \eta' K^{*\pm} K^\mp$	$(1.51 \pm 0.23) \times 10^{-4}$	
Γ_{59}	$\bar{K} K^*(892) + \text{c.c.}$		
Γ_{60}	$\bar{K} K^*(892) + \text{c.c.} \rightarrow K_S^0 K^\pm \pi^\mp$	$(5.0 \pm 0.5) \times 10^{-3}$	
Γ_{61}	$K^+ K^*(892)^- + \text{c.c.}$	$(6.0 \pm_{-1.0}^{0.8}) \times 10^{-3}$	S=2.9
Γ_{62}	$K^+ K^*(892)^- + \text{c.c.} \rightarrow K^+ K^- \pi^0$	$(2.69 \pm_{-0.20}^{0.13}) \times 10^{-3}$	
Γ_{63}	$K^+ K^*(892)^- + \text{c.c.} \rightarrow K^0 K^\pm \pi^\mp + \text{c.c.}$	$(3.0 \pm 0.4) \times 10^{-3}$	
Γ_{64}	$K^0 \bar{K}^*(892)^0 + \text{c.c.}$	$(4.2 \pm 0.4) \times 10^{-3}$	
Γ_{65}	$K^0 \bar{K}^*(892)^0 + \text{c.c.} \rightarrow K^0 K^\pm \pi^\mp + \text{c.c.}$	$(3.2 \pm 0.4) \times 10^{-3}$	
Γ_{66}	$\bar{K}^*(892)^0 K^+ \pi^- + \text{c.c.}$	$(7.7 \pm 1.6) \times 10^{-3}$	
Γ_{67}	$K^*(892)^\pm K^\mp \pi^0$	$(4.1 \pm 1.3) \times 10^{-3}$	
Γ_{68}	$K^*(892)^+ K_S^0 \pi^- + \text{c.c.}$	$(2.0 \pm 0.5) \times 10^{-3}$	

Γ ₆₉	$K^*(892)^+ K_S^0 \pi^- + \text{c.c.} \rightarrow$ $K_S^0 K_S^0 \pi^+ \pi^-$	$(6.7 \pm 2.2) \times 10^{-4}$	
Γ ₇₀	$K^*(892)^0 K_S^0 \rightarrow \gamma K_S^0 K_S^0$	$(6.3 \pm_{-0.5}^{+0.6}) \times 10^{-6}$	
Γ ₇₁	$K^*(892)^0 K_S^0 \pi^0$	$(7 \pm 4) \times 10^{-4}$	
Γ ₇₂	$K^*(892)^\pm K^*(700)^\mp$	$(1.1 \pm_{-0.6}^{+1.0}) \times 10^{-3}$	
Γ ₇₃	$K^*(892)^0 \bar{K}^*(892)^0$	$(2.3 \pm 0.6) \times 10^{-4}$	
Γ ₇₄	$K^*(892)^\pm K^*(892)^\mp$	$(1.00 \pm_{-0.40}^{+0.22}) \times 10^{-3}$	
Γ ₇₅	$K_1(1400)^\pm K^\mp$	$(3.8 \pm 1.4) \times 10^{-3}$	
Γ ₇₆	$K^*(1410) \bar{K} + \text{c.c.}$		
Γ ₇₇	$K^*(1410) \bar{K} + \text{c.c.} \rightarrow$ $K^\pm K^\mp \pi^0$	$(7 \pm 4) \times 10^{-5}$	
Γ ₇₈	$K^*(1410) \bar{K} + \text{c.c.} \rightarrow$ $K_S^0 K^\pm \pi^\mp$	$(8 \pm 6) \times 10^{-5}$	
Γ ₇₉	$K_2^*(1430) \bar{K} + \text{c.c.}$		
Γ ₈₀	$K_2^*(1430) \bar{K} + \text{c.c.} \rightarrow$ $K^\pm K^\mp \pi^0$	$(1.0 \pm 0.5) \times 10^{-4}$	
Γ ₈₁	$K_2^*(1430) \bar{K} + \text{c.c.} \rightarrow$ $K_S^0 K^\pm \pi^\mp$	$(4.0 \pm 1.0) \times 10^{-4}$	
Γ ₈₂	$\bar{K}_2^*(1430) K + \text{c.c.}$	$< 4.0 \times 10^{-3}$	CL=90%
Γ ₈₃	$K_2^*(1430)^+ K^- + \text{c.c.} \rightarrow$ $K^+ K^- \pi^0$	$(2.69 \pm_{-0.19}^{+0.25}) \times 10^{-4}$	
Γ ₈₄	$K_2^*(1430)^+ K_S^0 \pi^- + \text{c.c.}$	$(3.6 \pm 1.8) \times 10^{-3}$	
Γ ₈₅	$\bar{K}_2^*(1430)^0 K^*(892)^0 + \text{c.c.}$	$(4.67 \pm 0.29) \times 10^{-3}$	
Γ ₈₆	$K_2^*(1430)^- K^*(892)^+ + \text{c.c.}$	$(3.4 \pm 2.9) \times 10^{-3}$	
Γ ₈₇	$K_2^*(1430)^- K^*(892)^+ +$ $\text{c.c.} \rightarrow K^*(892)^+ K_S^0 \pi^- +$ c.c.	$(4 \pm 4) \times 10^{-4}$	
Γ ₈₈	$K_2^*(1430)^0 \bar{K}_2^*(1430)^0$	$< 2.9 \times 10^{-3}$	CL=90%
Γ ₈₉	$\bar{K}_2(1770)^0 K^*(892)^0 + \text{c.c.} \rightarrow$ $K^*(892)^0 K^- \pi^+ + \text{c.c.}$	$(6.9 \pm 0.9) \times 10^{-4}$	
Γ ₉₀	$K_2^*(1980)^+ K^- + \text{c.c.} \rightarrow$ $K^+ K^- \pi^0$	$(1.10 \pm_{-0.14}^{+0.60}) \times 10^{-5}$	
Γ ₉₁	$K_4^*(2045)^+ K^- + \text{c.c.} \rightarrow$ $K^+ K^- \pi^0$	$(6.2 \pm_{-1.6}^{+2.9}) \times 10^{-6}$	
Γ ₉₂	$K_1(1270)^\pm K^\mp$	$< 3.0 \times 10^{-3}$	CL=90%
Γ ₉₃	$K_1(1270) K_S^0 \rightarrow \gamma K_S^0 K_S^0$	$(8.5 \pm 2.5) \times 10^{-7}$	
Γ ₉₄	$a_2(1320)^\pm \pi^\mp$	$[b] < 4.3 \times 10^{-3}$	CL=90%
Γ ₉₅	$\phi \pi^0$	$3 \times 10^{-6} \text{ or } 1 \times 10^{-7}$	
Γ ₉₆	$\phi \pi^+ \pi^-$	$(9.4 \pm 1.5) \times 10^{-4}$	S=1.7
Γ ₉₇	$\phi \pi^0 \pi^0$	$(5.0 \pm 1.0) \times 10^{-4}$	
Γ ₉₈	$\phi 2(\pi^+ \pi^-)$	$(1.60 \pm 0.32) \times 10^{-3}$	

Γ_{99}	$\phi\eta$	$(7.4 \pm 0.8) \times 10^{-4}$	S=1.5
Γ_{100}	$\phi\eta'(958)$	$(4.6 \pm 0.5) \times 10^{-4}$	S=2.2
Γ_{101}	$\phi\eta\eta'$	$(2.32 \pm 0.17) \times 10^{-4}$	
Γ_{102}	$\phi f_0(980)$	$(3.2 \pm 0.9) \times 10^{-4}$	S=1.9
Γ_{103}	$\phi f_0(980) \rightarrow \phi\pi^+\pi^-$	$(2.60 \pm 0.34) \times 10^{-4}$	
Γ_{104}	$\phi f_0(980) \rightarrow \phi\pi^0\pi^0$	$(1.8 \pm 0.5) \times 10^{-4}$	
Γ_{105}	$\phi\pi^0 f_0(980) \rightarrow \phi\pi^0\pi^+\pi^-$	$(4.5 \pm 1.0) \times 10^{-6}$	
Γ_{106}	$\phi\pi^0 f_0(980) \rightarrow \phi\pi^0\rho^0\pi^0$	$(1.7 \pm 0.6) \times 10^{-6}$	
Γ_{107}	$\phi f_0(980)\eta \rightarrow \eta\phi\pi^+\pi^-$	$(3.2 \pm 1.0) \times 10^{-4}$	
Γ_{108}	$\phi a_0(980)^0 \rightarrow \phi\eta\pi^0$	$(4.4 \pm 1.4) \times 10^{-6}$	
Γ_{109}	$\phi f_2(1270)$	$(3.2 \pm 0.6) \times 10^{-4}$	
Γ_{110}	$\phi f_1(1285)$	$(2.6 \pm 0.5) \times 10^{-4}$	
Γ_{111}	$\phi f_1(1285) \rightarrow \phi\pi^0 f_0(980) \rightarrow \phi\pi^0\pi^+\pi^-$	$(9.4 \pm 2.8) \times 10^{-7}$	
Γ_{112}	$\phi f_1(1285) \rightarrow \phi\pi^0 f_0(980) \rightarrow \phi 3\pi^0$	$(2.1 \pm 2.2) \times 10^{-7}$	
Γ_{113}	$\phi\eta(1405) \rightarrow \phi\eta\pi^+\pi^-$	$(2.0 \pm 1.0) \times 10^{-5}$	
Γ_{114}	$\phi f_2'(1525)$	$(8 \pm 4) \times 10^{-4}$	S=2.7
Γ_{115}	$\phi X(1835) \rightarrow \phi p\bar{p}$	$< 2.1 \times 10^{-7}$	CL=90%
Γ_{116}	$\phi X(1835) \rightarrow \phi\eta\pi^+\pi^-$	$< 2.8 \times 10^{-4}$	CL=90%
Γ_{117}	$\phi X(1870) \rightarrow \phi\eta\pi^+\pi^-$	$< 6.13 \times 10^{-5}$	CL=90%
Γ_{118}	$\phi K\bar{K}$	$(1.77 \pm 0.16) \times 10^{-3}$	S=1.3
Γ_{119}	$\phi f_0(1710) \rightarrow \phi K\bar{K}$	$(3.6 \pm 0.6) \times 10^{-4}$	
Γ_{120}	$\phi K^+ K^-$	$(8.3 \pm 1.1) \times 10^{-4}$	
Γ_{121}	$\phi K_S^0 K_S^0$	$(5.9 \pm 1.5) \times 10^{-4}$	
Γ_{122}	$\phi K^\pm K_S^0 \pi^\mp$	[b] $(7.2 \pm 0.8) \times 10^{-4}$	
Γ_{123}	$\phi K^*(892)\bar{K} + \text{c.c.}$	$(2.18 \pm 0.23) \times 10^{-3}$	
Γ_{124}	$b_1(1235)^\pm \pi^\mp$	[b] $(3.0 \pm 0.5) \times 10^{-3}$	
Γ_{125}	$b_1(1235)^0 \pi^0$	$(2.3 \pm 0.6) \times 10^{-3}$	
Γ_{126}	$f_2'(1525)K^+ K^-$	$(1.06 \pm 0.35) \times 10^{-3}$	
Γ_{127}	$\Delta(1232)^+ \bar{p}$	$< 1 \times 10^{-4}$	CL=90%
Γ_{128}	$\Delta(1232)^{++} \bar{p}\pi^-$	$(1.6 \pm 0.5) \times 10^{-3}$	
Γ_{129}	$\Delta(1232)^{++} \bar{\Delta}(1232)^{--}$	$(1.10 \pm 0.29) \times 10^{-3}$	
Γ_{130}	$\bar{\Sigma}(1385)^0 p K^-$	$(5.1 \pm 3.2) \times 10^{-4}$	
Γ_{131}	$\Sigma(1385)^0 \bar{\Lambda} + \text{c.c.}$	$< 8.2 \times 10^{-6}$	CL=90%
Γ_{132}	$\Sigma(1385)^- \bar{\Sigma}^+ (\text{or c.c.})$	[b] $(3.1 \pm 0.5) \times 10^{-4}$	
Γ_{133}	$\Sigma(1385)^- \bar{\Sigma}(1385)^+ (\text{or c.c.})$	[b] $(1.16 \pm 0.05) \times 10^{-3}$	
Γ_{134}	$\Sigma(1385)^0 \bar{\Sigma}(1385)^0$	$(1.07 \pm 0.08) \times 10^{-3}$	
Γ_{135}	$\Lambda(1520)\bar{\Lambda} + \text{c.c.} \rightarrow \gamma\Lambda\bar{\Lambda}$	$< 4.1 \times 10^{-6}$	CL=90%
Γ_{136}	$\bar{\Lambda}(1520)\Lambda + \text{c.c.}$	$< 1.80 \times 10^{-3}$	CL=90%
Γ_{137}	$\Xi^0 \Xi^0$	$(1.17 \pm 0.04) \times 10^{-3}$	
Γ_{138}	$\Xi(1530)^- \Xi^+ + \text{c.c.}$	$(3.18 \pm 0.08) \times 10^{-4}$	
Γ_{139}	$\Xi(1530)^0 \Xi^0$	$(3.2 \pm 1.4) \times 10^{-4}$	

Γ_{140}	$\Theta(1540)\bar{\Theta}(1540) \rightarrow$ $K_S^0 p K^- \bar{n} + \text{c.c.}$	$[c] < 1.1$	$\times 10^{-5}$	CL=90%
Γ_{141}	$\Theta(1540)K^- \bar{n} \rightarrow K_S^0 p K^- \bar{n}$	$[c] < 2.1$	$\times 10^{-5}$	CL=90%
Γ_{142}	$\Theta(1540)K_S^0 \bar{p} \rightarrow K_S^0 \bar{p} K^+ n$	$[c] < 1.6$	$\times 10^{-5}$	CL=90%
Γ_{143}	$\bar{\Theta}(1540)K^+ n \rightarrow K_S^0 \bar{p} K^+ n$	$[c] < 5.6$	$\times 10^{-5}$	CL=90%
Γ_{144}	$\bar{\Theta}(1540)K_S^0 p \rightarrow K_S^0 p K^- \bar{n}$	$[c] < 1.1$	$\times 10^{-5}$	CL=90%

Decays into stable hadrons

Γ_{145}	$2(\pi^+ \pi^-)\pi^0$	$(3.71 \pm 0.28) \%$		S=1.3
Γ_{146}	$3(\pi^+ \pi^-)\pi^0$	$(2.9 \pm 0.6) \%$		
Γ_{147}	$\pi^+ \pi^- 3\pi^0$	$(1.9 \pm 0.9) \%$		
Γ_{148}	$\pi^+ \pi^- 4\pi^0$	$(6.5 \pm 1.3) \times 10^{-3}$		
Γ_{149}	$\rho^\pm \pi^\mp \pi^0 \pi^0$	$(1.41 \pm 0.22) \%$		
Γ_{150}	$\rho^+ \rho^- \pi^0$	$(6.0 \pm 1.1) \times 10^{-3}$		
Γ_{151}	$\pi^+ \pi^- \pi^0$	$(2.10 \pm 0.08) \%$		S=1.6
Γ_{152}	$2(\pi^+ \pi^- \pi^0)$	$(1.61 \pm 0.20) \%$		
Γ_{153}	$\pi^+ \pi^- \pi^0 K^+ K^-$	$(1.20 \pm 0.30) \%$		
Γ_{154}	$\pi^+ \pi^-$	$(1.47 \pm 0.14) \times 10^{-4}$		
Γ_{155}	$2(\pi^+ \pi^-)$	$(3.57 \pm 0.30) \times 10^{-3}$		
Γ_{156}	$3(\pi^+ \pi^-)$	$(4.3 \pm 0.4) \times 10^{-3}$		
Γ_{157}	$2(\pi^+ \pi^-) 3\pi^0$	$(6.2 \pm 0.9) \%$		
Γ_{158}	$4(\pi^+ \pi^-)\pi^0$	$(9.0 \pm 3.0) \times 10^{-3}$		
Γ_{159}	$2(\pi^+ \pi^-)\eta$	$(2.29 \pm 0.28) \times 10^{-3}$		
Γ_{160}	$3(\pi^+ \pi^-)\eta$	$(7.2 \pm 1.5) \times 10^{-4}$		
Γ_{161}	$2(\pi^+ \pi^- \pi^0)\eta$	$(1.6 \pm 0.5) \times 10^{-3}$		
Γ_{162}	$\pi^+ \pi^- \pi^0 \pi^0 \eta$	$(2.4 \pm 0.5) \times 10^{-3}$		
Γ_{163}	$\rho^\pm \pi^\mp \pi^0 \eta$	$(1.9 \pm 0.8) \times 10^{-3}$		
Γ_{164}	$K^+ K^-$	$(2.86 \pm 0.21) \times 10^{-4}$		
Γ_{165}	$K_S^0 K_L^0$	$(1.95 \pm 0.11) \times 10^{-4}$		S=2.4
Γ_{166}	$K_S^0 K_S^0$	$< 1.4 \times 10^{-8}$		CL=95%
Γ_{167}	$K \bar{K} \pi$	$(6.1 \pm 1.0) \times 10^{-3}$		
Γ_{168}	$K^+ K^- \pi^0$	$(2.88 \pm 0.12) \times 10^{-3}$		
Γ_{169}	$K_S^0 K^\pm \pi^\mp$	$(5.6 \pm 0.5) \times 10^{-3}$		
Γ_{170}	$K_S^0 K_L^0 \pi^0$	$(2.06 \pm 0.26) \times 10^{-3}$		
Γ_{171}	$K^*(892)^0 \bar{K}^0 + \text{c.c.} \rightarrow$ $K_S^0 K_L^0 \pi^0$	$(1.21 \pm 0.18) \times 10^{-3}$		
Γ_{172}	$K_2^*(1430)^0 \bar{K}^0 + \text{c.c.} \rightarrow$ $K_S^0 K_L^0 \pi^0$	$(4.3 \pm 1.3) \times 10^{-4}$		
Γ_{173}	$K^+ K^- \pi^+ \pi^-$	$(6.86 \pm 0.28) \times 10^{-3}$		
Γ_{174}	$K^+ K^- \pi^0 \pi^0$	$(2.13 \pm 0.22) \times 10^{-3}$		
Γ_{175}	$K_S^0 K_L^0 \pi^+ \pi^-$	$(3.8 \pm 0.6) \times 10^{-3}$		
Γ_{176}	$K_S^0 K_L^0 \pi^0 \pi^0$	$(1.9 \pm 0.4) \times 10^{-3}$		
Γ_{177}	$K_S^0 K_L^0 \eta$	$(1.45 \pm 0.33) \times 10^{-3}$		

Γ_{178}	$K_S^0 K_S^0 \pi^+ \pi^-$	$(1.68 \pm 0.19) \times 10^{-3}$	
Γ_{179}	$K_S^\mp K_S^0 \pi^\pm \pi^0$	$(5.7 \pm 0.5) \times 10^{-3}$	
Γ_{180}	$K^+ K^- 2(\pi^+ \pi^-)$	$(3.1 \pm 1.3) \times 10^{-3}$	
Γ_{181}	$K^+ K^- \pi^+ \pi^- \eta$	$(4.7 \pm 0.7) \times 10^{-3}$	
Γ_{182}	$2(K^+ K^-)$	$(7.2 \pm 0.8) \times 10^{-4}$	
Γ_{183}	$K^+ K^- K_S^0 K_S^0$	$(4.2 \pm 0.7) \times 10^{-4}$	
Γ_{184}	$\rho \bar{\rho}$	$(2.120 \pm 0.029) \times 10^{-3}$	
Γ_{185}	$\rho \bar{\rho} \pi^0$	$(1.19 \pm 0.08) \times 10^{-3}$	S=1.1
Γ_{186}	$\rho \bar{\rho} \pi^+ \pi^-$	$(6.0 \pm 0.5) \times 10^{-3}$	S=1.3
Γ_{187}	$\rho \bar{\rho} \pi^+ \pi^- \pi^0$	[d] $(2.3 \pm 0.9) \times 10^{-3}$	S=1.9
Γ_{188}	$\rho \bar{\rho} \eta$	$(2.00 \pm 0.12) \times 10^{-3}$	
Γ_{189}	$\rho \bar{\rho} \rho$	< 3.1 $\times 10^{-4}$	CL=90%
Γ_{190}	$\rho \bar{\rho} \omega$	$(9.8 \pm 1.0) \times 10^{-4}$	S=1.3
Γ_{191}	$\rho \bar{\rho} \eta'(958)$	$(1.29 \pm 0.14) \times 10^{-4}$	S=2.0
Γ_{192}	$\rho \bar{\rho} a_0(980) \rightarrow \rho \bar{\rho} \pi^0 \eta$	$(6.8 \pm 1.8) \times 10^{-5}$	
Γ_{193}	$\rho \bar{\rho} \phi$	$(5.19 \pm 0.33) \times 10^{-5}$	
Γ_{194}	$\rho \bar{n} \pi^-$	$(2.12 \pm 0.09) \times 10^{-3}$	
Γ_{195}	$n \bar{n}$	$(2.09 \pm 0.16) \times 10^{-3}$	
Γ_{196}	$n \bar{n} \pi^+ \pi^-$	$(4 \pm 4) \times 10^{-3}$	
Γ_{197}	$n N(1440)$	seen	
Γ_{198}	$n N(1520)$	seen	
Γ_{199}	$n N(1535)$	seen	
Γ_{200}	$\Lambda \bar{\Lambda}$	$(1.89 \pm 0.09) \times 10^{-3}$	S=2.8
Γ_{201}	$\Lambda \bar{\Lambda} \pi^0$	$(3.8 \pm 0.4) \times 10^{-5}$	
Γ_{202}	$\Lambda \bar{\Lambda} \pi^+ \pi^-$	$(4.3 \pm 1.0) \times 10^{-3}$	
Γ_{203}	$\Lambda \bar{\Lambda} \eta$	$(1.62 \pm 0.17) \times 10^{-4}$	
Γ_{204}	$\Lambda \bar{\Sigma}^- \pi^+$ (or c.c.)	[b] $(8.3 \pm 0.7) \times 10^{-4}$	S=1.2
Γ_{205}	$\rho K^- \bar{\Lambda} + \text{c.c.}$	$(8.6 \pm 1.1) \times 10^{-4}$	
Γ_{206}	$\rho K^- \bar{\Sigma}^0$	$(2.9 \pm 0.8) \times 10^{-4}$	
Γ_{207}	$\bar{\Lambda} n K_S^0 + \text{c.c.}$	$(6.5 \pm 1.1) \times 10^{-4}$	
Γ_{208}	$\Lambda \bar{\Sigma} + \text{c.c.}$	$(2.83 \pm 0.23) \times 10^{-5}$	
Γ_{209}	$\Sigma^+ \bar{\Sigma}^-$	$(1.07 \pm 0.04) \times 10^{-3}$	
Γ_{210}	$\Sigma^0 \bar{\Sigma}^0$	$(1.172 \pm 0.032) \times 10^{-3}$	S=1.4
Γ_{211}	$\Xi^- \bar{\Xi}^+$	$(9.7 \pm 0.8) \times 10^{-4}$	S=1.4

Radiative decays

Γ_{212}	$\gamma \eta_c(1S)$	$(1.7 \pm 0.4) \%$	S=1.5
Γ_{213}	$\gamma \eta_c(1S) \rightarrow 3\gamma$	$(3.8 \pm 1.3) \times 10^{-6}$	S=1.1
Γ_{214}	$\gamma \eta_c(1S) \rightarrow \gamma \eta \eta'$	$(4.9 \pm 0.8) \times 10^{-5}$	
Γ_{215}	3γ	$(1.16 \pm 0.22) \times 10^{-5}$	
Γ_{216}	4γ	< 9 $\times 10^{-6}$	CL=90%
Γ_{217}	5γ	< 1.5 $\times 10^{-5}$	CL=90%
Γ_{218}	$\gamma \pi^0$	$(3.56 \pm 0.17) \times 10^{-5}$	
Γ_{219}	$\gamma \pi^0 \pi^0$	$(1.15 \pm 0.05) \times 10^{-3}$	

Γ_{220}	$\gamma 2\pi^+ 2\pi^-$	$(2.8 \pm 0.5) \times 10^{-3}$	S=1.9
Γ_{221}	$\gamma f_2(1270) f_2(1270)$	$(9.5 \pm 1.7) \times 10^{-4}$	
Γ_{222}	$\gamma f_2(1270) f_2(1270)$ (non resonant)	$(8.2 \pm 1.9) \times 10^{-4}$	
Γ_{223}	$\gamma \pi^+ \pi^- 2\pi^0$	$(8.3 \pm 3.1) \times 10^{-3}$	
Γ_{224}	$\gamma K_S^0 K_S^0$	$(8.1 \pm 0.4) \times 10^{-4}$	
Γ_{225}	$\gamma (K \bar{K} \pi) [J^{PC} = 0^{-+}]$	$(7 \pm 4) \times 10^{-4}$	S=2.1
Γ_{226}	$\gamma K^+ K^- \pi^+ \pi^-$	$(2.1 \pm 0.6) \times 10^{-3}$	
Γ_{227}	$\gamma K^*(892) \bar{K}^*(892)$	$(4.0 \pm 1.3) \times 10^{-3}$	
Γ_{228}	$\gamma \eta$	$(1.085 \pm 0.018) \times 10^{-3}$	
Γ_{229}	$\gamma \eta \pi^0$	$(2.14 \pm 0.31) \times 10^{-5}$	
Γ_{230}	$\gamma f_0(500) \rightarrow \gamma \pi \pi$		
Γ_{231}	$\gamma f_0(500) \rightarrow \gamma K \bar{K}$		
Γ_{232}	$\gamma f_0(500) \rightarrow \gamma \eta \eta$		
Γ_{233}	$\gamma a_0(980)^0 \rightarrow \gamma \eta \pi^0$	$< 2.5 \times 10^{-6}$	CL=95%
Γ_{234}	$\gamma a_2(1320)^0 \rightarrow \gamma \eta \pi^0$	$< 6.6 \times 10^{-6}$	CL=95%
Γ_{235}	$\gamma \eta \pi \pi$	$(6.1 \pm 1.0) \times 10^{-3}$	
Γ_{236}	$\gamma \eta_2(1870) \rightarrow \gamma \eta \pi^+ \pi^-$	$(6.2 \pm 2.4) \times 10^{-4}$	
Γ_{237}	$\gamma \eta'(958)$	$(5.25 \pm 0.07) \times 10^{-3}$	S=1.3
Γ_{238}	$\gamma f_0(980) \rightarrow \gamma \pi \pi$		
Γ_{239}	$\gamma f_0(980) \rightarrow \gamma K \bar{K}$		
Γ_{240}	$\gamma \rho \rho$	$(4.5 \pm 0.8) \times 10^{-3}$	
Γ_{241}	$\gamma \rho \omega$	$< 5.4 \times 10^{-4}$	CL=90%
Γ_{242}	$\gamma \rho \phi$	$< 8.8 \times 10^{-5}$	CL=90%
Γ_{243}	$\gamma \omega \omega$	$(1.61 \pm 0.33) \times 10^{-3}$	
Γ_{244}	$\gamma \phi \phi$	$(4.0 \pm 1.2) \times 10^{-4}$	S=2.1
Γ_{245}	$\gamma \eta(1405/1475) \rightarrow \gamma K \bar{K} \pi$	$(2.8 \pm 0.6) \times 10^{-3}$	S=1.6
Γ_{246}	$\gamma \eta(1405/1475) \rightarrow \gamma \gamma \rho^0$	$(7.8 \pm 2.0) \times 10^{-5}$	S=1.8
Γ_{247}	$\gamma \eta(1405/1475) \rightarrow \gamma \eta \pi^+ \pi^-$	$(3.0 \pm 0.5) \times 10^{-4}$	
Γ_{248}	$\gamma \eta(1405/1475) \rightarrow \gamma \rho^0 \rho^0$	$(1.7 \pm 0.4) \times 10^{-3}$	S=1.3
Γ_{249}	$\gamma \eta(1405/1475) \rightarrow \gamma \gamma \phi$	$< 8.2 \times 10^{-5}$	CL=95%
Γ_{250}	$\gamma \eta(1405) \rightarrow \gamma \gamma \gamma$	$< 2.63 \times 10^{-6}$	CL=90%
Γ_{251}	$\gamma \eta(1475) \rightarrow \gamma \gamma \gamma$	$< 1.86 \times 10^{-6}$	CL=90%
Γ_{252}	$\gamma \eta(1760) \rightarrow \gamma \rho^0 \rho^0$	$(1.3 \pm 0.9) \times 10^{-4}$	
Γ_{253}	$\gamma \eta(1760) \rightarrow \gamma \omega \omega$	$(1.98 \pm 0.33) \times 10^{-3}$	
Γ_{254}	$\gamma \eta(1760) \rightarrow \gamma \gamma \gamma$	$< 4.80 \times 10^{-6}$	CL=90%
Γ_{255}	$\gamma \eta(2225)$	$(3.14 \pm_{-0.19}^{+0.50}) \times 10^{-4}$	
Γ_{256}	$\gamma f_2(1270)$	$(1.64 \pm 0.12) \times 10^{-3}$	S=1.3
Γ_{257}	$\gamma f_2(1270) \rightarrow \gamma K_S^0 K_S^0$	$(2.58 \pm_{-0.22}^{+0.60}) \times 10^{-5}$	
Γ_{258}	$\gamma f_1(1285)$	$(6.1 \pm 0.8) \times 10^{-4}$	
Γ_{259}	$\gamma f_0(1370) \rightarrow \gamma \pi \pi$		
Γ_{260}	$\gamma f_0(1370) \rightarrow \gamma K \bar{K}$	$(4.2 \pm 1.5) \times 10^{-4}$	
Γ_{261}	$\gamma f_0(1370) \rightarrow \gamma K_S^0 K_S^0$	$(1.1 \pm 0.4) \times 10^{-5}$	

Γ_{262}	$\gamma f_0(1370) \rightarrow \gamma \eta \eta$		
Γ_{263}	$\gamma f_0(1370) \rightarrow \gamma \eta \eta'$		
Γ_{264}	$\gamma f_1(1420) \rightarrow \gamma K \bar{K} \pi$	$(7.9 \pm 1.3) \times 10^{-4}$	
Γ_{265}	$\gamma f_0(1500) \rightarrow \gamma \pi \pi$	$(1.09 \pm 0.24) \times 10^{-4}$	
Γ_{266}	$\gamma f_0(1500) \rightarrow \gamma \eta \eta$	$(1.7 \begin{smallmatrix} + 0.6 \\ - 1.4 \end{smallmatrix}) \times 10^{-5}$	
Γ_{267}	$\gamma f_0(1500) \rightarrow \gamma K_S^0 K_S^0$	$(1.59 \begin{smallmatrix} + 0.24 \\ - 0.60 \end{smallmatrix}) \times 10^{-5}$	
Γ_{268}	$\gamma f_0(1500) \rightarrow \gamma \eta \eta'$		
Γ_{269}	$\gamma f_1(1510) \rightarrow \gamma \eta \pi^+ \pi^-$	$(4.5 \pm 1.2) \times 10^{-4}$	
Γ_{270}	$\gamma f_2'(1525)$	$(5.7 \begin{smallmatrix} + 0.8 \\ - 0.5 \end{smallmatrix}) \times 10^{-4}$	S=1.5
Γ_{271}	$\gamma f_2'(1525) \rightarrow \gamma K_S^0 K_S^0$	$(8.0 \begin{smallmatrix} + 0.7 \\ - 0.5 \end{smallmatrix}) \times 10^{-5}$	
Γ_{272}	$\gamma f_2'(1525) \rightarrow \gamma \eta \eta$	$(3.4 \pm 1.4) \times 10^{-5}$	
Γ_{273}	$\gamma f_2(1640) \rightarrow \gamma \omega \omega$	$(2.8 \pm 1.8) \times 10^{-4}$	
Γ_{274}	$\gamma f_0(1710) \rightarrow \gamma \pi \pi$	$(3.8 \pm 0.5) \times 10^{-4}$	
Γ_{275}	$\gamma f_0(1710) \rightarrow \gamma K \bar{K}$	$(9.5 \begin{smallmatrix} + 1.0 \\ - 0.5 \end{smallmatrix}) \times 10^{-4}$	S=1.5
Γ_{276}	$\gamma f_0(1710) \rightarrow \gamma \omega \omega$	$(3.1 \pm 1.0) \times 10^{-4}$	
Γ_{277}	$\gamma f_0(1710) \rightarrow \gamma \eta \eta$	$(2.4 \begin{smallmatrix} + 1.2 \\ - 0.7 \end{smallmatrix}) \times 10^{-4}$	
Γ_{278}	$\gamma f_0(1710) \rightarrow \gamma \eta \eta'$		
Γ_{279}	$\gamma f_0(1710) \rightarrow \gamma \omega \phi$	$(2.5 \pm 0.6) \times 10^{-4}$	
Γ_{280}	$\gamma f_0(1750) \rightarrow \gamma K_S^0 K_S^0$	$(1.11 \begin{smallmatrix} + 0.20 \\ - 0.33 \end{smallmatrix}) \times 10^{-5}$	
Γ_{281}	$\gamma f_2(1810) \rightarrow \gamma \eta \eta$	$(5.4 \begin{smallmatrix} + 3.5 \\ - 2.4 \end{smallmatrix}) \times 10^{-5}$	
Γ_{282}	$\gamma f_2(1910) \rightarrow \gamma \omega \omega$	$(2.0 \pm 1.4) \times 10^{-4}$	
Γ_{283}	$\gamma f_2(1950) \rightarrow$ $\gamma K^*(892) \bar{K}^*(892)$	$(7.0 \pm 2.2) \times 10^{-4}$	
Γ_{284}	$\gamma f_0(2020) \rightarrow \gamma \pi \pi$		
Γ_{285}	$\gamma f_0(2020) \rightarrow \gamma K \bar{K}$		
Γ_{286}	$\gamma f_0(2020) \rightarrow \gamma \eta \eta$		
Γ_{287}	$\gamma f_4(2050)$	$(2.7 \pm 0.7) \times 10^{-3}$	
Γ_{288}	$\gamma f_0(2100) \rightarrow \gamma \eta \eta$	$(1.13 \begin{smallmatrix} + 0.60 \\ - 0.30 \end{smallmatrix}) \times 10^{-4}$	
Γ_{289}	$\gamma f_0(2100) \rightarrow \gamma K \bar{K}$		
Γ_{290}	$\gamma f_0(2100) \rightarrow \gamma \pi \pi$	$(6.2 \pm 1.0) \times 10^{-4}$	
Γ_{291}	$\gamma f_0(2200)$		
Γ_{292}	$\gamma f_0(2200) \rightarrow \gamma K \bar{K}$	$(5.9 \pm 1.3) \times 10^{-4}$	
Γ_{293}	$\gamma f_0(2200) \rightarrow \gamma K_S^0 K_S^0$	$(2.72 \begin{smallmatrix} + 0.19 \\ - 0.50 \end{smallmatrix}) \times 10^{-4}$	
Γ_{294}	$\gamma f_0(2200) \rightarrow \gamma \pi \pi$		
Γ_{295}	$\gamma f_0(2200) \rightarrow \gamma \eta \eta$		
Γ_{296}	$\gamma f_J(2220)$		
Γ_{297}	$\gamma f_J(2220) \rightarrow \gamma \pi \pi$	< 3.9	$\times 10^{-5}$ CL=90%
Γ_{298}	$\gamma f_J(2220) \rightarrow \gamma K \bar{K}$	< 4.1	$\times 10^{-5}$ CL=90%

Γ_{299}	$\gamma f_J(2220) \rightarrow \gamma p \bar{p}$	$(1.5 \pm 0.8) \times 10^{-5}$	
Γ_{300}	$\gamma f_0(2330) \rightarrow \gamma K_S^0 K_S^0$	$(4.9 \pm 0.7) \times 10^{-5}$	
Γ_{301}	$\gamma f_0(2330) \rightarrow \gamma \pi \pi$		
Γ_{302}	$\gamma f_0(2330) \rightarrow \gamma \eta \eta$		
Γ_{303}	$\gamma f_2(2340) \rightarrow \gamma \eta \eta$	$(5.6 \pm_{-2.2}^{+2.4}) \times 10^{-5}$	
Γ_{304}	$\gamma f_2(2340) \rightarrow \gamma K_S^0 K_S^0$	$(5.5 \pm_{-1.5}^{+4.0}) \times 10^{-5}$	
Γ_{305}	$\gamma X(1835) \rightarrow \gamma \pi^+ \pi^- \eta'$	$(2.7 \pm_{-0.8}^{+0.6}) \times 10^{-4}$	S=1.6
Γ_{306}	$\gamma X(1835) \rightarrow \gamma p \bar{p}$	$(7.7 \pm_{-0.9}^{+1.5}) \times 10^{-5}$	
Γ_{307}	$\gamma X(1835) \rightarrow \gamma K_S^0 K_S^0 \eta$	$(3.3 \pm_{-1.3}^{+2.0}) \times 10^{-5}$	
Γ_{308}	$\gamma X(1835) \rightarrow \gamma \gamma \phi(1020)$		
Γ_{309}	$\gamma X(1835) \rightarrow \gamma \gamma \gamma$	< 3.56	$\times 10^{-6}$ CL=90%
Γ_{310}	$\gamma X(1835) \rightarrow \gamma 3(\pi^+ \pi^-)$	$(2.4 \pm_{-0.8}^{+0.7}) \times 10^{-5}$	
Γ_{311}	$\gamma X(2370) \rightarrow \gamma K^+ K^- \eta'$	$(1.8 \pm 0.7) \times 10^{-5}$	
Γ_{312}	$\gamma X(2370) \rightarrow \gamma K_S^0 K_S^0 \eta'$	$(1.2 \pm 0.5) \times 10^{-5}$	
Γ_{313}	$\gamma X(2370) \rightarrow \gamma \eta \eta \eta'$	< 9.2	$\times 10^{-6}$ CL=90%
Γ_{314}	$\gamma p \bar{p}$	$(3.8 \pm 1.0) \times 10^{-4}$	
Γ_{315}	$\gamma p \bar{p} \pi^+ \pi^-$	< 7.9	$\times 10^{-4}$ CL=90%
Γ_{316}	$\gamma \Lambda \bar{\Lambda}$	< 1.3	$\times 10^{-4}$ CL=90%
Γ_{317}	$\gamma A \rightarrow \gamma$ invisible	[e] < 1.7	$\times 10^{-6}$ CL=90%
Γ_{318}	$\gamma A^0 \rightarrow \gamma \mu^+ \mu^-$	[f] < 5	$\times 10^{-6}$ CL=90%

Dalitz decays

Γ_{319}	$\pi^0 e^+ e^-$	$(7.6 \pm 1.4) \times 10^{-7}$	
Γ_{320}	$\eta e^+ e^-$	$(1.42 \pm 0.08) \times 10^{-5}$	
Γ_{321}	$\eta'(958) e^+ e^-$	$(6.59 \pm 0.18) \times 10^{-5}$	
Γ_{322}	$\eta U \rightarrow \eta e^+ e^-$	[g] < 9.11	$\times 10^{-7}$ CL=90%
Γ_{323}	$\eta'(958) U \rightarrow \eta'(958) e^+ e^-$	[g] < 2.0	$\times 10^{-7}$ CL=90%
Γ_{324}	$\phi e^+ e^-$	< 1.2	$\times 10^{-7}$ CL=90%

Weak decays

Γ_{325}	$D^- e^+ \nu_e + \text{c.c.}$	< 7.1	$\times 10^{-8}$ CL=90%
Γ_{326}	$\bar{D}^0 e^+ e^- + \text{c.c.}$	< 8.5	$\times 10^{-8}$ CL=90%
Γ_{327}	$D_s^- e^+ \nu_e + \text{c.c.}$	< 1.3	$\times 10^{-6}$ CL=90%
Γ_{328}	$D_s^{*-} e^+ \nu_e + \text{c.c.}$	< 1.8	$\times 10^{-6}$ CL=90%
Γ_{329}	$D^- \pi^+ + \text{c.c.}$	< 7.5	$\times 10^{-5}$ CL=90%
Γ_{330}	$\bar{D}^0 \bar{K}^0 + \text{c.c.}$	< 1.7	$\times 10^{-4}$ CL=90%
Γ_{331}	$\bar{D}^0 \bar{K}^{*0} + \text{c.c.}$	< 2.5	$\times 10^{-6}$ CL=90%
Γ_{332}	$D_s^- \pi^+ + \text{c.c.}$	< 1.3	$\times 10^{-4}$ CL=90%
Γ_{333}	$D_s^- \rho^+ + \text{c.c.}$	< 1.3	$\times 10^{-5}$ CL=90%

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

Γ_{334}	$\gamma\gamma$	C	< 2.7	$\times 10^{-7}$	CL=90%
Γ_{335}	$\gamma\phi$	C	< 1.4	$\times 10^{-6}$	CL=90%
Γ_{336}	$e^\pm\mu^\mp$	LF	< 1.6	$\times 10^{-7}$	CL=90%
Γ_{337}	$e^\pm\tau^\mp$	LF	< 7.5	$\times 10^{-8}$	CL=90%
Γ_{338}	$\mu^\pm\tau^\mp$	LF	< 2.0	$\times 10^{-6}$	CL=90%
Γ_{339}	$\Lambda_c^+ e^- + c.c.$		< 6.9	$\times 10^{-8}$	CL=90%

Other decays

Γ_{340}	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] $\Theta(1540)$ is a hypothetical pentaquark state of 1.54 GeV/c² mass and a width of less than 25 MeV/c².

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

[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.

[g] For a dark photon U with mass between 100 and 2100 MeV.

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

$\Gamma(\text{hadrons})$

Γ_1

<u>VALUE (keV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$81.37 \pm 1.36 \pm 1.30$	¹ ANASHIN	20	KEDR e^+e^-
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
74.1 \pm 8.1	BAI	95B	BES e^+e^-
59 \pm 24	BALDINI-...	75	FRAG e^+e^-
59 \pm 14	BOYARSKI	75	MRK1 e^+e^-
50 \pm 25	ESPOSITO	75B	FRAM e^+e^-

¹ Based on the same dataset as ANASHIN 18A and correlated to the values reported there

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

Γ_5

<u>VALUE (keV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
5.53 ± 0.10	OUR AVERAGE			
$5.550 \pm 0.056 \pm 0.089$		^{1,2} ANASHIN	18A	KEDR e^+e^-
$5.36^{+0.29}_{-0.28}$		³ HSUEH	92	RVUE See Υ mini-review
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
$5.58 \pm 0.05 \pm 0.08$		⁴ ABLIKIM	16Q	BES3 $3.773 e^+e^- \rightarrow \mu^+\mu^-\gamma$
5.71 ± 0.16	13k	⁵ ADAMS	06A	CLEO $e^+e^- \rightarrow \mu^+\mu^-\gamma$
5.57 ± 0.19	7.8k	⁵ AUBERT	04	BABR $e^+e^- \rightarrow \mu^+\mu^-\gamma$

5.14 ±0.39	BAI	95B	BES	e^+e^-
4.72 ±0.35	ALEXANDER	89	RVUE	See Υ mini-review
4.4 ±0.6	³ BRANDELIK	79C	DASP	e^+e^-
4.6 ±0.8	⁶ BALDINI-...	75	FRAG	e^+e^-
4.8 ±0.6	BOYARSKI	75	MRK1	e^+e^-
4.6 ±1.0	ESPOSITO	75B	FRAM	e^+e^-

¹ From the cross sections of $e^+e^- \rightarrow e^+e^-$ and $e^+e^- \rightarrow$ hadrons near the $J/\psi(1S)$ peak.

² Based on the same dataset as ANASHIN 20 and correlated to the values reported there.

³ From a simultaneous fit to e^+e^- , $\mu^+\mu^-$, and hadronic channels assuming $\Gamma(e^+e^-) = \Gamma(\mu^+\mu^-)$.

⁴ Using $B(J/\psi \rightarrow \mu^+\mu^-) = (5.973 \pm 0.007 \pm 0.037)\%$ from ABLIKIM 13R.

⁵ Calculated by us from the reported values of $\Gamma(e^+e^-) \times B(\mu^+\mu^-)$ using $B(\mu^+\mu^-) = (5.93 \pm 0.06)\%$.

⁶ Assuming equal partial widths for e^+e^- and $\mu^+\mu^-$.

$\Gamma(\mu^+\mu^-)$ Γ_7

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

$\Gamma(\gamma\gamma)$ Γ_{334}

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

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

This combination of a partial width with the partial width into e^+e^- and with the total width is obtained from the integrated cross section into channel(I) in the e^+e^- annihilation.

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

VALUE (keV)	DOCUMENT ID	TECN	COMMENT
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
4.884±0.048±0.078	^{1,2} ANASHIN	18A	KEDR e^+e^-
4 ±0.8	³ BALDINI-...	75	FRAG e^+e^-
3.9 ±0.8	³ ESPOSITO	75B	FRAM e^+e^-

¹ From the cross sections of $e^+e^- \rightarrow e^+e^-$ and $e^+e^- \rightarrow$ hadrons near the $J/\psi(1S)$ peak.

² Based on the same dataset as ANASHIN 20 and correlated to the values reported there.

³ Data redundant with branching ratios or partial widths above.

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

VALUE (eV)	DOCUMENT ID	TECN	COMMENT
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
333.1± 6.6±4.0	^{1,2} ANASHIN	18A	KEDR e^+e^-

332.3 ± 6.4 ± 4.8		ANASHIN	10	KEDR	3.097 $e^+e^- \rightarrow e^+e^-$
350 ± 20		BRANDELIK	79C	DASP	e^+e^-
320 ± 70		³ BALDINI-...	75	FRAG	e^+e^-
340 ± 90		³ ESPOSITO	75B	FRAM	e^+e^-
360 ± 100		³ FORD	75	SPEC	e^+e^-

¹ From the cross sections of $e^+e^- \rightarrow e^+e^-$ and $e^+e^- \rightarrow$ hadrons near the $J/\psi(1S)$ peak.

² Based on the same dataset as ANASHIN 20 and correlated to the values reported there.

³ Data redundant with branching ratios or partial widths above.

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

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
333 ± 4 OUR AVERAGE				
333.4 ± 2.5 ± 4.4		ABLIKIM	16Q	BES3 $e^+e^- \rightarrow \mu^+\mu^-\gamma$
331.8 ± 5.2 ± 6.3		ANASHIN	10	KEDR $e^+e^- \rightarrow \mu^+\mu^-$
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.

$\Gamma(\eta\pi^+\pi^-) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ $\Gamma_{11}\Gamma_5/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
2.3 ± 0.4 OUR AVERAGE				
2.34 ± 0.43 ± 0.16	49	LEES	18	BABR $e^+e^- \rightarrow \eta\pi^+\pi^-\gamma$
2.22 ± 0.96 ± 0.02	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 $B(\eta \rightarrow \pi^+\pi^-\pi^0) = (23.02 \pm 0.25) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

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

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
64.8 ± 11.1 ± 0.4	200	¹ LEES	21C	BABR $e^+e^- \rightarrow \gamma_{ISR}(\pi^+\pi^-4\pi^0)$

¹ LEES 21C reports $[\Gamma(J/\psi(1S) \rightarrow \eta\pi^+\pi^-\pi^0) \times \Gamma(J/\psi(1S) \rightarrow e^+e^-)/\Gamma_{\text{total}}] \times [B(\eta \rightarrow 3\pi^0)] = 21.1 \pm 1.7 \pm 3.2$ eV which we divide by our best value $B(\eta \rightarrow 3\pi^0) = (32.57 \pm 0.21) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\eta\pi^+\pi^-3\pi^0) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ $\Gamma_{13}\Gamma_5/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
26.9 ± 5.7 ± 0.1	101	¹ LEES	21C	BABR $e^+e^- \rightarrow \gamma_{ISR}(\pi^+\pi^-3\pi^0\gamma\gamma)$

¹ LEES 21C reports $[\Gamma(J/\psi(1S) \rightarrow \eta\pi^+\pi^-3\pi^0) \times \Gamma(J/\psi(1S) \rightarrow e^+e^-)/\Gamma_{\text{total}}] \times [B(\eta \rightarrow 2\gamma)] = 10.6 \pm 1.6 \pm 1.6$ eV which we divide by our best value $B(\eta \rightarrow 2\gamma) = (39.36 \pm 0.18) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$$\Gamma(\eta K^\pm K_S^0 \pi^\mp) \times \Gamma(e^+ e^-) / \Gamma_{\text{total}} \quad \Gamma_{17} \Gamma_5 / \Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
7.3±1.4±0.4	44	LEES	17D BABR	$e^+ e^- \rightarrow K_S^0 K^\pm \pi^\mp \pi^0 \gamma$

$$\Gamma(\rho^\pm \pi^\mp \pi^+ \pi^- 2\pi^0) \times \Gamma(e^+ e^-) / \Gamma_{\text{total}} \quad \Gamma_{20} \Gamma_5 / \Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
155±26±36	14k	LEES	21 BABR	$10.6 e^+ e^- \rightarrow 2(\pi^+ \pi^-) 3\pi^0 \gamma$

$$\Gamma(\rho^+ \rho^- \pi^+ \pi^- \pi^0) \times \Gamma(e^+ e^-) / \Gamma_{\text{total}} \quad \Gamma_{21} \Gamma_5 / \Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
32±13±15	14k	LEES	21 BABR	$10.6 e^+ e^- \rightarrow 2(\pi^+ \pi^-) 3\pi^0 \gamma$

$$\Gamma(\rho^\mp K^\pm K_S^0) \times \Gamma(e^+ e^-) / \Gamma_{\text{total}} \quad \Gamma_{22} \Gamma_5 / \Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
10.4±1.0±1.9	130	LEES	17D BABR	$e^+ e^- \rightarrow K_S^0 K^\pm \pi^\mp \pi^0 \gamma$

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

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.

$$\Gamma(\omega \pi^0 \pi^0) \times \Gamma(e^+ e^-) / \Gamma_{\text{total}} \quad \Gamma_{36} \Gamma_5 / \Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
27.8±3.5±0.2	398	¹ LEES	18E BABR	$10.6 e^+ e^- \rightarrow \pi^+ \pi^- 3\pi^0 \gamma$

¹ LEES 18E reports $[\Gamma(J/\psi(1S) \rightarrow \omega \pi^0 \pi^0) \times \Gamma(J/\psi(1S) \rightarrow e^+ e^-) / \Gamma_{\text{total}}] \times [B(\omega(782) \rightarrow \pi^+ \pi^- \pi^0)] = 24.8 \pm 1.8 \pm 2.5$ eV which we divide by our best value $B(\omega(782) \rightarrow \pi^+ \pi^- \pi^0) = (89.2 \pm 0.7) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$$\Gamma(\omega 3\pi^0) \times \Gamma(e^+ e^-) / \Gamma_{\text{total}} \quad \Gamma_{37} \Gamma_5 / \Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
10.5±3.1±0.1	89	¹ LEES	21C BABR	$e^+ e^- \rightarrow \gamma_{ISR}(\pi^+ \pi^- 4\pi^0)$

¹ LEES 21C reports $[\Gamma(J/\psi(1S) \rightarrow \omega 3\pi^0) \times \Gamma(J/\psi(1S) \rightarrow e^+ e^-) / \Gamma_{\text{total}}] \times [B(\omega(782) \rightarrow \pi^+ \pi^- \pi^0)] = 9.4 \pm 2.3 \pm 1.5$ eV which we divide by our best value $B(\omega(782) \rightarrow \pi^+ \pi^- \pi^0) = (89.2 \pm 0.7) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$$\Gamma(\omega \pi^+ \pi^- \pi^0) \times \Gamma(e^+ e^-) / \Gamma_{\text{total}} \quad \Gamma_{40} \Gamma_5 / \Gamma$$

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

$$\Gamma(\omega\eta) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_{39}\Gamma_5/\Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
16.9±7.6±0.2		¹ LEES	21C BABR	$e^+e^- \rightarrow \gamma_{ISR}(\pi^+\pi^-4\pi^0)$

¹ Different final state as in AUBERT 06. LEES 21C reports $[\Gamma(J/\psi(1S) \rightarrow \omega\eta) \times \Gamma(J/\psi(1S) \rightarrow e^+e^-)/\Gamma_{\text{total}}] \times [B(\eta \rightarrow 3\pi^0)] \times [B(\omega(782) \rightarrow \pi^+\pi^-\pi^0)] = 4.9 \pm 2.1 \pm 0.7$ eV which we divide by our best values $B(\eta \rightarrow 3\pi^0) = (32.57 \pm 0.21) \times 10^{-2}$, $B(\omega(782) \rightarrow \pi^+\pi^-\pi^0) = (89.2 \pm 0.7) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best values.

$$\Gamma(\omega\pi^0\eta) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_{41}\Gamma_5/\Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
1.90±0.96±0.01	27	¹ LEES	18E BABR	$10.6 e^+e^- \rightarrow \pi^+\pi^-\pi^0\pi^0\eta\gamma$

¹ LEES 18E reports $[\Gamma(J/\psi(1S) \rightarrow \omega\pi^0\eta) \times \Gamma(J/\psi(1S) \rightarrow e^+e^-)/\Gamma_{\text{total}}] \times [B(\omega(782) \rightarrow \pi^+\pi^-\pi^0)] = 1.7 \pm 0.8 \pm 0.3$ eV which we divide by our best value $B(\omega(782) \rightarrow \pi^+\pi^-\pi^0) = (89.2 \pm 0.7) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$$\Gamma(\omega\pi^+\pi^-2\pi^0) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_{43}\Gamma_5/\Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
185±30±1	14k	¹ LEES	21 BABR	$10.6 e^+e^- \rightarrow 2(\pi^+\pi^-)3\pi^0\gamma$

¹ LEES 21 reports $[\Gamma(J/\psi(1S) \rightarrow \omega\pi^+\pi^-2\pi^0) \times \Gamma(J/\psi(1S) \rightarrow e^+e^-)/\Gamma_{\text{total}}] \times [B(\omega(782) \rightarrow \pi^+\pi^-\pi^0)] = 165 \pm 9 \pm 25$ eV which we divide by our best value $B(\omega(782) \rightarrow \pi^+\pi^-\pi^0) = (89.2 \pm 0.7) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$$\Gamma(\omega K\bar{K}) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_{53}\Gamma_5/\Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
3.70±1.98±0.03	24	¹ AUBERT	07AU BABR	$10.6 e^+e^- \rightarrow \omega K^+ K^- \gamma$

¹ AUBERT 07AU reports $[\Gamma(J/\psi(1S) \rightarrow \omega K\bar{K}) \times \Gamma(J/\psi(1S) \rightarrow e^+e^-)/\Gamma_{\text{total}}] \times [B(\omega(782) \rightarrow \pi^+\pi^-\pi^0)] = 3.3 \pm 1.3 \pm 1.2$ 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.

$$\Gamma(K^+ K^*(892)^- + \text{c.c.}) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_{61}\Gamma_5/\Gamma$$

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

$$\Gamma(K^+ K^*(892)^- + \text{c.c.} \rightarrow K^+ K^- \pi^0) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_{62}\Gamma_5/\Gamma$$

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

$$\Gamma(K^+ K^*(892)^- + \text{c.c.} \rightarrow K^0 K^\pm \pi^\mp + \text{c.c.}) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_{63}\Gamma_5/\Gamma$$

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

$$\Gamma(K^0 \bar{K}^*(892)^0 + \text{c.c.}) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_{64}\Gamma_5/\Gamma$$

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

$$\Gamma(K^0 \bar{K}^*(892)^0 + \text{c.c.} \rightarrow K^0 K^\pm \pi^\mp + \text{c.c.}) \times \Gamma(e^+ e^-) / \Gamma_{\text{total}} \quad \Gamma_{65} \Gamma_5 / \Gamma$$

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

$$\Gamma(\bar{K}^*(892)^0 K^+ \pi^- + \text{c.c.}) \times \Gamma(e^+ e^-) / \Gamma_{\text{total}} \quad \Gamma_{66} \Gamma_5 / \Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
$42.6 \pm 4.8 \pm 7.2$	99	¹ LEES	17D BABR	$e^+ e^- \rightarrow K_S^0 K^\pm \pi^\mp \pi^0 \gamma$

¹ Dividing by 1/6 to account for $B(K^*(892)^0 \rightarrow K_S^0 \pi^0) = 1/6$.

$$\Gamma(K^*(892)^\pm K^\mp \pi^0) \times \Gamma(e^+ e^-) / \Gamma_{\text{total}} \quad \Gamma_{67} \Gamma_5 / \Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
$22.8 \pm 2.8 \pm 6.8$	80	¹ LEES	17D BABR	$e^+ e^- \rightarrow K_S^0 K^\pm \pi^\mp \pi^0 \gamma$

¹ Dividing by 1/4 to account for $B(K^*(892)^\pm \rightarrow K_S^0 \pi^\pm) = 1/4$.

$$\Gamma(K^*(892)^+ K_S^0 \pi^- + \text{c.c.}) \times \Gamma(e^+ e^-) / \Gamma_{\text{total}} \quad \Gamma_{68} \Gamma_5 / \Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
11.0 ± 2.8 OUR AVERAGE				
$9.2 \pm 1.2 \pm 3.2$	64	¹ LEES	17D BABR	$e^+ e^- \rightarrow K_S^0 K^\pm \pi^\mp \pi^0 \gamma$
$14.8 \pm 4.8 \pm 1.2$	53	² LEES	14H BABR	$e^+ e^- \rightarrow \pi^+ \pi^- K_S^0 K_S^0 \gamma$

¹ Dividing by 1/2 to take into account $B(K^*(892)^\pm \rightarrow K^\pm \pi^\mp) = 1/2$.

² Dividing by 1/4 to take into account $B(K^*(892) \rightarrow K_S^0 \pi) = 1/4$.

$$\Gamma(K^*(892)^+ K_S^0 \pi^- + \text{c.c.} \rightarrow K_S^0 K_S^0 \pi^+ \pi^-) \times \Gamma(e^+ e^-) / \Gamma_{\text{total}} \quad \Gamma_{69} \Gamma_5 / \Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
$3.7 \pm 1.2 \pm 0.3$	53	LEES	14H BABR	$e^+ e^- \rightarrow \pi^+ \pi^- K_S^0 K_S^0 \gamma$

$$\Gamma(K^*(892)^0 K_S^0 \pi^0) \times \Gamma(e^+ e^-) / \Gamma_{\text{total}} \quad \Gamma_{71} \Gamma_5 / \Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
$3.60 \pm 0.75 \pm 2.25$	34	¹ LEES	17D BABR	$e^+ e^- \rightarrow K_S^0 K^\pm \pi^\mp \pi^0 \gamma$

¹ Dividing by 2/3 to account for $B(K^*(892)^0 \rightarrow K^+ \pi^-) = 2/3$.

$$\Gamma(K^*(892)^0 \bar{K}^*(892)^0) \times \Gamma(e^+ e^-) / \Gamma_{\text{total}} \quad \Gamma_{73} \Gamma_5 / \Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
$1.28 \pm 0.34 \pm 0.07$	47 ± 12	¹ LEES	12F BABR	$10.6 e^+ e^- \rightarrow \pi^+ \pi^- K^+ K^- \gamma$

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

$1.28 \pm 0.40 \pm 0.11$ 25 ± 8 ^{1,2} 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 $B(K^{*0} \rightarrow K^+ \pi^-) = 2/3$ $B(K^{*0} \rightarrow K \pi)$.

² Superseded by LEES 12F.

$$\Gamma(K^*(892)^\pm K^*(892)^\mp) \times \Gamma(e^+ e^-) / \Gamma_{\text{total}} \quad \Gamma_{74} \Gamma_5 / \Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
$0.80 \pm 0.48 \pm 0.32$	1 ± 5	¹ LEES	14H BABR	$e^+ e^- \rightarrow \pi^+ \pi^- K_S^0 K_S^0 \gamma$

¹ Dividing by $(1/4)^2$ to take twice into account $B(K^*(892) \rightarrow K_S^0 \pi) = 1/4$.

$$\Gamma(K_2^*(1430)^+ K_S^0 \pi^- + \text{c.c.}) \times \Gamma(e^+ e^-) / \Gamma_{\text{total}} \quad \Gamma_{84} \Gamma_5 / \Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
20.1 ± 9.8 ± 0.5	35	1,2 LEES	14H BABR	$e^+ e^- \rightarrow \pi^+ \pi^- K_S^0 K_S^0 \gamma$

¹ Dividing by 1/4 to take into account $B(K^*(1430) \rightarrow K_S^0 \pi) = 1/4 B(K^*(1430) \rightarrow K \pi)$.

² LEES 14H reports $[\Gamma(J/\psi(1S) \rightarrow K_2^*(1430)^+ K_S^0 \pi^- + \text{c.c.}) \times \Gamma(J/\psi(1S) \rightarrow e^+ e^-) / \Gamma_{\text{total}}] \times [B(K_2^*(1430) \rightarrow K \pi)] = 10.0 \pm 4.8 \pm 0.8$ eV which we divide by our best value $B(K_2^*(1430) \rightarrow K \pi) = (49.9 \pm 1.2) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$$\Gamma(\bar{K}_2^*(1430)^0 K^*(892)^0 + \text{c.c.}) \times \Gamma(e^+ e^-) / \Gamma_{\text{total}} \quad \Gamma_{85} \Gamma_5 / \Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
25.8 ± 1.4 ± 0.6	710	1,2,3 LEES	12F BABR	$10.6 e^+ e^- \rightarrow \pi^+ \pi^- K^+ K^- \gamma$

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

33 ± 4 ± 1	317	2,4 AUBERT	07AK BABR	$10.6 e^+ e^- \rightarrow \pi^+ \pi^- K^+ K^- \gamma$
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¹ LEES 12F reports $[\Gamma(J/\psi(1S) \rightarrow \bar{K}_2^*(1430)^0 K^*(892)^0 + \text{c.c.}) \times \Gamma(J/\psi(1S) \rightarrow e^+ e^-) / \Gamma_{\text{total}}] \times [B(K_2^*(1430) \rightarrow K \pi)] = 12.89 \pm 0.54 \pm 0.41$ eV which we divide by our best value $B(K_2^*(1430) \rightarrow K \pi) = (49.9 \pm 1.2) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

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

³ The $K_2^*(1430)$ cannot be distinguished from the $K_0^*(1430)$.

⁴ Superseded by LEES 12F. AUBERT 07AK reports $[\Gamma(J/\psi(1S) \rightarrow \bar{K}_2^*(1430)^0 K^*(892)^0 + \text{c.c.}) \times \Gamma(J/\psi(1S) \rightarrow e^+ e^-) / \Gamma_{\text{total}}] \times [B(K_2^*(1430) \rightarrow K \pi)] = 16.4 \pm 1.1 \pm 1.4$ eV which we divide by our best value $B(K_2^*(1430) \rightarrow K \pi) = (49.9 \pm 1.2) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$$\Gamma(K_2^*(1430)^- K^*(892)^+ + \text{c.c.}) \times \Gamma(e^+ e^-) / \Gamma_{\text{total}} \quad \Gamma_{86} \Gamma_5 / \Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
18.6 ± 16.1 ± 0.4	8 ± 8	1,2 LEES	14H BABR	$e^+ e^- \rightarrow \pi^+ \pi^- K_S^0 K_S^0 \gamma$

¹ Dividing by $(1/4)^2$ to take into account $B(K^*(892) \rightarrow K_S^0 \pi) = 1/4$ and $B(K^*(1430) \rightarrow K_S^0 \pi) = 1/4 B(K^*(1430) \rightarrow K \pi)$.

² LEES 14H reports $[\Gamma(J/\psi(1S) \rightarrow K_2^*(1430)^- K^*(892)^+ + \text{c.c.}) \times \Gamma(J/\psi(1S) \rightarrow e^+ e^-) / \Gamma_{\text{total}}] \times [B(K_2^*(1430) \rightarrow K \pi)] = 9.28 \pm 8.0 \pm 0.32$ eV which we divide by our best value $B(K_2^*(1430) \rightarrow K \pi) = (49.9 \pm 1.2) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$$\Gamma(K_2^*(1430)^- K^*(892)^+ + \text{c.c.} \rightarrow K^*(892)^+ K_S^0 \pi^- + \text{c.c.}) \times \Gamma(e^+ e^-) / \Gamma_{\text{total}} \quad \Gamma_{87} \Gamma_5 / \Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
2.32 ± 2.00 ± 0.08	8 ± 8	¹ LEES	14H BABR	$e^+ e^- \rightarrow \pi^+ \pi^- K_S^0 K_S^0 \gamma$

¹ Dividing by 1/4 to take into account $B(K^*(892) \rightarrow K_S^0 \pi) = 1/4$.

$$\frac{\Gamma(\overline{K}_2(1770)^0 K^*(892)^0 + \text{c.c.} \rightarrow K^*(892)^0 K^- \pi^+ + \text{c.c.}) \times \Gamma(e^+ e^-)}{\Gamma_{\text{total}} \Gamma_{89} \Gamma_5 / \Gamma}$$

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.

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

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
4.48±0.35 OUR AVERAGE				
4.46±0.49±0.05	181	¹ LEES	12F BABR	10.6 e ⁺ e ⁻ → K ⁺ K ⁻ π ⁺ π ⁻ γ
4.51±0.48±0.05	254 ± 23	² SHEN	09 BELL	10.6 e ⁺ e ⁻ → K ⁺ K ⁻ π ⁺ π ⁻ γ

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

5.3 ± 0.7 ± 0.1	103	³ AUBERT, BE 06D	BABR	10.6 e ⁺ e ⁻ → K ⁺ K ⁻ π ⁺ π ⁻ γ
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¹ LEES 12F reports $[\Gamma(J/\psi(1S) \rightarrow \phi \pi^+ \pi^-) \times \Gamma(J/\psi(1S) \rightarrow e^+ e^-)] / \Gamma_{\text{total}}$ × [B(φ(1020) → K⁺K⁻)] = 2.19 ± 0.23 ± 0.07 eV which we divide by our best value B(φ(1020) → K⁺K⁻) = (49.1 ± 0.5) × 10⁻². Our first error is their experiment's error and our second error is the systematic error from using our best value.

² SHEN 09 reports 4.50 ± 0.41 ± 0.26 eV from a measurement of $[\Gamma(J/\psi(1S) \rightarrow \phi \pi^+ \pi^-) \times \Gamma(J/\psi(1S) \rightarrow e^+ e^-)] / \Gamma_{\text{total}}$ × [B(φ(1020) → K⁺K⁻)] assuming B(φ(1020) → K⁺K⁻) = (49.2 ± 0.6) × 10⁻², which we rescale to our best value B(φ(1020) → K⁺K⁻) = (49.1 ± 0.5) × 10⁻². Our first error is their experiment's error and our second error is the systematic error from using our best value.

³ Superseded by LEES 12F. AUBERT, BE 06D reports $[\Gamma(J/\psi(1S) \rightarrow \phi \pi^+ \pi^-) \times \Gamma(J/\psi(1S) \rightarrow e^+ e^-)] / \Gamma_{\text{total}}$ × [B(φ(1020) → K⁺K⁻)] = 2.61 ± 0.30 ± 0.18 eV which we divide by our best value B(φ(1020) → K⁺K⁻) = (49.1 ± 0.5) × 10⁻². Our first error is their experiment's error and our second error is the systematic error from using our best value.

$$\frac{\Gamma(\phi \pi^0 \pi^0) \times \Gamma(e^+ e^-)}{\Gamma_{\text{total}} \Gamma_{97} \Gamma_5 / \Gamma}$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
2.77±0.57±0.03	45	¹ LEES	12F BABR	10.6 e ⁺ e ⁻ → K ⁺ K ⁻ π ⁰ π ⁰ γ

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

3.13±0.88±0.03	23	² AUBERT, BE 06D	BABR	10.6 e ⁺ e ⁻ → K ⁺ K ⁻ π ⁰ π ⁰ γ
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¹ LEES 12F reports $[\Gamma(J/\psi(1S) \rightarrow \phi \pi^0 \pi^0) \times \Gamma(J/\psi(1S) \rightarrow e^+ e^-)] / \Gamma_{\text{total}}$ × [B(φ(1020) → K⁺K⁻)] = 1.36 ± 0.27 ± 0.07 eV which we divide by our best value B(φ(1020) → K⁺K⁻) = (49.1 ± 0.5) × 10⁻². Our first error is their experiment's error and our second error is the systematic error from using our best value.

² Superseded by LEES 12F. AUBERT, BE 06D reports $[\Gamma(J/\psi(1S) \rightarrow \phi \pi^0 \pi^0) \times \Gamma(J/\psi(1S) \rightarrow e^+ e^-)] / \Gamma_{\text{total}}$ × [B(φ(1020) → K⁺K⁻)] = 1.54 ± 0.40 ± 0.16 eV which we divide by our best value B(φ(1020) → K⁺K⁻) = (49.1 ± 0.5) × 10⁻². Our first error is their experiment's error and our second error is the systematic error from using our best value.

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

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 $B(\phi(1020) \rightarrow K^+ K^-) = (49.1 \pm 0.5) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

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

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.

$$\Gamma(\phi f_0(980) \rightarrow \phi \pi^+ \pi^-) \times \Gamma(e^+ e^-) / \Gamma_{\text{total}} \quad \Gamma_{103} \Gamma_5 / \Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
1.44 ± 0.19 OUR AVERAGE				

1.40 ± 0.25 ± 0.02 57 ± 9 ¹ LEES 12F BABR 10.6 $e^+ e^- \rightarrow \pi^+ \pi^- K^+ K^- \gamma$

1.48 ± 0.27 ± 0.09 60 ± 11 ² SHEN 09 BELL 10.6 $e^+ e^- \rightarrow K^+ K^- \pi^+ \pi^- \gamma$

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

1.02 ± 0.24 ± 0.01 20 ± 5 ³ AUBERT 07AK BABR 10.6 $e^+ e^- \rightarrow \pi^+ \pi^- K^+ K^- \gamma$

¹ LEES 12F reports $[\Gamma(J/\psi(1S) \rightarrow \phi f_0(980) \rightarrow \phi \pi^+ \pi^-) \times \Gamma(J/\psi(1S) \rightarrow e^+ e^-) / \Gamma_{\text{total}}] \times [B(\phi(1020) \rightarrow K^+ K^-)] = 0.69 \pm 0.11 \pm 0.05$ eV which we divide by our best value $B(\phi(1020) \rightarrow K^+ K^-) = (49.1 \pm 0.5) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

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

³ Superseded by LEES 12F. 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 $B(\phi(1020) \rightarrow K^+ K^-) = (49.1 \pm 0.5) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$$\Gamma(\phi f_0(980) \rightarrow \phi \pi^0 \pi^0) \times \Gamma(e^+ e^-) / \Gamma_{\text{total}} \quad \Gamma_{104} \Gamma_5 / \Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
0.98 ± 0.26 ± 0.01	16 ± 4	¹ LEES	12F BABR	10.6 $e^+ e^- \rightarrow \pi^0 \pi^0 K^+ K^- \gamma$

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

0.96 ± 0.40 ± 0.01 7.0 ± 2.8 ² AUBERT 07AK BABR 10.6 $e^+ e^- \rightarrow \pi^0 \pi^0 K^+ K^- \gamma$

¹ LEES 12F reports $[\Gamma(J/\psi(1S) \rightarrow \phi f_0(980) \rightarrow \phi \pi^0 \pi^0) \times \Gamma(J/\psi(1S) \rightarrow e^+ e^-) / \Gamma_{\text{total}}] \times [B(\phi(1020) \rightarrow K^+ K^-)] = 0.48 \pm 0.12 \pm 0.05$ eV which we divide by our best value $B(\phi(1020) \rightarrow K^+ K^-) = (49.1 \pm 0.5) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

² Superseded by LEES 12F. AUBERT 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 $B(\phi(1020) \rightarrow K^+ K^-) = (49.1 \pm 0.5) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$$\Gamma(\phi f_2(1270)) \times \Gamma(e^+ e^-) / \Gamma_{\text{total}} \quad \Gamma_{109} \Gamma_5 / \Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
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$1.79 \pm 0.32^{+0.02}_{-0.06}$	61	1,2,3 LEES	12F BABR	$10.6 e^+ e^- \rightarrow \pi^+ \pi^- K^+ K^- \gamma$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

$4.08 \pm 0.73^{+0.04}_{-0.14}$	44	2,4 AUBERT	07AK BABR	$10.6 e^+ e^- \rightarrow \pi^+ \pi^- K^+ K^- \gamma$
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¹ LEES 12F reports $[\Gamma(J/\psi(1S) \rightarrow \phi f_2(1270)) \times \Gamma(J/\psi(1S) \rightarrow e^+ e^-) / \Gamma_{\text{total}}] \times [B(f_2(1270) \rightarrow \pi\pi)] = 1.51 \pm 0.25 \pm 0.10$ 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.

² Using $B(\phi \rightarrow K^+ K^-) = (48.9 \pm 0.5)\%$.

³ Using $\pi^+ \pi^-$ invariant mass between 1.1 and 1.5 GeV. May include other sources such as $f_0(1370)$.

⁴ Superseded by LEES 12F. AUBERT 07AK reports $[\Gamma(J/\psi(1S) \rightarrow \phi f_2(1270)) \times \Gamma(J/\psi(1S) \rightarrow e^+ e^-) / \Gamma_{\text{total}}] \times [B(f_2(1270) \rightarrow \pi\pi)] = 3.44 \pm 0.55 \pm 0.28$ 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.

$$\Gamma(\phi f'_2(1525)) \times \Gamma(e^+ e^-) / \Gamma_{\text{total}} \quad \Gamma_{114} \Gamma_5 / \Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
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$8.2 \pm 3.2 \pm 0.2$	11	1,2 LEES	14H BABR	$e^+ e^- \rightarrow K_S^0 K_S^0 K^+ K^- \gamma$
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¹ Dividing by 1/4 to take into account $B(f'_2(1525) \rightarrow K_S^0 K_S^0) = 1/4 B(f'_2(1525) \rightarrow K \bar{K})$ and using $B(\phi \rightarrow K^+ K^-) = (48.9 \pm 0.5)\%$.

² LEES 14H reports $[\Gamma(J/\psi(1S) \rightarrow \phi f'_2(1525)) \times \Gamma(J/\psi(1S) \rightarrow e^+ e^-) / \Gamma_{\text{total}}] \times [B(f'_2(1525) \rightarrow K \bar{K})] = 7.2 \pm 2.8 \pm 0.3$ eV which we divide by our best value $B(f'_2(1525) \rightarrow K \bar{K}) = (87.6 \pm 2.2) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$$\Gamma(\phi K^+ K^-) \times \Gamma(e^+ e^-) / \Gamma_{\text{total}} \quad \Gamma_{120} \Gamma_5 / \Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
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$4.60 \pm 0.62 \pm 0.05$	163	¹ LEES	12F BABR	$10.6 e^+ e^- \rightarrow K^+ K^- K^+ K^- \gamma$
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¹ LEES 12F reports $[\Gamma(J/\psi(1S) \rightarrow \phi K^+ K^-) \times \Gamma(J/\psi(1S) \rightarrow e^+ e^-) / \Gamma_{\text{total}}] \times [B(\phi(1020) \rightarrow K^+ K^-)] = 2.26 \pm 0.26 \pm 0.16$ eV which we divide by our best value $B(\phi(1020) \rightarrow K^+ K^-) = (49.1 \pm 0.5) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$$\Gamma(\phi K_S^0 K_S^0) \times \Gamma(e^+ e^-) / \Gamma_{\text{total}} \quad \Gamma_{121} \Gamma_5 / \Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
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$3.26 \pm 0.84 \pm 0.04$	29	¹ LEES	14H BABR	$e^+ e^- \rightarrow K_S^0 K_S^0 K^+ K^- \gamma$
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¹ LEES 14H reports $[\Gamma(J/\psi(1S) \rightarrow \phi K_S^0 K_S^0) \times \Gamma(J/\psi(1S) \rightarrow e^+ e^-) / \Gamma_{\text{total}}] \times [B(\phi(1020) \rightarrow K^+ K^-)] = 1.6 \pm 0.4 \pm 0.1$ eV which we divide by our best value $B(\phi(1020) \rightarrow K^+ K^-) = (49.1 \pm 0.5) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$$\Gamma(f'_2(1525)K^+K^-) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_{126}\Gamma_5/\Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
5.8±1.9±0.1	16	1,2 LEES	14H BABR	$e^+e^- \rightarrow K_S^0 K_S^0 K^+K^- \gamma$

¹ Dividing by 1/4 to take into account $B(f'_2(1525) \rightarrow K_S^0 K_S^0) = 1/4 B(f'_2(1525) \rightarrow K\bar{K})$.

² LEES 14H reports $[\Gamma(J/\psi(1S) \rightarrow f'_2(1525)K^+K^-) \times \Gamma(J/\psi(1S) \rightarrow e^+e^-)/\Gamma_{\text{total}}] \times [B(f'_2(1525) \rightarrow K\bar{K})] = 5.12 \pm 1.68 \pm 0.20$ eV which we divide by our best value $B(f'_2(1525) \rightarrow K\bar{K}) = (87.6 \pm 2.2) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$$\Gamma(2(\pi^+\pi^-\pi^0) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_{145}\Gamma_5/\Gamma$$

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

$$\Gamma(\pi^+\pi^-\pi^0) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_{147}\Gamma_5/\Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
104 ±50 OUR AVERAGE		Error includes scale factor of 4.3.		

55.4±15.9±0.5	14k	¹ LEES	21 BABR	$10.6 e^+e^- \rightarrow 2(\pi^+\pi^-\pi^0)\gamma$
150.0±4.0±15.0	2.3k	LEES	18E BABR	$10.6 e^+e^- \rightarrow \pi^+\pi^-\pi^0\gamma$

¹ LEES 21 reports $[\Gamma(J/\psi(1S) \rightarrow \pi^+\pi^-\pi^0) \times \Gamma(J/\psi(1S) \rightarrow e^+e^-)/\Gamma_{\text{total}}] \times [\Gamma(\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-)/\Gamma_{\text{total}}] = 19.2 \pm 4.5 \pm 3.2$ eV which we divide by our best value $\Gamma(\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-)/\Gamma_{\text{total}} = 0.3468 \pm 0.0030$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$$\Gamma(\pi^+\pi^-\pi^0) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_{148}\Gamma_5/\Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
35.8±4.4±5.4	340	LEES	21C BABR	$e^+e^- \rightarrow \gamma_{ISR}(\pi^+\pi^-\pi^0)$

$$\Gamma(\rho^\pm\pi^\mp\pi^0\pi^0) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_{149}\Gamma_5/\Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
78.0±9.0±8.0	1.2k	LEES	18E BABR	$10.6 e^+e^- \rightarrow \pi^+\pi^-\pi^0\gamma$

$$\Gamma(\rho^+\rho^-\pi^0) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_{150}\Gamma_5/\Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
33.0±5.0±3.3	529	LEES	18E BABR	$10.6 e^+e^- \rightarrow \pi^+\pi^-\pi^0\gamma$

$$\Gamma(\pi^+\pi^-\pi^0) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_{151}\Gamma_5/\Gamma$$

VALUE (keV)	DOCUMENT ID	TECN	COMMENT
0.1248±0.0019±0.0026	LEES	21B BABR	$10.5 e^+e^- \rightarrow \pi^+\pi^-\pi^0\gamma$

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

0.122 ±0.005 ±0.008	AUBERT,B	04N BABR	$10.6 e^+e^- \rightarrow \pi^+\pi^-\pi^0\gamma$
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$$\Gamma(2(\pi^+\pi^-\pi^0)) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_{152}\Gamma_5/\Gamma$$

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

$$\Gamma(\pi^+\pi^-\pi^0K^+K^-) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_{153}\Gamma_5/\Gamma$$

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

$$\Gamma(2(\pi^+\pi^-)) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_{155}\Gamma_5/\Gamma$$

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.

$$\Gamma(3(\pi^+\pi^-)) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_{156}\Gamma_5/\Gamma$$

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

$$\Gamma(2(\pi^+\pi^-)3\pi^0) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_{157}\Gamma_5/\Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
345±10±50	14k	LEES	21 BABR	10.6 e ⁺ e ⁻ → 2(π ⁺ π ⁻)3π ⁰ γ

$$\Gamma(2(\pi^+\pi^-\eta)) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_{159}\Gamma_5/\Gamma$$

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 [Γ(J/ψ(1S) → 2(π⁺π⁻)η) × Γ(J/ψ(1S) → e⁺e⁻)/Γ_{total}] × [B(η → 2γ)] = 5.16 ± 0.85 ± 0.39 eV which we divide by our best value B(η → 2γ) = (39.36 ± 0.18) × 10⁻². Our first error is their experiment's error and our second error is the systematic error from using our best value.

$$\Gamma(2(\pi^+\pi^-\pi^0)\eta) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_{161}\Gamma_5/\Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
9.1±2.6±1.4	14k	LEES	21 BABR	10.6 e ⁺ e ⁻ → 2(π ⁺ π ⁻)3π ⁰ γ

$$\Gamma(\pi^+\pi^-\pi^0\pi^0\eta) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_{162}\Gamma_5/\Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
13.1± 2.7 OUR AVERAGE				

26.1±17.9±0.3	14k	¹ LEES	21 BABR	10.6 e ⁺ e ⁻ → 2(π ⁺ π ⁻)3π ⁰ γ
12.8± 1.8±2.0	203	LEES	18E BABR	10.6 e ⁺ e ⁻ → π ⁺ π ⁻ π ⁰ π ⁰ ηγ

¹LEES 21 reports [Γ(J/ψ(1S) → π⁺π⁻π⁰π⁰η) × Γ(J/ψ(1S) → e⁺e⁻)/Γ_{total}] × [B(η → π⁺π⁻π⁰)] = 6 ± 4 ± 1 eV which we divide by our best value B(η → π⁺π⁻π⁰) = (23.02 ± 0.25) × 10⁻². Our first error is their experiment's error and our second error is the systematic error from using our best value.

$$\Gamma(\rho^\pm\pi^\mp\pi^0\eta) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_{163}\Gamma_5/\Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
10.5±4.1±1.6	168	LEES	18E BABR	10.6 e ⁺ e ⁻ → π ⁺ π ⁻ π ⁰ π ⁰ ηγ

$\Gamma(K^+K^-) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ $\Gamma_{164}\Gamma_5/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
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• • • We do not use the following data for averages, fits, limits, etc. • • •

$1.78 \pm 0.11 \pm 0.05$	462	¹ LEES	15J BABR	$e^+e^- \rightarrow K^+K^-\gamma$
$1.94 \pm 0.11 \pm 0.05$	462	² LEES	15J BABR	$e^+e^- \rightarrow K^+K^-\gamma$
$1.42 \pm 0.23 \pm 0.08$	51	³ LEES	13Q BABR	$e^+e^- \rightarrow K^+K^-\gamma$

¹ $\sin\phi > 0$.² $\sin\phi < 0$.³ Interference with non-resonant K^+K^- production not taken into account. $\Gamma(K_S^0 K_L^0 \pi^0) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ $\Gamma_{170}\Gamma_5/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
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$11.4 \pm 1.3 \pm 0.6$	182	LEES	17A BABR	$e^+e^- \rightarrow K_S^0 K_L^0 \pi^0 \gamma$
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 $\Gamma(K^*(892)^0 \bar{K}^0 + \text{c.c.} \rightarrow K_S^0 K_L^0 \pi^0) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ $\Gamma_{171}\Gamma_5/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
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$6.7 \pm 0.9 \pm 0.4$	106	LEES	17A BABR	$e^+e^- \rightarrow K_S^0 K_L^0 \pi^0 \gamma$
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 $\Gamma(K_2^*(1430)^0 \bar{K}^0 + \text{c.c.} \rightarrow K_S^0 K_L^0 \pi^0) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ $\Gamma_{172}\Gamma_5/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
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$2.4 \pm 0.7 \pm 0.1$	37	LEES	17A BABR	$e^+e^- \rightarrow K_S^0 K_L^0 \pi^0 \gamma$
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 $\Gamma(K^+K^-\pi^+\pi^-) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ $\Gamma_{173}\Gamma_5/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
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$37.94 \pm 0.81 \pm 1.10$	3.1k	LEES	12F BABR	$10.6 e^+e^- \rightarrow \pi^+\pi^- K^+K^-\gamma$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

$36.3 \pm 1.3 \pm 2.1$	1.5k	¹ AUBERT	07AK BABR	$10.6 e^+e^- \rightarrow \pi^+\pi^- K^+K^-\gamma$
$33.6 \pm 2.7 \pm 2.7$	233	² AUBERT	05D BABR	$10.6 e^+e^- \rightarrow K^+K^-\pi^+\pi^-\gamma$

¹ Superseded by LEES 12F.² Superseded by AUBERT 07AK. $\Gamma(K^+K^-\pi^0\pi^0) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ $\Gamma_{174}\Gamma_5/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
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$11.75 \pm 0.81 \pm 0.90$	388	LEES	12F BABR	$10.6 e^+e^- \rightarrow \pi^0\pi^0 K^+K^-\gamma$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

$13.6 \pm 1.1 \pm 1.3$	203	¹ AUBERT	07AK BABR	$10.6 e^+e^- \rightarrow \pi^0\pi^0 K^+K^-\gamma$
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¹ Superseded by LEES 12F. $\Gamma(K_S^0 K_L^0 \pi^+\pi^-) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ $\Gamma_{175}\Gamma_5/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
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$20.8 \pm 2.3 \pm 2.1$	248	LEES	14H BABR	$e^+e^- \rightarrow \pi^+\pi^- K_S^0 K_L^0 \gamma$
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 $\Gamma(K_S^0 K_L^0 \pi^0\pi^0) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ $\Gamma_{176}\Gamma_5/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
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$10.3 \pm 2.3 \pm 0.5$	47	LEES	17A BABR	$e^+e^- \rightarrow K_S^0 K_L^0 \pi^0\pi^0 \gamma$
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$$\Gamma(K_S^0 K_L^0 \eta) \times \Gamma(e^+ e^-) / \Gamma_{\text{total}} \quad \Gamma_{177} \Gamma_5 / \Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
8.0±1.8±0.4	45	LEES	17A	BABR $e^+ e^- \rightarrow K_S^0 K_L^0 \eta \gamma$

$$\Gamma(K_S^0 K_S^0 \pi^+ \pi^-) \times \Gamma(e^+ e^-) / \Gamma_{\text{total}} \quad \Gamma_{178} \Gamma_5 / \Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
9.3±0.9±0.5	133	LEES	14H	BABR $e^+ e^- \rightarrow \pi^+ \pi^- K_S^0 K_S^0 \gamma$

$$\Gamma(K^\mp K_S^0 \pi^\pm \pi^0) \times \Gamma(e^+ e^-) / \Gamma_{\text{total}} \quad \Gamma_{179} \Gamma_5 / \Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
31.7±1.9±1.8	393	LEES	17D	BABR $e^+ e^- \rightarrow K_S^0 K^\pm \pi^\mp \pi^0 \gamma$

$$\Gamma(K^+ K^- 2(\pi^+ \pi^-)) \times \Gamma(e^+ e^-) / \Gamma_{\text{total}} \quad \Gamma_{180} \Gamma_5 / \Gamma$$

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

$$\Gamma(K^+ K^- \pi^+ \pi^- \eta) \times \Gamma(e^+ e^-) / \Gamma_{\text{total}} \quad \Gamma_{181} \Gamma_5 / \Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
25.9±3.9±0.1	73	¹ AUBERT	07AU	BABR $10.6 e^+ e^- \rightarrow K^+ K^- \pi^+ \pi^- \eta \gamma$

¹ AUBERT 07AU reports $[\Gamma(J/\psi(1S) \rightarrow K^+ K^- \pi^+ \pi^- \eta) \times \Gamma(J/\psi(1S) \rightarrow e^+ e^-) / \Gamma_{\text{total}}] \times [B(\eta \rightarrow 2\gamma)] = 10.2 \pm 1.3 \pm 0.8$ eV which we divide by our best value $B(\eta \rightarrow 2\gamma) = (39.36 \pm 0.18) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$$\Gamma(2(K^+ K^-)) \times \Gamma(e^+ e^-) / \Gamma_{\text{total}} \quad \Gamma_{182} \Gamma_5 / \Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
4.00±0.33±0.29	287 ± 24	LEES	12F	BABR $10.6 e^+ e^- \rightarrow 2(K^+ K^-) \gamma$

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

4.11±0.39±0.30	156 ± 15	¹ AUBERT	07AK	BABR $10.6 e^+ e^- \rightarrow 2(K^+ K^-) \gamma$
4.0 ± 0.7 ± 0.6	38	² AUBERT	05D	BABR $10.6 e^+ e^- \rightarrow 2(K^+ K^-) \gamma$

¹ Superseded by LEES 12F.

² Superseded by AUBERT 07AK.

$$\Gamma(K^+ K^- K_S^0 K_S^0) \times \Gamma(e^+ e^-) / \Gamma_{\text{total}} \quad \Gamma_{183} \Gamma_5 / \Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
2.3±0.4±0.1	29	LEES	14H	BABR $e^+ e^- \rightarrow K_S^0 K_S^0 K^+ K^- \gamma$

$$\Gamma(p\bar{p}) \times \Gamma(e^+ e^-) / \Gamma_{\text{total}} \quad \Gamma_{184} \Gamma_5 / \Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
11.9±0.6 OUR AVERAGE	Error includes scale factor of 1.8. See the ideogram below.			

11.3±0.4±0.3 821 ¹ LEES 130 BABR $e^+ e^- \rightarrow p\bar{p} \gamma$

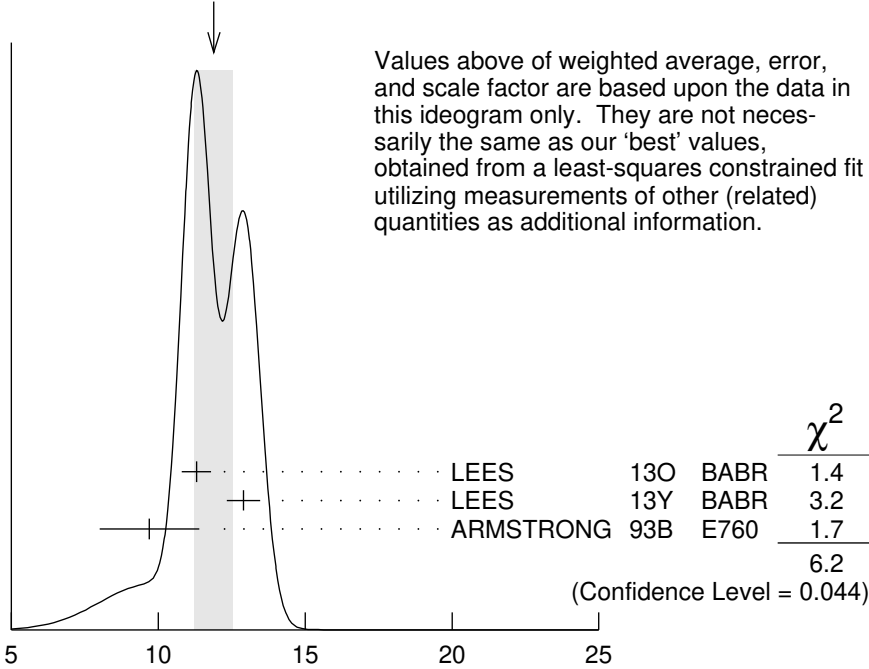
12.9±0.4±0.4 918 ² LEES 13Y BABR $e^+ e^- \rightarrow p\bar{p} \gamma$

9.7±1.7 ³ ARMSTRONG 93B E760 $\bar{p}p \rightarrow e^+ e^-$

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

12.0±0.6±0.5 438 ⁴ AUBERT 06B BABR $e^+ e^- \rightarrow p\bar{p} \gamma$

WEIGHTED AVERAGE
 11.9 ± 0.6 (Error scaled by 1.8)



- ¹ ISR photon reconstructed in the detector
 - ² ISR photon undetected
 - ³ Using $\Gamma_{\text{total}} = 85.5^{+6.1}_{-5.8}$ MeV.
 - ⁴ Superseded by LEES 130
- $\Gamma(p\bar{p}) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ (eV)

$\Gamma(\Lambda\bar{\Lambda}) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$	DOCUMENT ID	TECN	COMMENT	$\Gamma_{200}\Gamma_5/\Gamma$
$10.7 \pm 0.9 \pm 0.7$	AUBERT	07BD	BABR	$10.6 e^+e^- \rightarrow \Lambda\bar{\Lambda}\gamma$

$\Gamma(\Sigma^0\bar{\Sigma}^0) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$	DOCUMENT ID	TECN	COMMENT	$\Gamma_{210}\Gamma_5/\Gamma$
$6.4 \pm 1.2 \pm 0.6$	AUBERT	07BD	BABR	$10.6 e^+e^- \rightarrow \Sigma^0\bar{\Sigma}^0\gamma$

J/ψ(1S) BRANCHING RATIOS

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

$\Gamma(\text{hadrons})/\Gamma_{\text{total}}$	DOCUMENT ID	TECN	COMMENT	Γ_1/Γ
0.877 ± 0.005 OUR AVERAGE				
0.878 ± 0.005	BAI	95B	BES	e^+e^-
0.86 ± 0.02	BOYARSKI	75	MRK1	e^+e^-

$\Gamma(\text{virtual}\gamma \rightarrow \text{hadrons})/\Gamma_{\text{total}}$	DOCUMENT ID	TECN	COMMENT	Γ_2/Γ
0.135 ± 0.003	^{1,2} SETH	04	RVUE	e^+e^-

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

0.17 ± 0.02 ¹ BOYARSKI 75 MRK1 e^+e^-

¹ Included in $\Gamma(\text{hadrons})/\Gamma_{\text{total}}$.

² Using $B(J/\psi \rightarrow \ell^+ \ell^-) = (5.90 \pm 0.09)\%$ from RPP-2002 and $R = 2.28 \pm 0.04$ determined by a fit to data from BAI 00 and BAI 02C.

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

<u>VALUE (units 10^{-2})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
64.1 ± 1.0	6 M	¹ BESSON	08 CLEO	$\psi(2S) \rightarrow \pi^+ \pi^- + \text{hadrons}$

¹ Calculated using the value $\Gamma(\gamma g g)/\Gamma(g g g) = 0.137 \pm 0.001 \pm 0.016 \pm 0.004$ from BESSON 08 and the PDG 08 values of $B(\ell^+ \ell^-)$, $B(\text{virtual } \gamma \rightarrow \text{hadrons})$, and $B(\gamma \eta_C)$. The statistical error is negligible and the systematic error is partially correlated with that of $\Gamma(\gamma g g)/\Gamma_{\text{total}}$ measurement of BESSON 08.

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

<u>VALUE (units 10^{-2})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
8.79 ± 1.05	200 k	¹ BESSON	08 CLEO	$\psi(2S) \rightarrow \pi^+ \pi^- \gamma + \text{hadrons}$

¹ Calculated using the value $\Gamma(\gamma g g)/\Gamma(g g g) = 0.137 \pm 0.001 \pm 0.016 \pm 0.004$ from BESSON 08 and the value of $\Gamma(g g g)/\Gamma_{\text{total}}$. The statistical error is negligible and the systematic error is partially correlated with that of $\Gamma(g g g)/\Gamma_{\text{total}}$ 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	BESSON	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

VALUE	DOCUMENT ID	TECN	COMMENT
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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
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1.69 ±0.15 OUR AVERAGE Error includes scale factor of 2.4. See the ideogram below.

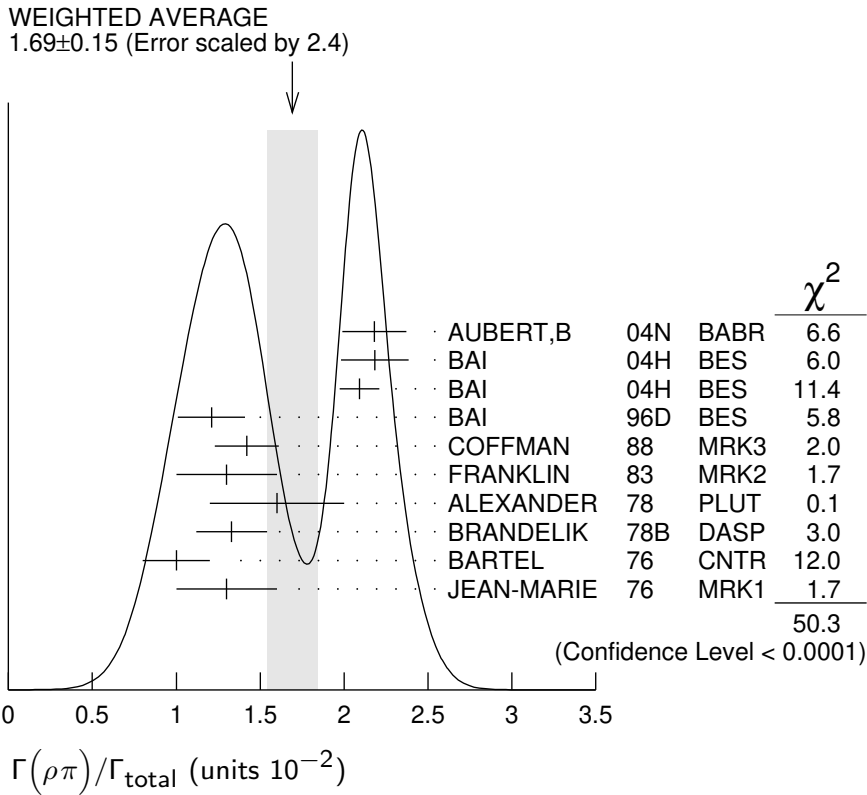
2.18 ±0.19		^{1,2} AUBERT,B	04N	BABR	10.6 $e^+e^- \rightarrow \pi^+\pi^-\pi^0\gamma$
2.184±0.005±0.201	220k	^{2,3} BAI	04H	BES	$e^+e^- \rightarrow J/\psi \rightarrow \pi^+\pi^-\pi^0$
2.091±0.021±0.116		^{2,4} BAI	04H	BES	$\psi(2S) \rightarrow \pi^+\pi^- J/\psi$
1.21 ±0.20		BAI	96D	BES	$e^+e^- \rightarrow \rho\pi$
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 $B(J/\psi \rightarrow \mu^+\mu^-) = 5.88 \pm 0.10\%$.



$\Gamma(\rho\pi)/\Gamma(\pi^+\pi^-\pi^0)$ Γ_8/Γ_{151}

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
$1.142 \pm 0.011 \pm 0.026$	20k	¹ LEES	17C BABR	$J/\psi \rightarrow \pi^+\pi^-\pi^0$

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

1.331 ± 0.033	20k	² LEES	17C BABR	$J/\psi \rightarrow \pi^+\pi^-\pi^0$
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¹ From a Dalitz plot analysis in an isobar model.

² From a Dalitz plot analysis in a Veneziano model.

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

VALUE	DOCUMENT ID	TECN	COMMENT
$0.328 \pm 0.005 \pm 0.027$	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^-

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

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

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

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
3.78±0.68	471	¹ ABLIKIM	19Q BES3	$e^+e^- \rightarrow J/\psi \rightarrow \eta\pi^+\pi^-$

¹From an energy scan of $e^+e^- \rightarrow J/\psi \rightarrow \eta\pi^+\pi^-$ assuming PDG 16 values for $\Gamma(e^+e^-)$, $\Gamma(\mu^+\mu^-)$, and $\Gamma(\text{total})$.

 $\Gamma(\eta\rho)/\Gamma_{\text{total}}$ Γ_{14}/Γ

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

 $\Gamma(\eta\phi(2170) \rightarrow \eta\phi f_0(980) \rightarrow \eta\phi\pi^+\pi^-)/\Gamma_{\text{total}}$ Γ_{15}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
1.20±0.14±0.37	471	ABLIKIM	15H BES3	$e^+e^- \rightarrow J/\psi \rightarrow \phi\eta\pi^+\pi^-$

 $\Gamma(\eta\phi(2170) \rightarrow \eta K^*(892)^0 \bar{K}^*(892)^0)/\Gamma_{\text{total}}$ Γ_{16}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<2.52 × 10⁻⁴	90	ABLIKIM	10C BES2	$J/\psi \rightarrow \eta K^+\pi^- K^- \pi^+$

 $\Gamma(\eta K^\pm K_S^0 \pi^\mp)/\Gamma_{\text{total}}$ Γ_{17}/Γ

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

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

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

 $\Gamma(\rho\eta'(958))/\Gamma_{\text{total}}$ Γ_{19}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT
8.1 ± 0.8 OUR AVERAGE				Error includes scale factor of 1.6.
7.90±0.19±0.49	3476	¹ ABLIKIM	17AK BES3	$J/\psi \rightarrow \pi^+\pi^-\eta'$
8.3 ± 3.0 ± 1.2	19	JOUSSET	90 DM2	$J/\psi \rightarrow \text{hadrons}$
11.4 ± 1.4 ± 1.6		COFFMAN	88 MRK3	$J/\psi \rightarrow \pi^+\pi^-\eta'$

¹From a partial wave analysis of the decay $J/\psi \rightarrow \pi^+\pi^-\eta'$.

 $\Gamma(\rho(1450)\pi \rightarrow \pi^+\pi^-\pi^0)/\Gamma(\pi^+\pi^-\pi^0)$ Γ_{24}/Γ_{151}

VALUE (%)	EVTS	DOCUMENT ID	TECN	COMMENT
10.9 ± 1.7 ± 2.7	20k	¹ LEES	17C BABR	$J/\psi \rightarrow \pi^+\pi^-\pi^0$
• • •				We do not use the following data for averages, fits, limits, etc. • • •
0.80±0.27	20k	² LEES	17C BABR	$J/\psi \rightarrow \pi^+\pi^-\pi^0$

¹From a Dalitz plot analysis in an isobar model.

²From a Dalitz plot analysis in a Veneziano model.

$$\Gamma(\rho(1450)^\pm \pi^\mp \rightarrow K_S^0 K^\pm \pi^\mp) / \Gamma(K_S^0 K^\pm \pi^\mp) \quad \Gamma_{25} / \Gamma_{169}$$

VALUE (%)	EVTS	DOCUMENT ID	TECN	COMMENT
$6.3 \pm 0.8 \pm 0.6$	4k	¹ LEES	17C BABR	$J/\psi \rightarrow K_S^0 K^\pm \pi^\mp$

¹ From a Dalitz plot analysis in an isobar model.

$$\Gamma(\rho(1450)^0 \pi^0 \rightarrow K^+ K^- \pi^0) / \Gamma(K^+ K^- \pi^0) \quad \Gamma_{26} / \Gamma_{168}$$

VALUE (%)	EVTS	DOCUMENT ID	TECN	COMMENT
$9.3 \pm 2.0 \pm 0.6$	2k	¹ LEES	17C BABR	$J/\psi \rightarrow K^+ K^- \pi^0$

¹ From a Dalitz plot analysis in an isobar model.

$$\Gamma(\rho(1450) \eta'(958) \rightarrow \pi^+ \pi^- \eta'(958)) / \Gamma_{\text{total}} \quad \Gamma_{27} / \Gamma$$

VALUE (units 10^{-6})	EVTS	DOCUMENT ID	TECN	COMMENT
$3.28 \pm 0.55 \pm 0.44$	119	¹ ABLIKIM	17AK BES3	$J/\psi \rightarrow \pi^+ \pi^- \eta'$

¹ From a partial wave analysis of the decay $J/\psi \rightarrow \pi^+ \pi^- \eta'$.

$$\Gamma(\rho(1700) \pi \rightarrow \pi^+ \pi^- \pi^0) / \Gamma(\pi^+ \pi^- \pi^0) \quad \Gamma_{29} / \Gamma_{151}$$

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
$8 \pm 2 \pm 5$	20k	¹ LEES	17C BABR	$J/\psi \rightarrow \pi^+ \pi^- \pi^0$

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

22 ± 6	20k	² LEES	17C BABR	$J/\psi \rightarrow \pi^+ \pi^- \pi^0$
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¹ From a Dalitz plot analysis in an isobar model.

² From a Dalitz plot analysis in a Veneziano model.

$$\Gamma(\rho(2150) \pi \rightarrow \pi^+ \pi^- \pi^0) / \Gamma(\pi^+ \pi^- \pi^0) \quad \Gamma_{31} / \Gamma_{151}$$

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
$4 \pm 1 \pm 20$	20k	¹ LEES	17C BABR	$J/\psi \rightarrow \pi^+ \pi^- \pi^0$

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

600 ± 250	20k	² LEES	17C BABR	$J/\psi \rightarrow \pi^+ \pi^- \pi^0$
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¹ From a Dalitz plot analysis in an isobar model.

² From a Dalitz plot analysis in a Veneziano model.

$$\Gamma(\rho_3(1690) \pi \rightarrow \pi^+ \pi^- \pi^0) / \Gamma(\pi^+ \pi^- \pi^0) \quad \Gamma_{32} / \Gamma_{151}$$

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
4.0 ± 0.8	20k	¹ LEES	17C BABR	$J/\psi \rightarrow \pi^+ \pi^- \pi^0$

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

4.0 ± 0.8	20k	¹ LEES	17C BABR	$J/\psi \rightarrow \pi^+ \pi^- \pi^0$
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¹ From a Dalitz plot analysis in a Veneziano model.

$$\Gamma(\omega \pi^0) / \Gamma_{\text{total}} \quad \Gamma_{33} / \Gamma$$

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.

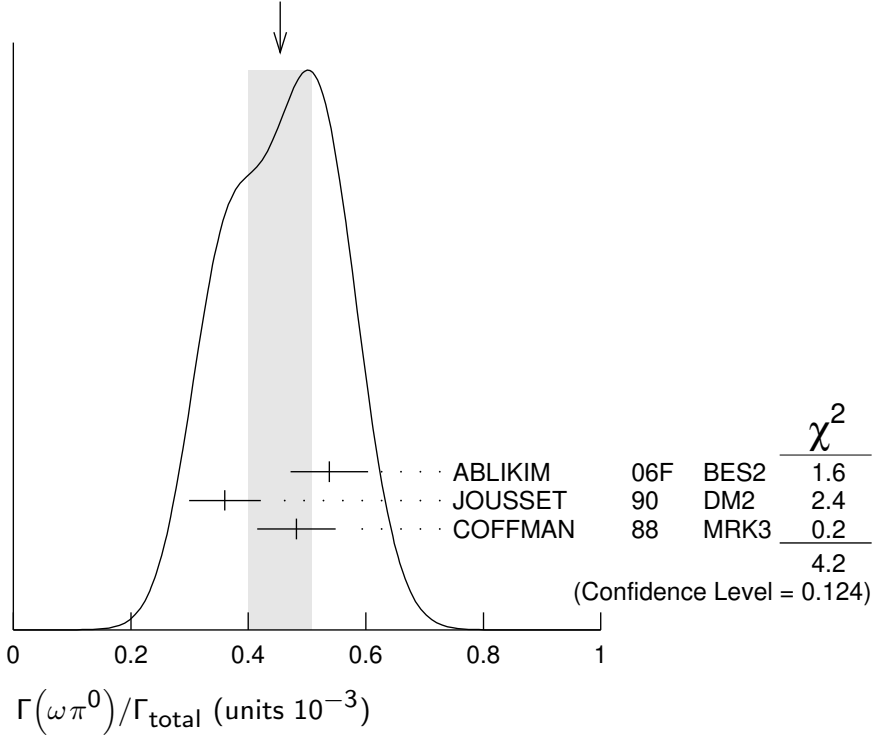
$0.538 \pm 0.012 \pm 0.065$	2090	¹ ABLIKIM	06F BES2	$J/\psi \rightarrow \omega \pi^0$
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$0.360 \pm 0.028 \pm 0.054$	222	JOUSSET	90 DM2	$J/\psi \rightarrow \text{hadrons}$
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$0.482 \pm 0.019 \pm 0.064$		COFFMAN	88 MRK3	$e^+ e^- \rightarrow \pi^0 \pi^+ \pi^- \pi^0$
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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)



$\Gamma(\omega\pi^0 \rightarrow \pi^+\pi^-\pi^0)/\Gamma(\pi^+\pi^-\pi^0)$ Γ_{34}/Γ_{151}

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
$8 \pm 3 \pm 2$	20k	¹ LEES	17c	BABR $J/\psi \rightarrow \pi^+\pi^-\pi^0$

¹ From a Dalitz plot analysis in an isobar model and significance 4.9σ .

$\Gamma(\omega\pi^+\pi^-)/\Gamma_{total}$ Γ_{35}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
7.2 ± 1.0 OUR AVERAGE				
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	$e^+e^- \rightarrow 2(\pi^+\pi^-)\pi^0$

$\Gamma(\omega\pi^0\pi^0)/\Gamma_{total}$ Γ_{36}/Γ

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

$\Gamma(\omega f_2(1270))/\Gamma_{total}$ Γ_{38}/Γ

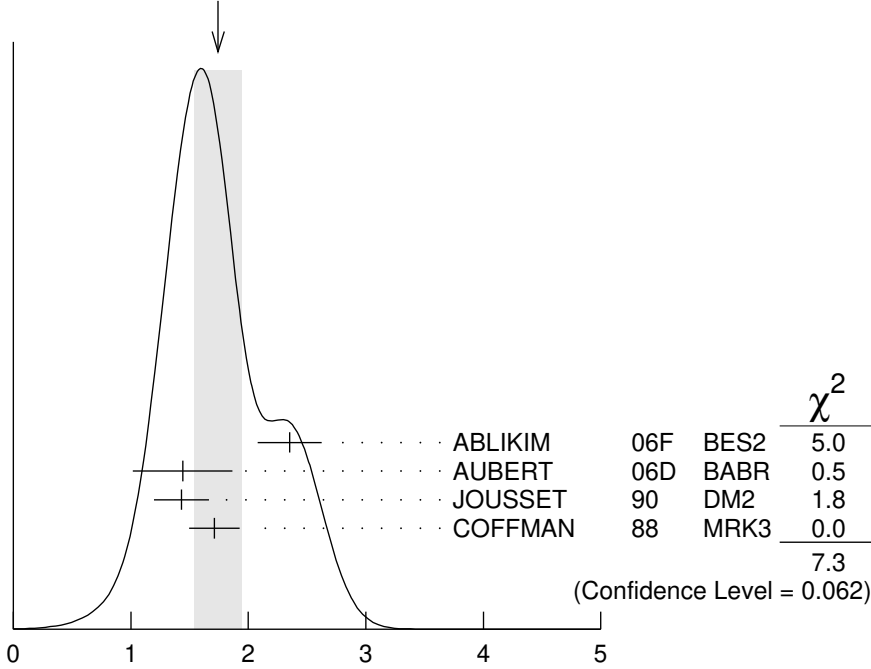
VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
4.3 ± 0.6 OUR AVERAGE				
$4.3 \pm 0.2 \pm 0.6$	5860	AUGUSTIN 89	DM2	e^+e^-
4.0 ± 1.6	70	BURMESTER 77D	PLUT	e^+e^-
••• We do not use the following data for averages, fits, limits, etc. •••				
1.9 ± 0.8	81	VANNUCCI 77	MRK1	$e^+e^- \rightarrow 2(\pi^+\pi^-)\pi^0$

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

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	$e^+e^- \rightarrow 3\pi\eta$

WEIGHTED AVERAGE
1.74±0.20 (Error scaled by 1.6)



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.

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

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

Γ_{42}/Γ

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

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

Γ_{44}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
1.12 ± 0.02 ± 0.13	14k	¹ ABLIKIM	19AC BES3	$J/\psi \rightarrow \omega\eta'\pi^+\pi^-$

¹ Using the decays $\omega \rightarrow \pi^+\pi^-\pi^0$ and $\eta' \rightarrow \eta\pi^+\pi^-$.

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

Γ_{45}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
1.89 ± 0.18	OUR AVERAGE			
2.08 ± 0.30 ± 0.14	137	¹ ABLIKIM	17AK BES3	$J/\psi \rightarrow \pi^+\pi^-\eta'$
2.26 ± 0.43	218	² ABLIKIM	06F BES2	$J/\psi \rightarrow \omega\eta'$

$1.8^{+1.0}_{-0.8} \pm 0.3$	6	JOUSSET	90	DM2	$J/\psi \rightarrow \text{hadrons}$
$1.66 \pm 0.17 \pm 0.19$		COFFMAN	88	MRK3	$e^+ e^- \rightarrow 3\pi\eta'$

¹ From a partial wave analysis of the decay $J/\psi \rightarrow \pi^+ \pi^- \eta'$.

² 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_{46}/Γ

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

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

$\Gamma(\omega f_0(1710) \rightarrow \omega K \bar{K})/\Gamma_{\text{total}}$ Γ_{47}/Γ

VALUE (units 10^{-4})		DOCUMENT ID	TECN	COMMENT
$4.8 \pm 1.1 \pm 0.3$	^{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.

$\Gamma(\omega f_1(1420))/\Gamma_{\text{total}}$ Γ_{48}/Γ

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

$\Gamma(\omega f'_2(1525))/\Gamma_{\text{total}}$ Γ_{49}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$< 2.2 \times 10^{-4}$	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. • • •
$< 2.8 \times 10^{-4}$	90	¹ FALVARD	88	DM2 $J/\psi \rightarrow \text{hadrons}$

¹ Re-evaluated assuming $B(f'_2(1525) \rightarrow K \bar{K}) = 0.713$.

$\Gamma(\omega X(1835) \rightarrow \omega p \bar{p})/\Gamma_{\text{total}}$ Γ_{50}/Γ

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

$\Gamma(\omega X(1835), X \rightarrow \eta' \pi^+ \pi^-)/\Gamma_{\text{total}}$ Γ_{51}/Γ

VALUE		DOCUMENT ID	TECN	COMMENT
$< 6.2 \times 10^{-5}$	¹	ABLIKIM	19AC	BES3 $J/\psi \rightarrow \omega \eta' \pi^+ \pi^-$

¹ Using the decays $\omega \rightarrow \pi^+ \pi^- \pi^0$ and $\eta' \rightarrow \eta \pi^+ \pi^-$.

$\Gamma(\omega K^\pm K_S^0 \pi^\mp)/\Gamma_{\text{total}}$ Γ_{52}/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 $e^+ e^- \rightarrow \text{hadrons}$

$\Gamma(\omega K \bar{K})/\Gamma_{\text{total}}$ Γ_{53}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
19 ± 4 OUR AVERAGE				
$19.8 \pm 2.1 \pm 3.9$		¹ FALVARD	88	DM2 $J/\psi \rightarrow \text{hadrons}$

16 ± 10 22 FELDMAN 77 MRK1 e^+e^- ¹ Addition of $\omega K^+ K^-$ and $\omega K^0 \bar{K}^0$ branching ratios. **$\Gamma(\omega K^*(892) \bar{K} + \text{c.c.})/\Gamma_{\text{total}}$** **$\Gamma_{54}/\Gamma$**

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

 $\Gamma(\eta' K^{*\pm} K^\mp)/\Gamma_{\text{total}}$ **Γ_{55}/Γ**

VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
1.48 \pm 0.13	OUR AVERAGE		
1.50 \pm 0.02 \pm 0.19	¹ ABLIKIM	18AB BES3	$J/\psi \rightarrow \eta' K^* \bar{K}$
1.47 \pm 0.03 \pm 0.17	² ABLIKIM	18AB BES3	$J/\psi \rightarrow \eta' K^* \bar{K}$

¹ From $\eta' K^+ K^- \pi^0$.² From $\eta' K_S^0 K^\pm \pi^\mp$. **$\Gamma(\eta' K^{*0} \bar{K}^0 + \text{c.c.})/\Gamma_{\text{total}}$** **$\Gamma_{56}/\Gamma$**

VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
1.66 \pm 0.03 \pm 0.21	¹ ABLIKIM	18AB BES3	$J/\psi \rightarrow \eta' K^* \bar{K}$

¹ From $\eta' K_S^0 K^\pm \pi^\mp$. **$\Gamma(\eta' h_1(1415) \rightarrow \eta' K^* \bar{K} + \text{c.c.})/\Gamma_{\text{total}}$** **$\Gamma_{57}/\Gamma$**

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
2.16 \pm 0.12 \pm 0.29	1.1k	¹ ABLIKIM	18AB BES3	$J/\psi \rightarrow \eta' h_1 \rightarrow \eta' K^* \bar{K}$

¹ From $\eta' K_S^0 K^\pm \pi^\mp$. **$\Gamma(\eta' h_1(1415) \rightarrow \eta' K^{*\pm} K^\mp)/\Gamma_{\text{total}}$** **$\Gamma_{58}/\Gamma$**

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
1.51 \pm 0.09 \pm 0.21	1.0k	¹ ABLIKIM	18AB BES3	$J/\psi \rightarrow \eta' h_1 \rightarrow \eta' K^* \bar{K}$

¹ From $\eta' K^+ K^- \pi^0$. **$\Gamma(\bar{K} K^*(892) + \text{c.c.} \rightarrow K_S^0 K^\pm \pi^\mp)/\Gamma(K_S^0 K^\pm \pi^\mp)$** **$\Gamma_{60}/\Gamma_{169}$**

VALUE (%)	EVTS	DOCUMENT ID	TECN	COMMENT
90.5 \pm 0.9 \pm 3.8	4k	¹ LEES	17C BABR	$J/\psi \rightarrow K_S^0 K^\pm \pi^\mp$

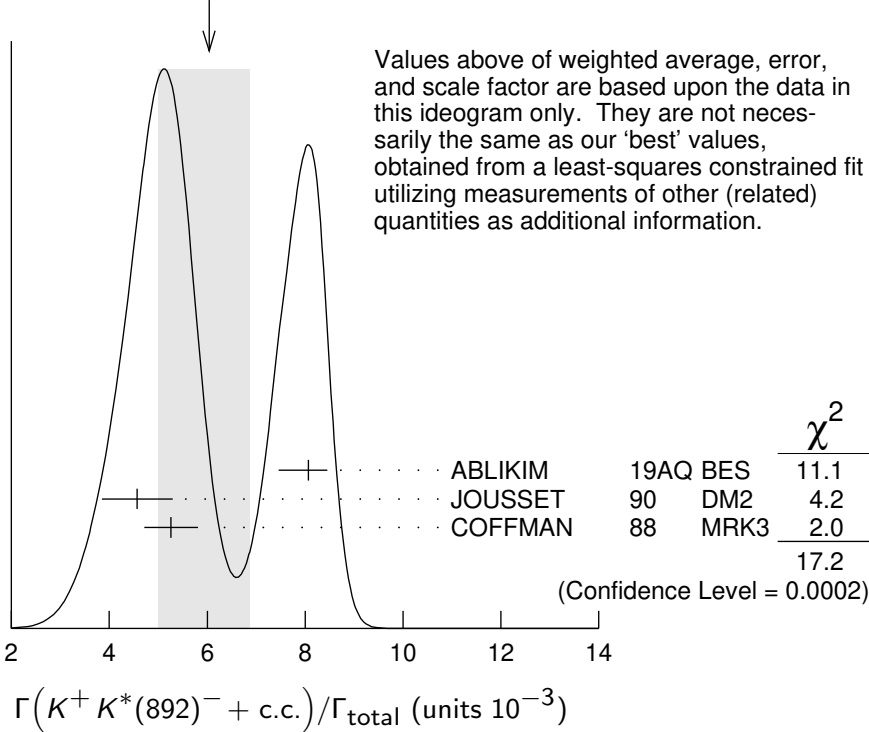
¹ From a Dalitz plot analysis in an isobar model. **$\Gamma(K^+ K^*(892)^- + \text{c.c.})/\Gamma_{\text{total}}$** **$\Gamma_{61}/\Gamma$**

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
6.0 $^{+0.8}_{-1.0}$	OUR AVERAGE			Error includes scale factor of 2.9. See the ideogram below.
8.07 \pm 0.04 $^{+0.38}_{-0.61}$	183k	ABLIKIM	19AQ BES	$J/\psi \rightarrow K^+ K^- \pi^0$
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	$J/\psi \rightarrow K^\pm X$

WEIGHTED AVERAGE
6.0+0.8-1.0 (Error scaled by 2.9)



$\Gamma(K^+ K^*(892)^- + c.c. \rightarrow K^+ K^- \pi^0) / \Gamma_{total}$ Γ_{62} / Γ

<u>VALUE (units 10^{-3})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
2.69 ± 0.01^{+0.13}_{-0.20}	183k	ABLIKIM	19AQ BES	$J/\psi \rightarrow K^+ K^- \pi^0$

$\Gamma(K^+ K^*(892)^- + c.c. \rightarrow K^+ K^- \pi^0) / \Gamma(K^+ K^- \pi^0)$ $\Gamma_{62} / \Gamma_{168}$

<u>VALUE (%)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
92.4 ± 1.5 ± 3.4	2k	¹ LEES	17C BABR	$J/\psi \rightarrow K^+ K^- \pi^0$

¹ From a Dalitz plot analysis in an isobar model.

$\Gamma(K^0 \bar{K}^*(892)^0 + c.c.) / \Gamma_{total}$ Γ_{64} / Γ

<u>VALUE (units 10^{-3})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
4.2 ± 0.4 OUR AVERAGE				
3.96 ± 0.15 ± 0.60	1192	JOUSSET	90 DM2	$J/\psi \rightarrow$ 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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$$\Gamma(\bar{K}^*(892)^0 K^+ \pi^- + \text{c.c.})/\Gamma_{\text{total}} \quad \Gamma_{66}/\Gamma$$

VALUE	DOCUMENT ID	TECN	COMMENT
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• • • We do not use the following data for averages, fits, limits, etc. • • •

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

¹ A $K_0^*(700)$ 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.

$$\Gamma(K^*(892)^0 K_S^0 \rightarrow \gamma K_S^0 K_S^0)/\Gamma_{\text{total}} \quad \Gamma_{70}/\Gamma$$

VALUE (units 10^{-6})	DOCUMENT ID	TECN	COMMENT
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$6.28^{+0.16+0.59}_{-0.17-0.52}$	ABLIKIM	18AA BES3	$J/\psi \rightarrow \gamma K_S^0 K_S^0$
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$$\Gamma(K^*(892)^\pm K^*(700)^\mp)/\Gamma_{\text{total}} \quad \Gamma_{72}/\Gamma$$

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
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$1.09 \pm 0.18^{+0.94}_{-0.54}$	655	ABLIKIM	10E BES2	$J/\psi \rightarrow K^\pm K_S^0 \pi^\mp \pi^0$
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$$\Gamma(K^*(892)^0 \bar{K}^*(892)^0)/\Gamma_{\text{total}} \quad \Gamma_{73}/\Gamma$$

VALUE (units 10^{-4})	CL%	DOCUMENT ID	TECN	COMMENT
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• • • We do not use the following data for averages, fits, limits, etc. • • •

<5	90	VANNUCCI	77 MRK1	$e^+ e^- \rightarrow \pi^+ \pi^- K^+ K^-$
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$$\Gamma(K^*(892)^\pm K^*(892)^\mp)/\Gamma_{\text{total}} \quad \Gamma_{74}/\Gamma$$

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
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$1.00 \pm 0.19^{+0.11}_{-0.32}$	323	ABLIKIM	10E BES2	$J/\psi \rightarrow K^\pm K_S^0 \pi^\mp \pi^0$
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$$\Gamma(K_1(1400)^\pm K^\mp)/\Gamma_{\text{total}} \quad \Gamma_{75}/\Gamma$$

VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
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$3.8 \pm 0.8 \pm 1.2$	¹ BAI	99c BES	$e^+ e^-$
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¹ Assuming $B(K_1(1400) \rightarrow K^* \pi) = 0.94 \pm 0.06$

$$\Gamma(K^*(1410) \bar{K} + \text{c.c.} \rightarrow K^\pm K^\mp \pi^0)/\Gamma(K^+ K^- \pi^0) \quad \Gamma_{77}/\Gamma_{168}$$

VALUE (%)	EVTS	DOCUMENT ID	TECN	COMMENT
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$2.3 \pm 1.1 \pm 0.7$	2k	¹ LEES	17c BABR	$J/\psi \rightarrow K^+ K^- \pi^0$
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¹ From a Dalitz plot analysis in an isobar model.

$$\Gamma(K^*(1410) \bar{K} + \text{c.c.} \rightarrow K_S^0 K^\pm \pi^\mp)/\Gamma(K_S^0 K^\pm \pi^\mp) \quad \Gamma_{78}/\Gamma_{169}$$

VALUE (%)	EVTS	DOCUMENT ID	TECN	COMMENT
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$1.5 \pm 0.5 \pm 0.9$	4k	¹ LEES	17c BABR	$J/\psi \rightarrow K_S^0 K^\pm \pi^\mp$
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¹ From a Dalitz plot analysis in an isobar model.

$$\Gamma(K_2^*(1430) \bar{K} + \text{c.c.} \rightarrow K^\pm K^\mp \pi^0)/\Gamma(K^+ K^- \pi^0) \quad \Gamma_{80}/\Gamma_{168}$$

VALUE (%)	EVTS	DOCUMENT ID	TECN	COMMENT
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$3.5 \pm 1.3 \pm 0.9$	2k	¹ LEES	17c BABR	$J/\psi \rightarrow K^+ K^- \pi^0$
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¹ From a Dalitz plot analysis in an isobar model.

$$\Gamma(K_2^*(1430)\bar{K} + \text{c.c.} \rightarrow K_S^0 K^\pm \pi^\mp) / \Gamma(K_S^0 K^\pm \pi^\mp) \quad \Gamma_{81}/\Gamma_{169}$$

VALUE (%)	EVTS	DOCUMENT ID	TECN	COMMENT
$7.1 \pm 1.3 \pm 1.2$	4k	¹ LEES	17C	BABR $J/\psi \rightarrow K_S^0 K^\pm \pi^\mp$

¹ From a Dalitz plot analysis in an isobar model.

$$\Gamma(\bar{K}_2^*(1430)K + \text{c.c.}) / \Gamma_{\text{total}} \quad \Gamma_{82}/\Gamma$$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$< 40 \times 10^{-4}$	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. • • •				
$< 66 \times 10^{-4}$	90	BRAUNSCH...	76	DASP $e^+ e^- \rightarrow K^\pm \bar{K}_2^{*\mp}$

$$\Gamma(K_2^*(1430)^+ K^- + \text{c.c.} \rightarrow K^+ K^- \pi^0) / \Gamma_{\text{total}} \quad \Gamma_{83}/\Gamma$$

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
$2.69 \pm 0.04^{+0.25}_{-0.19}$	183k	ABLIKIM	19AQ	BES $J/\psi \rightarrow K^+ K^- \pi^0$

$$\Gamma(\bar{K}_2^*(1430)^0 K^*(892)^0 + \text{c.c.}) / \Gamma_{\text{total}} \quad \Gamma_{85}/\Gamma$$

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
6.7 ± 2.6	40	VANNUCCI	77	MRK1 $e^+ e^- \rightarrow \pi^+ \pi^- K^+ K^-$

$$\Gamma(K_2^*(1430)^0 \bar{K}_2^*(1430)^0) / \Gamma_{\text{total}} \quad \Gamma_{88}/\Gamma$$

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

$$\Gamma(K_2^*(1980)^+ K^- + \text{c.c.} \rightarrow K^+ K^- \pi^0) / \Gamma_{\text{total}} \quad \Gamma_{90}/\Gamma$$

VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT
$1.1 \pm 0.1^{+0.6}_{-0.1}$	183k	ABLIKIM	19AQ	BES $J/\psi \rightarrow K^+ K^- \pi^0$

$$\Gamma(K_4^*(2045)^+ K^- + \text{c.c.} \rightarrow K^+ K^- \pi^0) / \Gamma_{\text{total}} \quad \Gamma_{91}/\Gamma$$

VALUE (units 10^{-6})	EVTS	DOCUMENT ID	TECN	COMMENT
$6.2 \pm 0.7^{+2.8}_{-1.4}$	183k	ABLIKIM	19AQ	BES $J/\psi \rightarrow K^+ K^- \pi^0$

$$\Gamma(K_1(1270)^\pm K^\mp) / \Gamma_{\text{total}} \quad \Gamma_{92}/\Gamma$$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$< 3.0 \times 10^{-3}$	90	¹ BAI	99C	BES $e^+ e^-$

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

$$\Gamma(K_1(1270)K_S^0 \rightarrow \gamma K_S^0 K_S^0) / \Gamma_{\text{total}} \quad \Gamma_{93}/\Gamma$$

VALUE (units 10^{-7})	DOCUMENT ID	TECN	COMMENT
$8.54^{+1.07+2.35}_{-1.20-2.13}$	ABLIKIM	18AA	BES3 $J/\psi \rightarrow \gamma K_S^0 K_S^0$

$$\Gamma(a_2(1320)^\pm \pi^\mp) / \Gamma_{\text{total}} \quad \Gamma_{94}/\Gamma$$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$< 43 \times 10^{-4}$	90	BRAUNSCH...	76	DASP $e^+ e^-$

$\Gamma(\phi\pi^0)/\Gamma_{\text{total}}$ Γ_{95}/Γ

The two different fit values of ABLIKIM 15K below have the same statistical significance of 6.4σ and cannot be distinguished at this moment.

<u>VALUE (units 10^{-6})</u>	<u>CL%</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$2.94 \pm 0.16 \pm 0.16$		0.8k	¹ ABLIKIM	15K BES3	$e^+e^- \rightarrow J/\psi \rightarrow K^+K^-\gamma\gamma$
$0.124 \pm 0.033 \pm 0.030$		35 ± 9	² ABLIKIM	15K BES3	$e^+e^- \rightarrow J/\psi \rightarrow K^+K^-\gamma\gamma$

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

<6.4	90		³ ABLIKIM	05B BES2	$e^+e^- \rightarrow J/\psi \rightarrow \phi\gamma\gamma$
<6.8	90		COFFMAN	88 MRK3	$e^+e^- \rightarrow K^+K^-\pi^0$

¹ Corresponding to one of the two fit solutions with $\delta = (-95.9 \pm 1.5)^\circ$ for the phase angle between the resonant $J/\psi \rightarrow \phi\pi^0$ and non-phi $J/\psi \rightarrow K^+K^-\pi^0$ contributions.

² Corresponding to one of the two fit solutions with $\delta = (-152.1 \pm 7.7)^\circ$ for the phase angle between the resonant $J/\psi \rightarrow \phi\pi^0$ and non-phi $J/\psi \rightarrow K^+K^-\pi^0$ contributions.

³ Superseded by ABLIKIM 15K.

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

<u>VALUE (units 10^{-3})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.94 ± 0.15 OUR AVERAGE				Error includes scale factor of 1.7.
$1.09 \pm 0.02 \pm 0.13$		ABLIKIM	05 BES2	$J/\psi \rightarrow \phi\pi^+\pi^-$
$0.78 \pm 0.03 \pm 0.12$		FALVARD	88 DM2	$J/\psi \rightarrow \text{hadrons}$
2.1 ± 0.9	23	FELDMAN	77 MRK1	e^+e^-

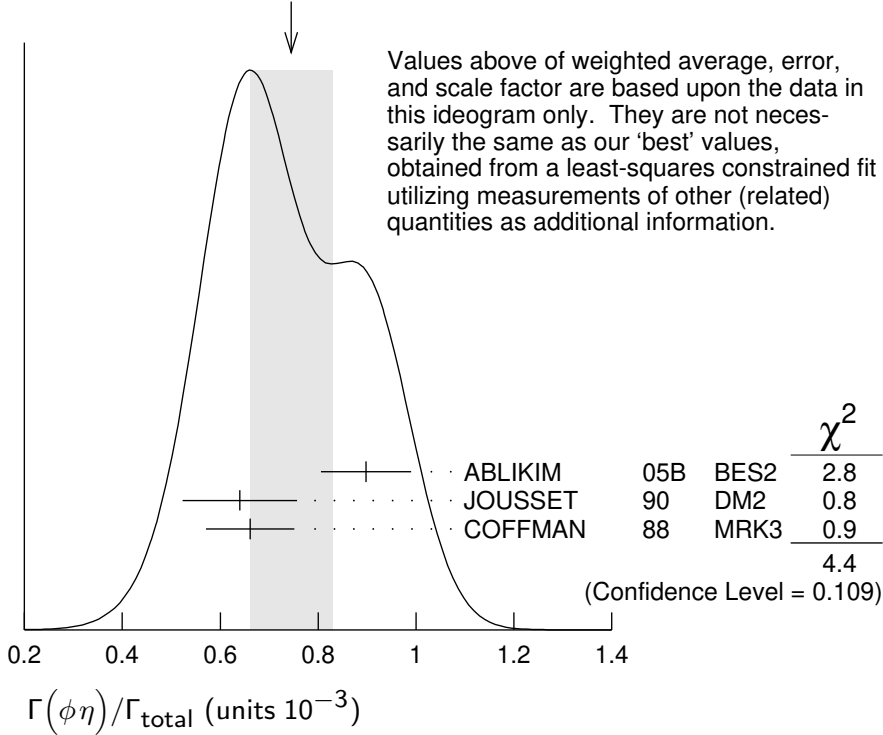
 $\Gamma(\phi 2(\pi^+\pi^-))/\Gamma_{\text{total}}$ Γ_{98}/Γ

<u>VALUE (units 10^{-4})</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$16.0 \pm 1.0 \pm 3.0$	FALVARD	88 DM2	$J/\psi \rightarrow \text{hadrons}$

 $\Gamma(\phi\eta)/\Gamma_{\text{total}}$ Γ_{99}/Γ

<u>VALUE (units 10^{-3})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.74 ± 0.08 OUR AVERAGE				Error includes scale factor of 1.5. See the ideogram below.
$0.898 \pm 0.024 \pm 0.089$		ABLIKIM	05B BES2	$e^+e^- \rightarrow J/\psi \rightarrow \text{hadr}$
$0.64 \pm 0.04 \pm 0.11$	346	JOUSSET	90 DM2	$J/\psi \rightarrow \text{hadrons}$
$0.661 \pm 0.045 \pm 0.078$		COFFMAN	88 MRK3	$e^+e^- \rightarrow K^+K^-\eta$

WEIGHTED AVERAGE
 0.74 ± 0.08 (Error scaled by 1.5)

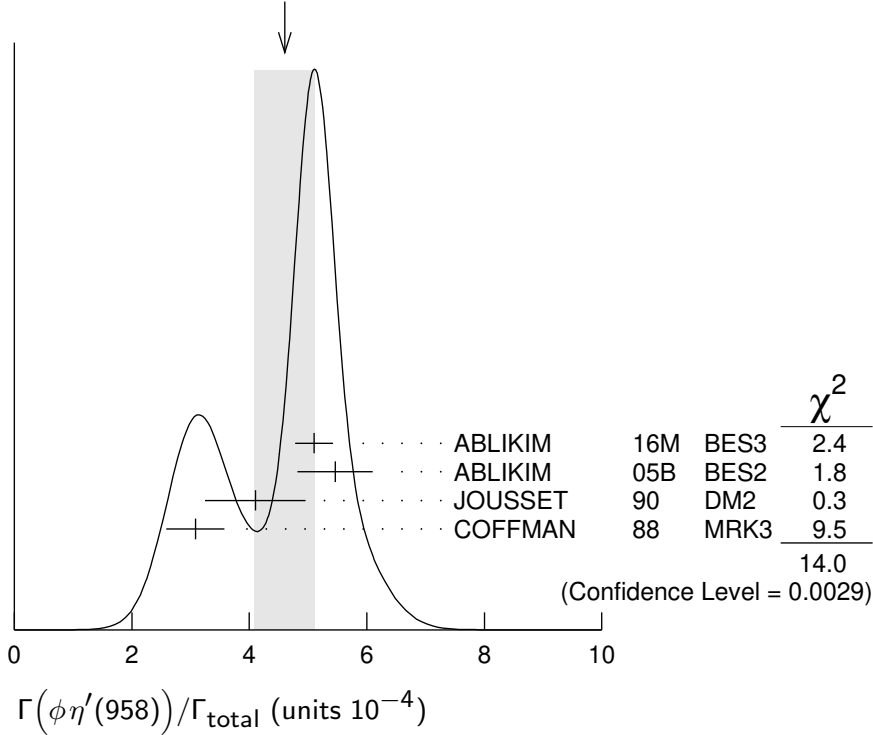


$\Gamma(\phi\eta'(958))/\Gamma_{\text{total}}$

Γ_{100}/Γ

VALUE (units 10^{-4})	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
4.6 ± 0.5	OUR AVERAGE				Error includes scale factor of 2.2. See the ideogram below.
$5.10 \pm 0.03 \pm 0.32$		31k	ABLIKIM	16M BES3	$e^+e^- \rightarrow J/\psi \rightarrow \text{hadrons}$
$5.46 \pm 0.31 \pm 0.56$			ABLIKIM	05B BES2	$e^+e^- \rightarrow J/\psi \rightarrow \text{hadrons}$
$4.1 \pm 0.3 \pm 0.8$		167	JOUSSET	90 DM2	$J/\psi \rightarrow \text{hadrons}$
$3.08 \pm 0.34 \pm 0.36$			COFFMAN	88 MRK3	$e^+e^- \rightarrow K^+K^-\eta'$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●					
< 13		90	VANNUCCI	77 MRK1	e^+e^-

WEIGHTED AVERAGE
 4.6 ± 0.5 (Error scaled by 2.2)



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

Γ_{101} / Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
$2.32 \pm 0.06 \pm 0.16$	2.2k	¹ ABLIKIM	19AN BES3	$e^+ e^- \rightarrow J/\psi \rightarrow \text{hadrons}$

¹ Including contributions from intermediate resonances. Evidence for an intermediate resonance at $M \approx 2$ GeV and $\Gamma \approx 150$ MeV decaying to $\phi \eta'$ with $J^P = 1^+ \text{ or } 1^-$, and $B(J/\psi \rightarrow \eta X) \times B(X \rightarrow \phi \eta') \approx 10^{-4}$.

$\Gamma(\phi f_0(980)) / \Gamma_{\text{total}}$

Γ_{102} / 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 $B(f_0(980) \rightarrow \pi \pi) = 0.78$.

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

Γ_{105} / Γ

VALUE (units 10^{-6})	EVTS	DOCUMENT ID	TECN	COMMENT
$4.50 \pm 0.80 \pm 0.61$	355	ABLIKIM	15P BES3	$J/\psi \rightarrow K^+ K^- 3\pi$

$\Gamma(\phi \pi^0 f_0(980) \rightarrow \phi \pi^0 \rho^0 \pi^0) / \Gamma_{\text{total}}$

Γ_{106} / Γ

VALUE (units 10^{-6})	EVTS	DOCUMENT ID	TECN	COMMENT
$1.67 \pm 0.50 \pm 0.24$	70	ABLIKIM	15P BES3	$J/\psi \rightarrow K^+ K^- 3\pi$

$\Gamma(\phi f_0(980)\eta \rightarrow \eta\phi\pi^+\pi^-)/\Gamma_{\text{total}}$ Γ_{107}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
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_{108}/Γ

VALUE (units 10^{-6})	DOCUMENT ID	TECN	COMMENT
4.37±1.35	¹ ABLIKIM	18D	BES3 $J/\psi \rightarrow \phi\eta\pi^0$

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

5.0 ± 2.7 ± 2.5	² ABLIKIM	11D	BES3 $J/\psi \rightarrow \phi\eta\pi^0$
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¹ Assuming constructive interference between $a_0(980) - f_0(980)$ mixing and electromagnetic decay. Destructive interference gives a value of $(4.93 \pm 1.77) \times 10^{-6}$ for this branching fraction.

² Assuming $a_0(980) - f_0(980)$ mixing and isospin breaking via γ^* and K^*K loops.

 $\Gamma(\phi f_2(1270))/\Gamma_{\text{total}}$ Γ_{109}/Γ

VALUE (units 10^{-3})	CL%	DOCUMENT ID	TECN	COMMENT
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• • • 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 $e^+e^- \rightarrow \pi^+\pi^-K^+K^-$

 $\Gamma(\phi f_1(1285))/\Gamma_{\text{total}}$ Γ_{110}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
2.6±0.5 OUR AVERAGE				

3.4±1.8±1.5	1.1k	¹ ABLIKIM	15H	BES3 $e^+e^- \rightarrow J/\psi \rightarrow \phi\eta\pi^+\pi^-$
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3.2±0.6±0.4		JOUSSET	90	DM2 $J/\psi \rightarrow \phi 2(\pi^+\pi^-)$
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2.1±0.5±0.4	25	² JOUSSET	90	DM2 $J/\psi \rightarrow \phi\eta\pi^+\pi^-$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

0.6±0.2±0.1	16	BECKER	87	MRK3 $J/\psi \rightarrow \phi K\bar{K}\pi$
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¹ ABLIKIM 15H reports $[\Gamma(J/\psi(15) \rightarrow \phi f_1(1285))/\Gamma_{\text{total}}] \times [B(f_1(1285) \rightarrow \eta\pi^+\pi^-)] = (1.20 \pm 0.6 \pm 0.14) \times 10^{-4}$ which we divide by our best value $B(f_1(1285) \rightarrow \eta\pi^+\pi^-) = (35 \pm 15) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

² We attribute to the $f_1(1285)$ the signal observed in the $\pi^+\pi^-\eta$ invariant mass distribution at 1297 MeV.

 $\Gamma(\phi f_1(1285) \rightarrow \phi\pi^0 f_0(980) \rightarrow \phi\pi^0\pi^+\pi^-)/\Gamma_{\text{total}}$ Γ_{111}/Γ

VALUE (units 10^{-7})	EVTS	DOCUMENT ID	TECN	COMMENT
9.36±2.31±1.54	78	ABLIKIM	15P	BES3 $J/\psi \rightarrow K^+K^-3\pi$

 $\Gamma(\phi f_1(1285) \rightarrow \phi\pi^0 f_0(980) \rightarrow \phi 3\pi^0)/\Gamma_{\text{total}}$ Γ_{112}/Γ

VALUE (units 10^{-7})	EVTS	DOCUMENT ID	TECN	COMMENT
2.08±1.63±1.47	9	ABLIKIM	15P	BES3 $J/\psi \rightarrow K^+K^-3\pi$

 $\Gamma(\phi\eta(1405) \rightarrow \phi\eta\pi^+\pi^-)/\Gamma_{\text{total}}$ Γ_{113}/Γ

VALUE (units 10^{-5})	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
2.01±0.58±0.82		172	¹ ABLIKIM	15H	BES3 $e^+e^- \rightarrow J/\psi \rightarrow \phi\eta\pi^+\pi^-$

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

< 17 90 ² FALVARD 88 DM2 $J/\psi \rightarrow$ hadrons

¹ With 3.6 σ significance.

² Includes unknown branching fraction $\eta(1405) \rightarrow \eta\pi\pi$.

$\Gamma(\phi f'_2(1525))/\Gamma_{\text{total}}$ Γ_{114}/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 $J/\psi \rightarrow$ 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 $f_0(1710)$.

$\Gamma(\phi X(1835) \rightarrow \phi p\bar{p})/\Gamma_{\text{total}}$ Γ_{115}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
< 2.1 × 10⁻⁷	90	¹ ABLIKIM	16K	BES3 $J/\psi \rightarrow p\bar{p}K_S^0 K_L^0$, $p\bar{p}K^+ K^-$

¹ Upper limit applies to any $p\bar{p}$ mass enhancement near threshold.

$\Gamma(\phi X(1835) \rightarrow \phi \eta \pi^+ \pi^-)/\Gamma_{\text{total}}$ Γ_{116}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
< 2.8 × 10⁻⁴	90	ABLIKIM	15H	BES3 $e^+ e^- \rightarrow J/\psi \rightarrow \phi \eta \pi^+ \pi^-$

$\Gamma(\phi X(1870) \rightarrow \phi \eta \pi^+ \pi^-)/\Gamma_{\text{total}}$ Γ_{117}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
< 6.13 × 10⁻⁵	90	ABLIKIM	15H	BES3 $e^+ e^- \rightarrow J/\psi \rightarrow \phi \eta \pi^+ \pi^-$

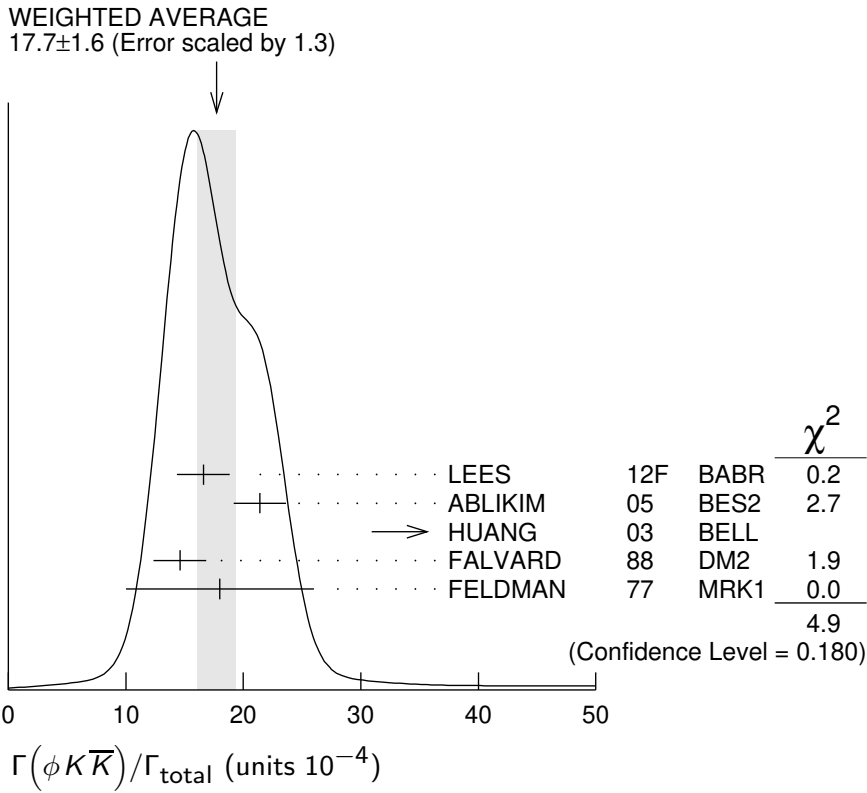
$\Gamma(\phi K\bar{K})/\Gamma_{\text{total}}$ Γ_{118}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
17.7 ± 1.6 OUR AVERAGE		Error includes scale factor of 1.3. See the ideogram below.		
16.6 ± 1.9 ± 1.2	163 ± 19	LEES	12F	BABR $10.6 e^+ e^- \rightarrow 2(K^+ K^-)\gamma$
21.4 ± 0.4 ± 2.2		ABLIKIM	05	BES2 $J/\psi \rightarrow \phi \pi^+ \pi^-$
48 $\begin{smallmatrix} +20 \\ -16 \end{smallmatrix}$ ± 6	9.0 $\begin{smallmatrix} +3.7 \\ -3.0 \end{smallmatrix}$	^{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_{119}/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 $f_0(1710) \rightarrow K \bar{K}$.

$\Gamma(\phi K^\pm K_S^0 \pi^\mp)/\Gamma_{\text{total}}$ **Γ_{122}/Γ**

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

$\Gamma(\phi K^*(892) \bar{K} + \text{c.c.})/\Gamma_{\text{total}}$ **Γ_{123}/Γ**

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

$\Gamma(b_1(1235)^\pm \pi^\mp)/\Gamma_{\text{total}}$ **Γ_{124}/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	$e^+ e^-$

$\Gamma(b_1(1235)^0 \pi^0)/\Gamma_{\text{total}}$					Γ_{125}/Γ
VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT	
23±3±5	229	AUGUSTIN 89	DM2	$e^+ e^-$	
$\Gamma(\Delta(1232)^+ \bar{p})/\Gamma_{\text{total}}$					Γ_{127}/Γ
VALUE	CL%	DOCUMENT ID	TECN	COMMENT	
<0.1 × 10⁻³	90	HENRARD 87	DM2	$e^+ e^-$	
$\Gamma(\Delta(1232)^{++} \bar{p} \pi^-)/\Gamma_{\text{total}}$					Γ_{128}/Γ
VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT	
1.58±0.23±0.40	332	EATON 84	MRK2	$e^+ e^-$	
$\Gamma(\Delta(1232)^{++} \bar{\Delta}(1232)^{--})/\Gamma_{\text{total}}$					Γ_{129}/Γ
VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT	
1.10±0.09±0.28	233	EATON 84	MRK2	$e^+ e^-$	
$\Gamma(\bar{\Sigma}(1385)^0 p K^-)/\Gamma_{\text{total}}$					Γ_{130}/Γ
VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT	
0.51±0.26±0.18	89	EATON 84	MRK2	$e^+ e^-$	
$\Gamma(\Sigma(1385)^0 \bar{\Lambda} + \text{c.c.})/\Gamma_{\text{total}}$					Γ_{131}/Γ
VALUE	CL%	DOCUMENT ID	TECN	COMMENT	
<0.82 × 10⁻⁵	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. • • •					
<0.2 × 10 ⁻³	90	HENRARD 87	DM2	$e^+ e^-$	
$\Gamma(\Sigma(1385)^- \bar{\Sigma}^+ (\text{or c.c.}))/\Gamma_{\text{total}}$					Γ_{132}/Γ
VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT	
0.31±0.05 OUR AVERAGE					
0.30±0.03±0.07	74 ± 8	HENRARD 87	DM2	$e^+ e^- \rightarrow \Sigma^{*-}$	
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	$e^+ e^- \rightarrow \Sigma^{*+}$	
$\Gamma(\Sigma(1385)^- \bar{\Sigma}(1385)^+ (\text{or c.c.}))/\Gamma_{\text{total}}$					Γ_{133}/Γ
VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT	
1.16 ±0.05 OUR AVERAGE					
1.096±0.012±0.071	43k	ABLIKIM 16L	BES3	$J/\psi \rightarrow \Sigma(1385)^- \bar{\Sigma}(1385)^+$	
1.258±0.014±0.078	53k	ABLIKIM 16L	BES3	$J/\psi \rightarrow \Sigma(1385)^+ \bar{\Sigma}(1385)^-$	
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	$e^+ e^- \rightarrow \Sigma^{*+}$	

$\Gamma(\Sigma(1385)^0 \bar{\Sigma}(1385)^0)/\Gamma_{\text{total}}$ Γ_{134}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
$1.071 \pm 0.009 \pm 0.082$	103k	ABLIKIM	17E BES3	$e^+ e^- \rightarrow J/\psi \rightarrow$ hadrons

 $\Gamma(\Lambda(1520) \bar{\Lambda} + \text{c.c.} \rightarrow \gamma \Lambda \bar{\Lambda})/\Gamma_{\text{total}}$ Γ_{135}/Γ

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

 $\Gamma(\bar{\Lambda}(1520) \Lambda + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{136}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$< 1.80 \times 10^{-3}$	90	LU	19 BELL	$B^+ \rightarrow \bar{p} \Lambda K^+ K^+$

 $\Gamma(\Xi^0 \Xi^0)/\Gamma_{\text{total}}$ Γ_{137}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
1.17 ± 0.04 OUR AVERAGE				
$1.165 \pm 0.004 \pm 0.043$	135k	ABLIKIM	17E BES3	$e^+ e^- \rightarrow J/\psi \rightarrow$ hadrons
$1.20 \pm 0.12 \pm 0.21$	206	ABLIKIM	08O BES2	$e^+ e^- \rightarrow J/\psi$

 $\Gamma(\Xi(1530)^- \Xi^+ + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{138}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
0.318 ± 0.008 OUR AVERAGE				
$0.317 \pm 0.002 \pm 0.008$	70k	ABLIKIM	20 BES3	$e^+ e^- \rightarrow J/\psi$
$0.59 \pm 0.09 \pm 0.12$	75	HENRARD	87 DM2	$e^+ e^-$

 $\Gamma(\Xi(1530)^0 \Xi^0)/\Gamma_{\text{total}}$ Γ_{139}/Γ

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

 $\Gamma(\Theta(1540) \bar{\Theta}(1540) \rightarrow K_S^0 p K^- \bar{n} + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{140}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$< 1.1 \times 10^{-5}$	90	BAI	04G BES2	$e^+ e^-$

 $\Gamma(\Theta(1540) K^- \bar{n} \rightarrow K_S^0 p K^- \bar{n})/\Gamma_{\text{total}}$ Γ_{141}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$< 2.1 \times 10^{-5}$	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_{142}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$< 1.6 \times 10^{-5}$	90	BAI	04G BES2	$e^+ e^-$

 $\Gamma(\bar{\Theta}(1540) K^+ n \rightarrow K_S^0 \bar{p} K^+ n)/\Gamma_{\text{total}}$ Γ_{143}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$< 5.6 \times 10^{-5}$	90	BAI	04G BES2	$e^+ e^-$

 $\Gamma(\bar{\Theta}(1540) K_S^0 p \rightarrow K_S^0 p K^- \bar{n})/\Gamma_{\text{total}}$ Γ_{144}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$< 1.1 \times 10^{-5}$	90	BAI	04G BES2	$e^+ e^-$

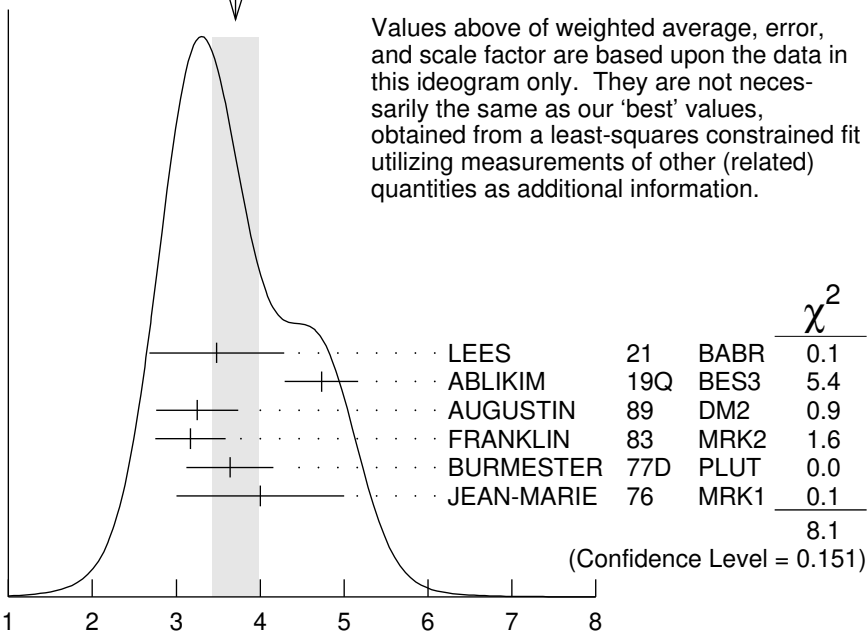
STABLE HADRONS

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

Γ_{145}/Γ

VALUE (units 10^{-2})	EVTS	DOCUMENT ID	TECN	COMMENT
3.71±0.28 OUR AVERAGE		Error includes scale factor of 1.3. See the ideogram below.		
3.5 ±0.8 ±0.1	14k	¹ LEES 21	BABR	10.6 $e^+e^- \rightarrow 2(\pi^+\pi^-)3\pi^0\gamma$
4.73±0.44	228k	² ABLIKIM 19Q	BES3	$J/\psi \rightarrow 2(\pi^+\pi^-)\pi^0$
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^-

WEIGHTED AVERAGE
3.71±0.28 (Error scaled by 1.3)



¹ LEES 21 reports $[\Gamma(J/\psi(1S) \rightarrow 2(\pi^+\pi^-)\pi^0)/\Gamma_{\text{total}}] \times [\Gamma(\psi(2S) \rightarrow e^+e^-)] \times [B(\psi(2S) \rightarrow J/\psi(1S)\pi^0\pi^0)] = (14.8 \pm 2.6 \pm 2.2) \times 10^{-3}$ keV which we divide by our best values $\Gamma(\psi(2S) \rightarrow e^+e^-) = 2.33 \pm 0.04$ keV, $B(\psi(2S) \rightarrow J/\psi(1S)\pi^0\pi^0) = (18.24 \pm 0.31) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best values.

² From an energy scan of $e^+e^- \rightarrow J/\psi \rightarrow 2(\pi^+\pi^-)\pi^0$, assuming PDG 16 values for $\Gamma(e^+e^-)$, $\Gamma(\mu^+\mu^-)$, and $\Gamma(\text{total})$, and for a phase difference between strong and electromagnetic amplitudes of $(84.9 \pm 3.6)^\circ$. An alternative solution is $(4.85 \pm 0.45)\%$ with a phase of $(-84.7 \pm 3.1)^\circ$.

$\Gamma(2(\pi^+\pi^-)\pi^0)/\Gamma_{\text{total}}$ (units 10^{-2})

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

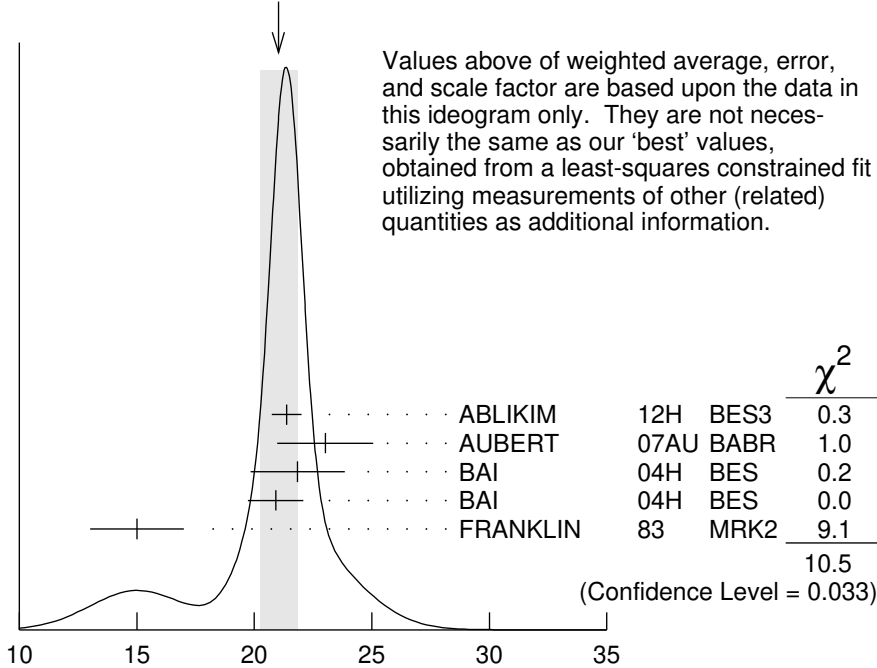
Γ_{146}/Γ

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

$\Gamma(\pi^+\pi^-\pi^0)/\Gamma_{\text{total}}$ Γ_{151}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
21.0 ± 0.8	OUR AVERAGE	Error includes scale factor of 1.6. See the ideogram below.		
21.37 ± 0.04 ^{+0.64} _{-0.62}	1.8M	1,2 ABLIKIM	12H BES3	$e^+e^- \rightarrow J/\psi$
23.0 ± 2.0 ± 0.4	256	3 AUBERT	07AU BABR	10.6 $e^+e^- \rightarrow J/\psi\pi^+\pi^-\gamma$
21.84 ± 0.05 ± 2.01	220k	1,4 BAI	04H BES	e^+e^-
20.91 ± 0.21 ± 1.16		4,5 BAI	04H BES	e^+e^-
15 ± 2	168	FRANKLIN	83 MRK2	e^+e^-

WEIGHTED AVERAGE
21.0 ± 0.8 (Error scaled by 1.6)



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 $\Gamma(\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-) \times \Gamma(\psi(2S) \rightarrow e^+e^-)/\Gamma_{\text{total}} = 0.808 \pm 0.013$ keV. Our first error is their experiment's error and our second error is the systematic error from using our best value.

⁴ Mostly $\rho\pi$, see also $\rho\pi$ subsection.

⁵ 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 $B(J/\psi \rightarrow \mu^+\mu^-) = 5.88 \pm 0.10\%$.

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

$\Gamma(\pi^+\pi^-\pi^0K^+K^-)/\Gamma_{\text{total}}$ Γ_{153}/Γ

VALUE (units 10^{-2})	EVTS	DOCUMENT ID	TECN	COMMENT
1.2 ± 0.3	309	VANNUCCI	77 MRK1	e^+e^-

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

<u>VALUE (units 10^{-4})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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.

 $\Gamma(2(\pi^+\pi^-))/\Gamma_{\text{total}}$ Γ_{155}/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^-

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

 $\Gamma(3(\pi^+\pi^-))/\Gamma_{\text{total}}$ Γ_{156}/Γ

<u>VALUE (units 10^{-4})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
• • • We do not use the following data for averages, fits, limits, etc. • • •				
40±20	32	JEAN-MARIE 76	MRK1	e^+e^-

 $\Gamma(4(\pi^+\pi^-)\pi^0)/\Gamma_{\text{total}}$ Γ_{158}/Γ

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

 $\Gamma(2(\pi^+\pi^-)\eta)/\Gamma_{\text{total}}$ Γ_{159}/Γ

<u>VALUE (units 10^{-3})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
2.29±0.28 OUR AVERAGE				
3.1 ±1.5 ±0.1	14k	¹ LEES 21	BABR	10.6 $e^+e^- \rightarrow$ $2(\pi^+\pi^-)3\pi^0\gamma$
2.26±0.08±0.27	4.8k	ABLIKIM 05C	BES2	$e^+e^- \rightarrow 2(\pi^+\pi^-)\eta$

¹ LEES 21 reports $[\Gamma(J/\psi(1S) \rightarrow 2(\pi^+\pi^-)\eta)/\Gamma_{\text{total}}] \times [\Gamma(J/\psi(1S) \rightarrow e^+e^-)] \times [B(\eta \rightarrow 3\pi^0)] = (5.6 \pm 2.6 \pm 0.8) \times 10^{-3}$ keV which we divide by our best values $\Gamma(J/\psi(1S) \rightarrow e^+e^-) = 5.53 \pm 0.10$ keV, $B(\eta \rightarrow 3\pi^0) = (32.57 \pm 0.21) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best values.

 $\Gamma(3(\pi^+\pi^-)\eta)/\Gamma_{\text{total}}$ Γ_{160}/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	$e^+e^- \rightarrow 3(\pi^+\pi^-)\eta$

 $\Gamma(K^+K^-)/\Gamma_{\text{total}}$ Γ_{164}/Γ

<u>VALUE (units 10^{-4})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
2.86±0.09±0.19	1k	¹ METREVELI 12		$\psi(2S) \rightarrow \pi^+\pi^-K^+K^-$

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

$2.39 \pm 0.24 \pm 0.22$	107	² BALTRUSAIT...85D	MRK3	e^+e^-
2.2 ± 0.9	6	² BRANDELIK	79C	DASP e^+e^-

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

² Interference with non-resonant K^+K^- production not taken into account.

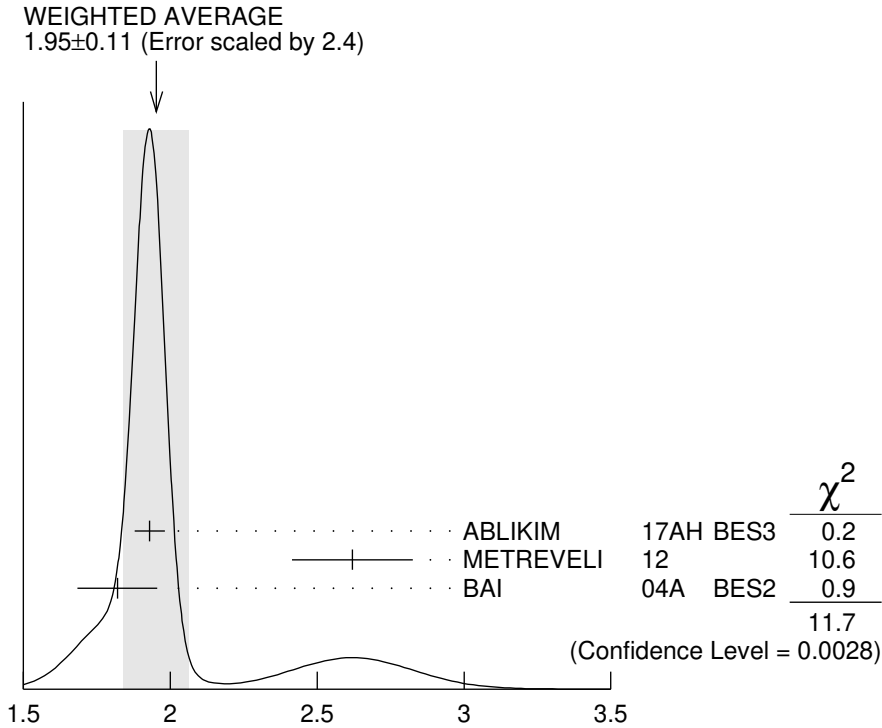
$\Gamma(K_S^0 K_L^0)/\Gamma_{\text{total}}$

Γ_{165}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
1.95 ± 0.11	OUR AVERAGE	Error includes scale factor of 2.4. See the ideogram below.		
$1.93 \pm 0.01 \pm 0.05$	110k	ABLIKIM	17AH BES3	$J/\psi \rightarrow K_S^0 K_L^0 \rightarrow \pi^+ \pi^- X$
$2.62 \pm 0.15 \pm 0.14$	0.3k	¹ METREVELI	12	$\psi(2S) \rightarrow \pi^+ \pi^- K_S^0 K_L^0$
$1.82 \pm 0.04 \pm 0.13$	2.1k	² BAI	04A BES2	$J/\psi \rightarrow K_S^0 K_L^0 \rightarrow \pi^+ \pi^- X$

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

$1.18 \pm 0.12 \pm 0.18$		JOUSSET	90	DM2 $J/\psi \rightarrow$ hadrons
$1.01 \pm 0.16 \pm 0.09$	74	BALTRUSAIT...85D	MRK3	e^+e^-



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

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

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

Γ_{165}/Γ

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

Γ_{166}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$< 1.4 \times 10^{-8}$	95	¹ ABLIKIM	17AH BES3	$J/\psi \rightarrow K_S^0 K_S^0 \rightarrow \pi^+ \pi^- \pi^+ \pi^-$

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

$< 1 \times 10^{-6}$	95	¹ BAI	04D BES	e^+e^-
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$<5.2 \times 10^{-6}$ 90 ¹ BALTRUSAIT ..85C MRK3 e^+e^- ¹Forbidden by *CP*. $\Gamma(K\bar{K}\pi)/\Gamma_{\text{total}}$ Γ_{167}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
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	$e^+e^- \rightarrow K_S^0 K^\pm \pi^\mp$

 $\Gamma(K^+K^-\pi^0)/\Gamma_{\text{total}}$ Γ_{168}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
2.88 ± 0.01 ± 0.12	183k	ABLIKIM 19AQ	BES	$J/\psi \rightarrow K^+K^-\pi^0$

 $\Gamma(K^+K^-\pi^0)/\Gamma(\pi^+\pi^-\pi^0)$ $\Gamma_{168}/\Gamma_{151}$

VALUE (%)	EVTS	DOCUMENT ID	TECN	COMMENT
12.0 ± 0.3 ± 0.9	23k	LEES 17C	BABR	$J/\psi \rightarrow h^+h^-\pi^0$

 $\Gamma(K_S^0 K^\pm \pi^\mp)/\Gamma(\pi^+\pi^-\pi^0)$ $\Gamma_{169}/\Gamma_{151}$

VALUE (%)	EVTS	DOCUMENT ID	TECN	COMMENT
26.5 ± 0.5 ± 2.1	24k	LEES 17C	BABR	$J/\psi \rightarrow h^0 h^+ h^-$

 $\Gamma(K^+K^-\pi^+\pi^-)/\Gamma_{\text{total}}$ Γ_{173}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
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• • • We do not use the following data for averages, fits, limits, etc. • • •

7.2 ± 2.3 205 VANNUCCI 77 MRK1 e^+e^- $\Gamma(K^+K^-\pi^+\pi^-)/\Gamma_{\text{total}}$ Γ_{180}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
31 ± 13	30	VANNUCCI 77	MRK1	e^+e^-

 $\Gamma(2(K^+K^-))/\Gamma_{\text{total}}$ Γ_{182}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
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• • • We do not use the following data for averages, fits, limits, etc. • • •

1.4^{+0.5}_{-0.4} ± 0.2 11.0^{+4.3}_{-3.5} ¹ HUANG 03 BELL $B^+ \rightarrow 2(K^+K^-) K^+$ 0.7 ± 0.3 VANNUCCI 77 MRK1 e^+e^- ¹Using $B(B^+ \rightarrow J/\psi K^+) = (1.01 \pm 0.05) \times 10^{-3}$. $\Gamma(p\bar{p})/\Gamma_{\text{total}}$ Γ_{184}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
2.120 ± 0.029 OUR AVERAGE				
2.112 ± 0.004 ± 0.031	314k	ABLIKIM 12C	BES3	e^+e^-
2.17 ± 0.16 ± 0.04	317	¹ WU 06	BELL	$B^+ \rightarrow p\bar{p}K^+$
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^-

¹WU 06 reports $[\Gamma(J/\psi(1S) \rightarrow p\bar{p})/\Gamma_{\text{total}}] \times [B(B^+ \rightarrow J/\psi(1S)K^+)] = (2.21 \pm 0.13 \pm 0.10) \times 10^{-6}$ which we divide by our best value $B(B^+ \rightarrow J/\psi(1S)K^+) = (1.020 \pm 0.019) \times 10^{-3}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

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

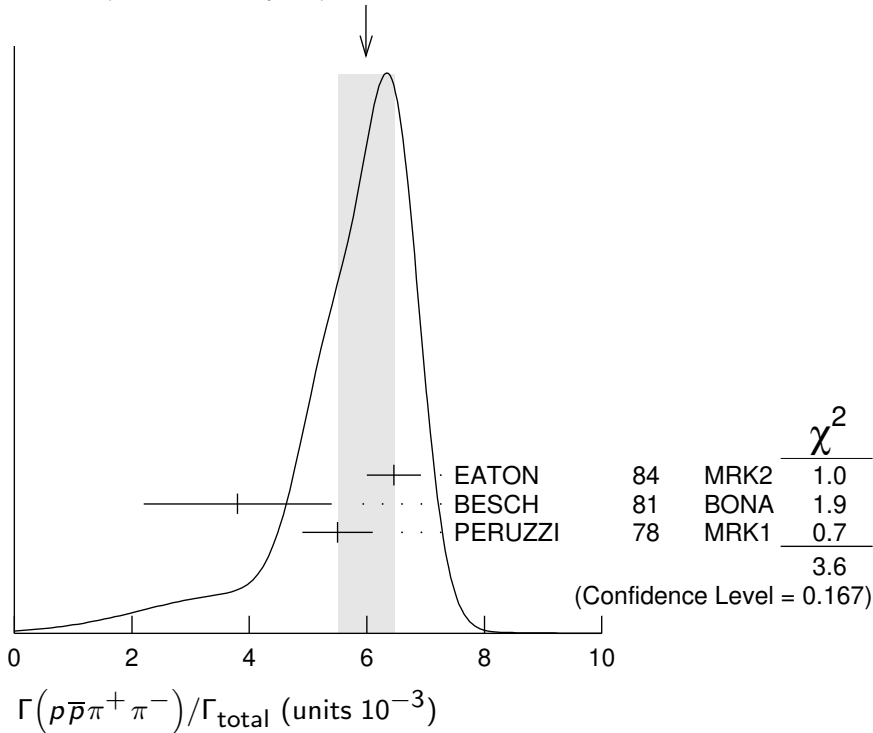
$\Gamma(p\bar{p}\pi^0)/\Gamma_{\text{total}}$ Γ_{185}/Γ

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

$\Gamma(p\bar{p}\pi^+\pi^-)/\Gamma_{\text{total}}$ Γ_{186}/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)



$\Gamma(p\bar{p}\pi^+\pi^-\pi^0)/\Gamma_{\text{total}}$ Γ_{187}/Γ

Including $p\bar{p}\pi^+\pi^-\gamma$ 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.		
$3.36 \pm 0.65 \pm 0.28$	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_{188}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
2.00 ± 0.12 OUR AVERAGE				
$1.91 \pm 0.02 \pm 0.17$	13k	¹ ABLIKIM	09	BES2 e^+e^-
$2.03 \pm 0.13 \pm 0.15$	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.

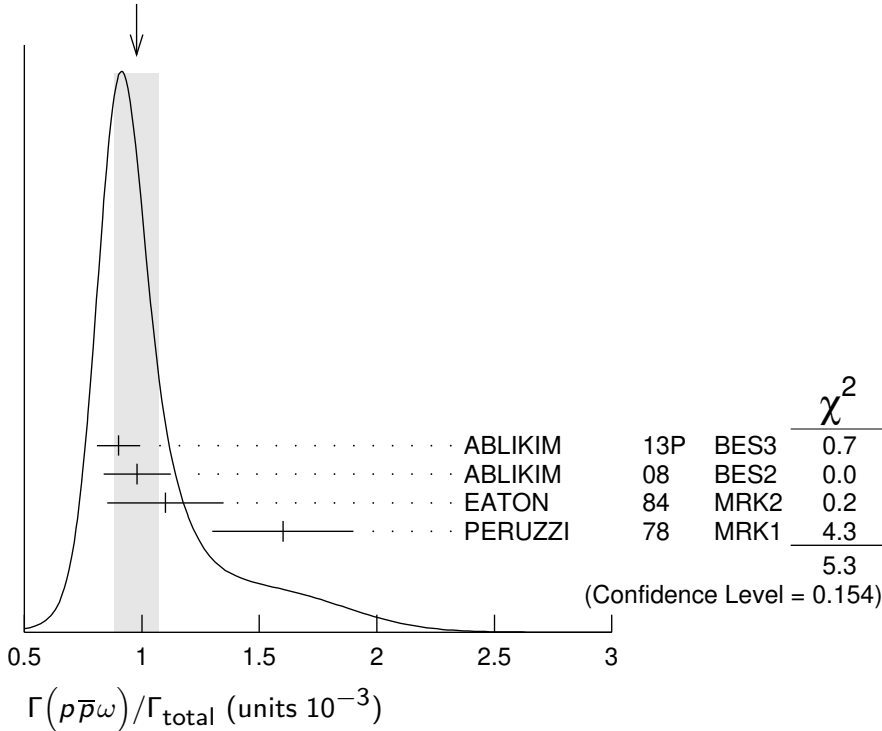
$\Gamma(p\bar{p}\rho)/\Gamma_{\text{total}}$ Γ_{189}/Γ

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

$\Gamma(p\bar{p}\omega)/\Gamma_{\text{total}}$ Γ_{190}/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.		
$0.90 \pm 0.02 \pm 0.09$	2670	ABLIKIM	13P	BES3 e^+e^-
$0.98 \pm 0.03 \pm 0.14$	2449	ABLIKIM	08	BES2 e^+e^-
$1.10 \pm 0.17 \pm 0.18$	486	EATON	84	MRK2 e^+e^-
1.6 ± 0.3	77	PERUZZI	78	MRK1 e^+e^-

WEIGHTED AVERAGE
 0.98 ± 0.10 (Error scaled by 1.3)



$\Gamma(p\bar{p}\eta'(958))/\Gamma_{\text{total}}$ Γ_{191}/Γ

<u>VALUE (units 10^{-3})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.129±0.014 OUR AVERAGE				Error includes scale factor of 2.0.
0.126±0.002±0.007	16k	¹ ABLIKIM	19N BES3	e^+e^-
0.200±0.023±0.028	265 ± 31	² 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^-

¹ From the combination of $p\bar{p}\eta' \rightarrow p\bar{p}\pi^+\pi^-\eta$ and $p\bar{p}\eta' \rightarrow p\bar{p}\pi^+\pi^-\gamma$ channels.² From 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. $\Gamma(p\bar{p}a_0(980) \rightarrow p\bar{p}\pi^0\eta)/\Gamma_{\text{total}}$ Γ_{192}/Γ

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

 $\Gamma(p\bar{p}\phi)/\Gamma_{\text{total}}$ Γ_{193}/Γ

<u>VALUE (units 10^{-4})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.519±0.033 OUR AVERAGE				
0.523±0.006±0.033	14k	ABLIKIM 16K	BES3	$J/\psi \rightarrow p\bar{p}K_S^0 K_L^0,$ $p\bar{p}K^+ K^-$
0.45 ±0.13 ±0.07		FALVARD 88	DM2	$J/\psi \rightarrow \text{hadrons}$

 $\Gamma(p\bar{n}\pi^-)/\Gamma_{\text{total}}$ Γ_{194}/Γ

<u>VALUE (units 10^{-3})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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	$e^+e^- \rightarrow \bar{p}\pi^+$

 $\Gamma(n\bar{n})/\Gamma_{\text{total}}$ Γ_{195}/Γ

<u>VALUE (units 10^{-3})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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. ● ● ●

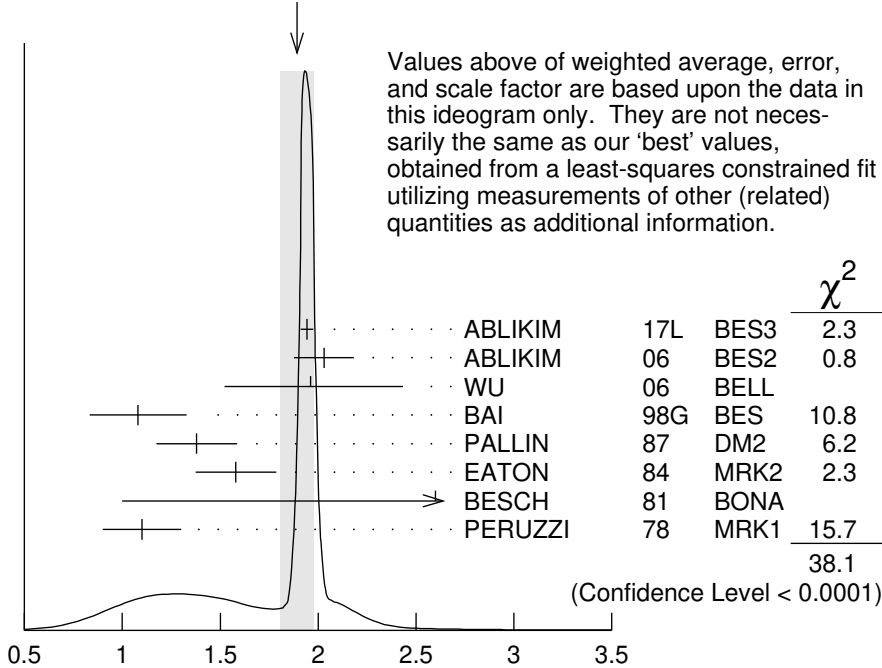
1.90±0.55	40	ANTONELLI 93	SPEC	e^+e^-
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 $\Gamma(n\bar{n}\pi^+\pi^-)/\Gamma_{\text{total}}$ Γ_{196}/Γ

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

$\Gamma(\Lambda\bar{\Lambda})/\Gamma_{\text{total}}$			Γ_{200}/Γ		
VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT	
1.89 ± 0.09	OUR AVERAGE	Error includes scale factor of 2.8.		See the ideogram below.	
1.943 ± 0.003 ± 0.033	441k	ABLIKIM	17L	BES3	e^+e^-
2.03 ± 0.03 ± 0.15	8887	ABLIKIM	06	BES2	$J/\psi \rightarrow \Lambda\bar{\Lambda}$
1.96 $^{+0.47}_{-0.44}$ ± 0.04	46	¹ 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^-

WEIGHTED AVERAGE
1.89±0.09 (Error scaled by 2.8)



¹WU 06 reports $[\Gamma(J/\psi(1S) \rightarrow \Lambda\bar{\Lambda})/\Gamma_{\text{total}}] \times [B(B^+ \rightarrow J/\psi(1S)K^+)] = (2.00^{+0.34}_{-0.29} \pm 0.34) \times 10^{-6}$ which we divide by our best value $B(B^+ \rightarrow J/\psi(1S)K^+) = (1.020 \pm 0.019) \times 10^{-3}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\Lambda\bar{\Lambda})/\Gamma_{\text{total}}$ (units 10^{-3})

$\Gamma(\Lambda\bar{\Lambda}\pi^0)/\Gamma_{\text{total}}$			Γ_{201}/Γ		
VALUE (units 10^{-5})	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
3.78 ± 0.27 ± 0.30		323	¹ 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. ● ● ●					
< 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 $B(\Lambda \rightarrow \pi^- p) = 63.9\%$.					

$\Gamma(\Lambda\bar{\Lambda}\pi^+\pi^-)/\Gamma_{\text{total}}$ Γ_{202}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
4.30±0.13±0.99	2.4k	ABLIKIM	12P BES2	J/ψ

 $\Gamma(\Lambda\bar{\Lambda}\eta)/\Gamma_{\text{total}}$ Γ_{203}/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 $B(\eta \rightarrow \gamma\gamma) = 39.4\%$. $\Gamma(\Lambda\bar{\Sigma}^-\pi^+(\text{or c.c.}))/\Gamma_{\text{total}}$ Γ_{204}/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±0.051±0.083	335	¹ ABLIKIM	07H BES2	$e^+e^- \rightarrow \bar{\Lambda}\Sigma^+\pi^-$
0.747±0.056±0.076	254	¹ ABLIKIM	07H BES2	$e^+e^- \rightarrow \Lambda\bar{\Sigma}^-\pi^+$
0.90 ±0.06 ±0.16	225 ± 15	HENRARD	87 DM2	$e^+e^- \rightarrow \bar{\Lambda}\Sigma^+\pi^-$
1.11 ±0.06 ±0.20	342 ± 18	HENRARD	87 DM2	$e^+e^- \rightarrow \Lambda\bar{\Sigma}^-\pi^+$
1.53 ±0.17 ±0.38	135	EATON	84 MRK2	$e^+e^- \rightarrow \bar{\Lambda}\Sigma^+\pi^-$
1.38 ±0.21 ±0.35	118	EATON	84 MRK2	$e^+e^- \rightarrow \Lambda\bar{\Sigma}^-\pi^+$

¹ Using $B(\Lambda \rightarrow \pi^- p) = 63.9\%$ and $B(\Sigma^+ \rightarrow \pi^0 p) = 51.6\%$. $\Gamma(pK^-\bar{\Lambda}+\text{c.c.})/\Gamma_{\text{total}}$ Γ_{205}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
0.86±0.11 OUR AVERAGE				
0.84 ^{+0.17} _{-0.15} ±0.02	45	¹ LU	19 BELL	$B^+ \rightarrow \bar{p}\Lambda K^+ K^+$
0.89±0.07±0.14	307	EATON	84 MRK2	e^+e^-

¹ LU 19 reports $(8.32^{+1.63}_{-1.45} \pm 0.49) \times 10^{-4}$ from a measurement of $[\Gamma(J/\psi(1S) \rightarrow pK^-\bar{\Lambda}+\text{c.c.})/\Gamma_{\text{total}}] \times [B(B^+ \rightarrow J/\psi(1S)K^+)]$ assuming $B(B^+ \rightarrow J/\psi(1S)K^+) = (1.026 \pm 0.031) \times 10^{-3}$, which we rescale to our best value $B(B^+ \rightarrow J/\psi(1S)K^+) = (1.020 \pm 0.019) \times 10^{-3}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

 $\Gamma(pK^-\bar{\Sigma}^0)/\Gamma_{\text{total}}$ Γ_{206}/Γ

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

 $\Gamma(\bar{\Lambda}nK_S^0+\text{c.c.})/\Gamma_{\text{total}}$ Γ_{207}/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 $B(K_S^0 \rightarrow \pi^+\pi^-) = 69.2\%$. $\Gamma(\Lambda\bar{\Sigma}^+\text{c.c.})/\Gamma_{\text{total}}$ Γ_{208}/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. • • •
 <18 ² HENRARD 87 DM2 $J/\psi \rightarrow \bar{\Lambda}\Sigma^0$
 <15 90 PERUZZI 78 MRK1 $e^+e^- \rightarrow \Lambda X$

¹ ABLIKIM 12B quotes $B(J/\psi \rightarrow \Lambda\bar{\Sigma}^0)$ which we multiply by 2.

² ABLIKIM 12B and HENRARD 87 quote results for $B(J/\psi \rightarrow \bar{\Lambda}\Sigma^0)$ which we multiply by 2.

$\Gamma(\Sigma^+\bar{\Sigma}^-)/\Gamma_{\text{total}}$ Γ_{209}/Γ

<u>VALUE (units 10⁻³)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
1.07 ± 0.04 OUR AVERAGE				
1.061 ± 0.004 ± 0.036	87k	ABLIKIM	21AT BES3	$J/\psi \rightarrow p\pi^0\bar{p}\pi^0$
1.50 ± 0.10 ± 0.22	399	ABLIKIM	080 BES2	$e^+e^- \rightarrow J/\psi$

$\Gamma(\Sigma^0\bar{\Sigma}^0)/\Gamma_{\text{total}}$ Γ_{210}/Γ

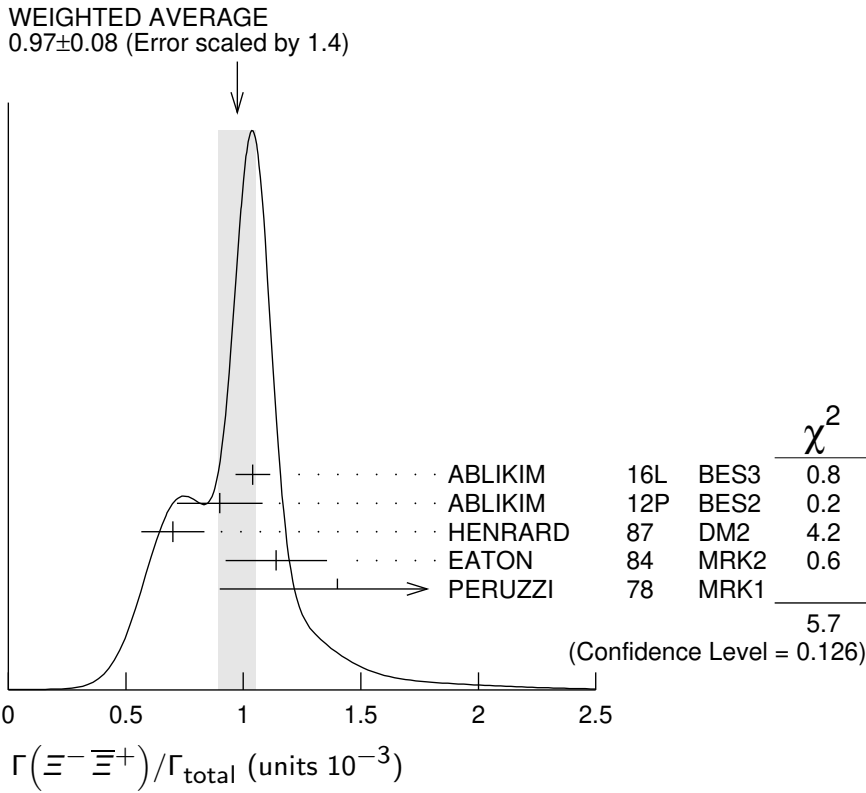
<u>VALUE (units 10⁻³)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
1.172 ± 0.032 OUR AVERAGE				Error includes scale factor of 1.4.
1.164 ± 0.004 ± 0.023	111k	ABLIKIM	17L BES3	$J/\psi \rightarrow \Sigma^0\bar{\Sigma}^0$
1.33 ± 0.04 ± 0.11	1.7k	ABLIKIM	06 BES2	$J/\psi \rightarrow \Sigma^0\bar{\Sigma}^0$
1.06 ± 0.04 ± 0.23	884	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 $e^+e^- \rightarrow \Sigma^+\bar{\Sigma}^-$

$\Gamma(\Xi^-\bar{\Xi}^+)/\Gamma_{\text{total}}$ Γ_{211}/Γ

<u>VALUE (units 10⁻³)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.97 ± 0.08 OUR AVERAGE				Error includes scale factor of 1.4. See the ideogram below.
1.040 ± 0.006 ± 0.074	43k	ABLIKIM	16L BES3	$J/\psi \rightarrow \Xi^-\bar{\Xi}^+$
0.90 ± 0.03 ± 0.18	961	ABLIKIM	12P BES2	$J/\psi \rightarrow \Xi^-\bar{\Xi}^+$
0.70 ± 0.06 ± 0.12	132	HENRARD	87 DM2	$e^+e^- \rightarrow \Xi^-\bar{\Xi}^+$
1.14 ± 0.08 ± 0.20	194	EATON	84 MRK2	$e^+e^- \rightarrow \Xi^-\bar{\Xi}^+$
1.4 ± 0.5	51	PERUZZI	78 MRK1	$e^+e^- \rightarrow \Xi^-\bar{\Xi}^+$



RADIATIVE DECAYS

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

Γ_{212}/Γ

VALUE (units 10^{-2})	EVTS	DOCUMENT ID	TECN	COMMENT
1.7 ± 0.4 OUR AVERAGE		Error includes scale factor of 1.5.		
$2.00 \pm 0.31 \pm 0.02$		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. ● ● ●				
seen		ANASHIN	14 KEDR	$J/\psi \rightarrow \gamma\eta_c$
0.79 ± 0.20	273 ± 43	² AUBERT	06E BABR	$B^\pm \rightarrow K^\pm X_{c\bar{c}}$
seen	16	BALTRUSAITIS	84 MRK3	$J/\psi \rightarrow 2\phi\gamma$

¹ MITCHELL 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 $B(\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-) = (34.68 \pm 0.30) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

² Calculated 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_{213}/Γ

VALUE (units 10^{-6})	EVTS	DOCUMENT ID	TECN	COMMENT
$3.8^{+1.3}_{-1.0}$ 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	$\psi(2S) \rightarrow \pi^+\pi^- J/\psi$

$\Gamma(\gamma\eta_c(1S) \rightarrow \gamma\eta\eta\eta')/\Gamma_{\text{total}}$ Γ_{214}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT
4.86 ± 0.62 ± 0.45	137	ABLIKIM	21C	BES3 $J/\psi(1S) \rightarrow \gamma\eta\eta\eta'$

$\Gamma(3\gamma)/\Gamma_{\text{total}}$ Γ_{215}/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^-
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$\Gamma(4\gamma)/\Gamma_{\text{total}}$ Γ_{216}/Γ

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

$\Gamma(5\gamma)/\Gamma_{\text{total}}$ Γ_{217}/Γ

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

$\Gamma(\gamma\pi^0)/\Gamma_{\text{total}}$ Γ_{218}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT
3.56 ± 0.17 OUR AVERAGE				
3.59 ± 0.20 ± 0.03	1.6k	¹ ABLIKIM	180	BES3 $\psi(2S) \rightarrow \pi^+\pi^- \gamma\gamma\gamma$
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^-

¹ ABLIKIM 180 reports $[\Gamma(J/\psi(1S) \rightarrow \gamma\pi^0)/\Gamma_{\text{total}}] \times [B(\pi^0 \rightarrow 2\gamma)] = (3.57 \pm 0.12 \pm 0.16) \times 10^{-5}$ from a measurement of $[\Gamma(J/\psi(1S) \rightarrow \gamma\pi^0)/\Gamma_{\text{total}}] \times [B(\pi^0 \rightarrow 2\gamma)] \times [B(\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-)]$ assuming $B(\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-) = (34.49 \pm 0.30) \times 10^{-2}$, which we rescale to our best values $B(\pi^0 \rightarrow 2\gamma) = (98.823 \pm 0.034) \times 10^{-2}$, $B(\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-) = (34.68 \pm 0.30) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best values.

$\Gamma(\gamma\pi^0\pi^0)/\Gamma_{\text{total}}$ Γ_{219}/Γ

VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
1.15 ± 0.05	¹ ABLIKIM	15AE	BES3 $J/\psi \rightarrow \gamma\pi^0\pi^0$

¹ The uncertainty is systematic as statistical is negligible.

$\Gamma(\gamma 2\pi^+ 2\pi^-)/\Gamma_{\text{total}}$ Γ_{220}/Γ

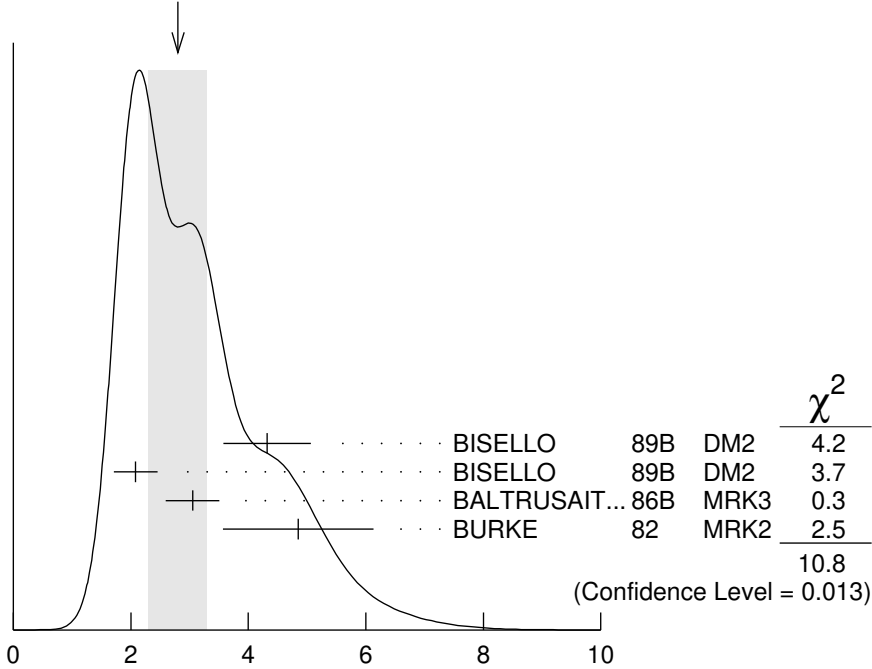
VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
2.8 ± 0.5 OUR AVERAGE	Error includes scale factor of 1.9. See the ideogram below.		
4.32 ± 0.14 ± 0.73	¹ BISELLO	89B	DM2 $J/\psi \rightarrow 4\pi\gamma$
2.08 ± 0.13 ± 0.35	² BISELLO	89B	DM2 $J/\psi \rightarrow 4\pi\gamma$
3.05 ± 0.08 ± 0.45	² BALTRUSAIT..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

4.85±0.45±1.20

³ BURKE

82 MRK2 e⁺e⁻

WEIGHTED AVERAGE
2.8±0.5 (Error scaled by 1.9)



¹ 4 π mass less than 3.0 GeV.
² 4 π mass less than 2.0 GeV.
³ 4 π mass less than 2.5 GeV.
 $\Gamma(\gamma 2\pi^+ 2\pi^-)/\Gamma_{\text{total}}$ (units 10⁻³)

$\Gamma(\gamma f_2(1270) f_2(1270))/\Gamma_{\text{total}}$				Γ_{221}/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_{222}/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.

$\Gamma(\gamma \pi^+ \pi^- 2\pi^0)/\Gamma_{\text{total}}$				Γ_{223}/Γ
VALUE (units 10 ⁻³)	DOCUMENT ID	TECN	COMMENT	
8.3±0.2±3.1	¹ BALTRUSAIT...86B	MRK3	$J/\psi \rightarrow 4\pi\gamma$	

¹ 4 π mass less than 2.0 GeV.

$\Gamma(\gamma K_S^0 K_S^0)/\Gamma_{\text{total}}$				Γ_{224}/Γ
VALUE (units 10 ⁻⁴)	DOCUMENT ID	TECN	COMMENT	
8.1±0.4	ABLIKIM	18AA BES3	$J/\psi \rightarrow \gamma K_S^0 K_S^0$	

$\Gamma(\gamma(K\bar{K}\pi)[J^{PC}=0^{-+}])/\Gamma_{\text{total}}$ Γ_{225}/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. $\Gamma(\gamma K^+ K^- \pi^+ \pi^-)/\Gamma_{\text{total}}$ Γ_{226}/Γ

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

 $\Gamma(\gamma K^*(892)\bar{K}^*(892))/\Gamma_{\text{total}}$ Γ_{227}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
4.0 ± 0.3 ± 1.3	320	¹ BAI	00B BES	$J/\psi \rightarrow \gamma K^+ K^0 \pi^+ \pi^-$

¹ Summed over all charges. $\Gamma(\gamma\eta)/\Gamma_{\text{total}}$ Γ_{228}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
1.085 ± 0.018 OUR AVERAGE				
1.067 ± 0.005 ± 0.023	87.9k	ABLIKIM	21AMBES3	$e^+ e^- \rightarrow J/\psi$
1.12 ± 0.05 ± 0.01	18.6k	¹ ABLIKIM	180 BES3	$\psi(2S) \rightarrow \pi^+ \pi^- \gamma \gamma$
1.101 ± 0.029 ± 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 ± 0.08 ± 0.11		BLOOM	83 CBAL	$e^+ e^-$
0.82 ± 0.10		BRANDELIK	79c DASP	$e^+ e^-$
1.3 ± 0.4	21	BARTEL	77 CNTR	$e^+ e^-$

¹ ABLIKIM 180 reports $[\Gamma(J/\psi(1S) \rightarrow \gamma\eta)/\Gamma_{\text{total}}] \times [B(\eta \rightarrow 2\gamma)] = (4.42 \pm 0.04 \pm 0.18) \times 10^{-4}$ from a measurement of $[\Gamma(J/\psi(1S) \rightarrow \gamma\eta)/\Gamma_{\text{total}}] \times [B(\eta \rightarrow 2\gamma)] \times [B(\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-)]$ assuming $B(\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-) = (34.49 \pm 0.30) \times 10^{-2}$, which we rescale to our best values $B(\eta \rightarrow 2\gamma) = (39.36 \pm 0.18) \times 10^{-2}$, $B(\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-) = (34.68 \pm 0.30) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best values.

 $\Gamma(\gamma\eta\pi^0)/\Gamma_{\text{total}}$ Γ_{229}/Γ

VALUE (units 10^{-6})	EVTS	DOCUMENT ID	TECN	COMMENT
21.4 ± 1.8 ± 2.5	596	ABLIKIM	16P BES3	$J/\psi \rightarrow 5\gamma$

 $\Gamma(\gamma a_0(980)^0 \rightarrow \gamma\eta\pi^0)/\Gamma_{\text{total}}$ Γ_{233}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
< 2.5 × 10⁻⁶	95	ABLIKIM	16P BES3	$J/\psi \rightarrow 5\gamma$

 $\Gamma(\gamma a_2(1320)^0 \rightarrow \gamma\eta\pi^0)/\Gamma_{\text{total}}$ Γ_{234}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
< 6.6 × 10⁻⁶	95	ABLIKIM	16P BES3	$J/\psi \rightarrow 5\gamma$

$\Gamma(\gamma\eta\pi\pi)/\Gamma_{\text{total}}$ Γ_{235}/Γ

VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
6.1 ± 1.0 OUR AVERAGE			
5.85 ± 0.3 ± 1.05	¹ EDWARDS	83B	CBAL $J/\psi \rightarrow \eta\pi^+\pi^-$
7.8 ± 1.2 ± 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_{236}/Γ

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

 $\Gamma(\gamma\eta'(958))/\Gamma_{\text{total}}$ Γ_{237}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
5.25 ± 0.07 OUR AVERAGE				Error includes scale factor of 1.3. See the ideogram below.
5.27 ± 0.03 ± 0.05	36k	ABLIKIM	19T	BES $J/\psi \rightarrow \gamma\eta'$
5.43 ± 0.23 ± 0.09	5.0k	¹ ABLIKIM	180	BES3 $\psi(2S) \rightarrow \pi^+\pi^-\gamma\gamma$
4.77 ± 0.22 ± 0.06		² 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 $J/\psi \rightarrow \eta'\gamma$

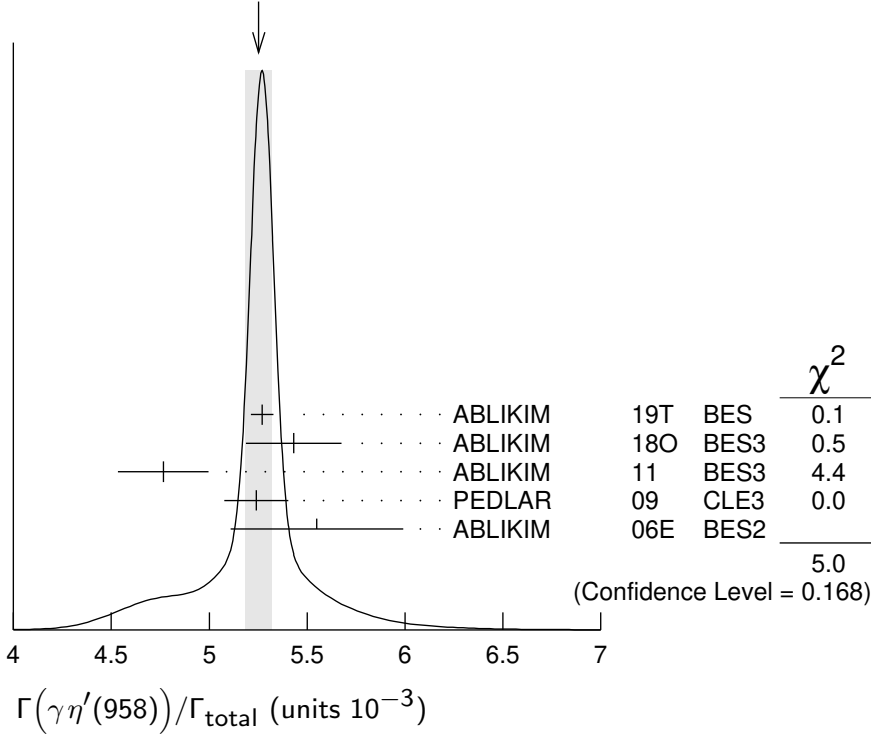
• • • We do not use the following data for averages, fits, limits, etc. • • •

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 180 reports $[\Gamma(J/\psi(1S) \rightarrow \gamma\eta'(958))/\Gamma_{\text{total}}] \times [B(\eta'(958) \rightarrow \gamma\gamma)] = (1.26 \pm 0.02 \pm 0.05) \times 10^{-4}$ from a measurement of $[\Gamma(J/\psi(1S) \rightarrow \gamma\eta'(958))/\Gamma_{\text{total}}] \times [B(\eta'(958) \rightarrow \gamma\gamma)] \times [B(\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-)]$ assuming $B(\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-) = (34.49 \pm 0.30) \times 10^{-2}$, which we rescale to our best values $B(\eta'(958) \rightarrow \gamma\gamma) = (2.307 \pm 0.033) \times 10^{-2}$, $B(\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-) = (34.68 \pm 0.30) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best values.

² 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 $B(\eta'(958) \rightarrow \pi^+\pi^-\eta) = (42.5 \pm 0.5) \times 10^{-2}$, $B(\eta \rightarrow 2\gamma) = (39.36 \pm 0.18) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best values.

WEIGHTED AVERAGE
 5.25 ± 0.07 (Error scaled by 1.3)



$\Gamma(\gamma f_0(500) \rightarrow \gamma \pi \pi)/\Gamma_{\text{total}}$ Γ_{230}/Γ

VALUE (units 10^{-4})	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
10.5 ± 2.0	SARANTSEV 21	RVUE	$J/\psi(1S) \rightarrow \gamma(\pi\pi, K\bar{K}, \eta\eta, \omega\phi)$

$\Gamma(\gamma f_0(500) \rightarrow \gamma K \bar{K})/\Gamma_{\text{total}}$ Γ_{231}/Γ

VALUE (units 10^{-5})	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
5 ± 5	SARANTSEV 21	RVUE	$J/\psi(1S) \rightarrow \gamma(\pi\pi, K\bar{K}, \eta\eta, \omega\phi)$

$\Gamma(\gamma f_0(500) \rightarrow \gamma \eta \eta)/\Gamma_{\text{total}}$ Γ_{232}/Γ

VALUE (units 10^{-5})	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
4 ± 3	SARANTSEV 21	RVUE	$J/\psi(1S) \rightarrow \gamma(\pi\pi, K\bar{K}, \eta\eta, \omega\phi)$

$\Gamma(\gamma f_0(980) \rightarrow \gamma \pi \pi)/\Gamma_{\text{total}}$ Γ_{238}/Γ

VALUE (units 10^{-5})	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
1.3 ± 0.2	SARANTSEV 21	RVUE	$J/\psi(1S) \rightarrow \gamma(\pi\pi, K\bar{K}, \eta\eta, \omega\phi)$

$\Gamma(\gamma f_0(980) \rightarrow \gamma K \bar{K})/\Gamma_{\text{total}}$ Γ_{239}/Γ

VALUE (units 10^{-5})	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.8 ± 0.3	SARANTSEV 21	RVUE	$J/\psi(1S) \rightarrow \gamma(\pi\pi, K\bar{K}, \eta\eta, \omega\phi)$

$\Gamma(\gamma\rho\rho)/\Gamma_{\text{total}}$ Γ_{240}/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_{241}/Γ

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

$\Gamma(\gamma\rho\phi)/\Gamma_{\text{total}}$ Γ_{242}/Γ

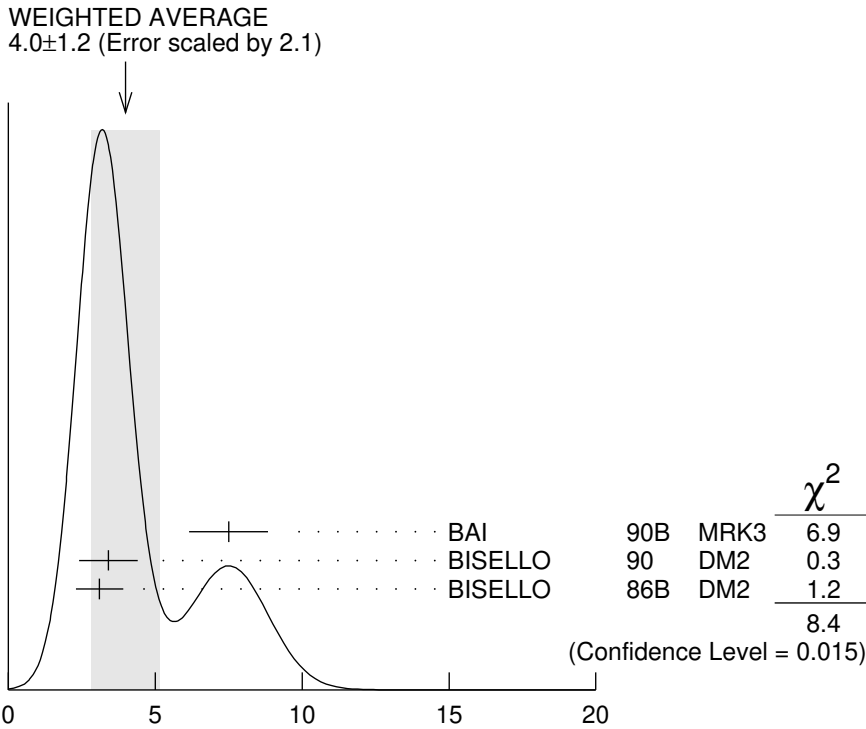
<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<8.8 × 10⁻⁵	90	ABLIKIM	08A	BES2 $e^+e^- \rightarrow J/\psi$

$\Gamma(\gamma\omega\omega)/\Gamma_{\text{total}}$ Γ_{243}/Γ

<u>VALUE (units 10^{-3})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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

$\Gamma(\gamma\phi\phi)/\Gamma_{\text{total}}$ Γ_{244}/Γ

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

$\Gamma(\gamma\eta(1405/1475) \rightarrow \gamma K \bar{K} \pi)/\Gamma_{\text{total}}$ Γ_{245}/Γ

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

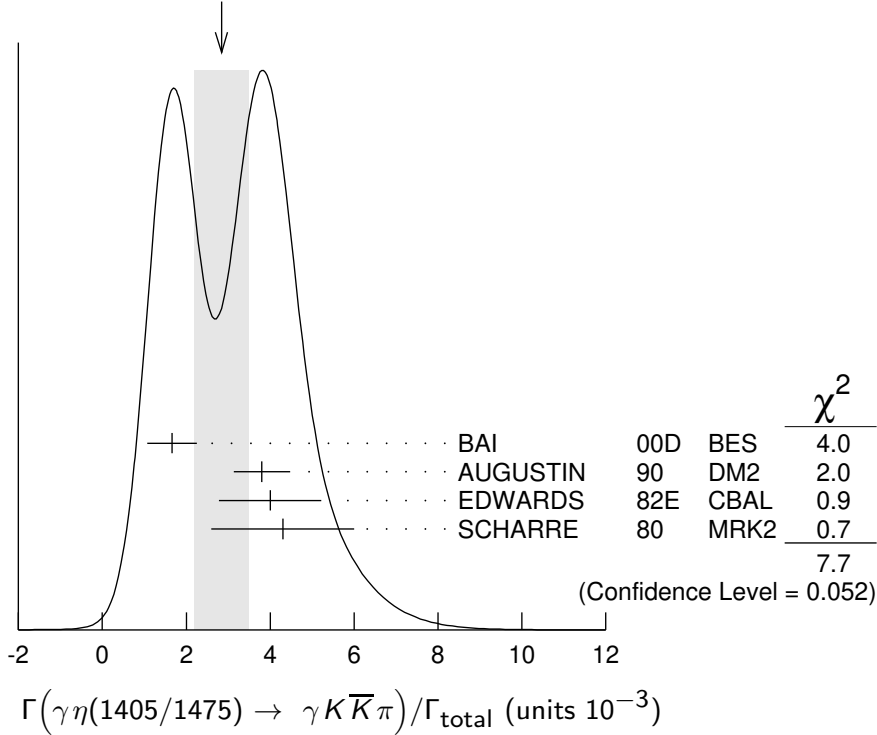
⁷ From fit to the $K^*(892) K 0^-+$ partial wave.

⁸ $K^* K$ mode.

⁹ From $a_0(980) \pi$ final state.

¹⁰ From $K^*(890) K$ final state.

WEIGHTED AVERAGE
 2.8 ± 0.6 (Error scaled by 1.6)



$\Gamma(\gamma\eta(1405/1475) \rightarrow \gamma\gamma\rho^0) / \Gamma_{\text{total}}$ Γ_{246} / Γ

VALUE (units 10^{-4})	DOCUMENT ID	TECN	COMMENT
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_{247} / Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
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 $\eta\pi^+\pi^-$.

$\Gamma(\gamma\eta(1405/1475) \rightarrow \gamma\rho^0\rho^0) / \Gamma_{\text{total}}$ Γ_{248} / 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 $\rho^0\rho^0$.

$\Gamma(\gamma\eta(1405/1475) \rightarrow \gamma\gamma\phi)/\Gamma_{\text{total}}$ Γ_{249}/Γ

VALUE (units 10^{-6})	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
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<82	95		BAI	04J BES2	$J/\psi \rightarrow \gamma\gamma K^+ K^-$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

$7.03 \pm 0.92 \pm 0.91$	1.3k		¹ ABLIKIM	18I BES3	$J/\psi \rightarrow \gamma\gamma\phi(1020)$
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$10.36 \pm 1.51 \pm 1.54$	1.9k		² ABLIKIM	18I BES3	$J/\psi \rightarrow \gamma\gamma\phi(1020)$
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¹ Constructive interference between the $X(1835)$ and $\eta(1405)/\eta(1475)$ is assumed in a fit to the $\gamma\phi$ invariant mass.

² Destructive interference between the $X(1835)$ and $\eta(1405)/\eta(1475)$ is assumed in a fit to the $\gamma\phi$ invariant mass.

 $\Gamma(\gamma\eta(1405) \rightarrow \gamma\gamma\gamma)/\Gamma_{\text{total}}$ Γ_{250}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
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<2.63 $\times 10^{-6}$	90	ABLIKIM	18O BES3	$\psi(2S) \rightarrow \pi^+ \pi^- \gamma\gamma\gamma$
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 $\Gamma(\gamma\eta(1475) \rightarrow \gamma\gamma\gamma)/\Gamma_{\text{total}}$ Γ_{251}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
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<1.86 $\times 10^{-6}$	90	ABLIKIM	18O BES3	$\psi(2S) \rightarrow \pi^+ \pi^- \gamma\gamma\gamma$
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 $\Gamma(\gamma\eta(1760) \rightarrow \gamma\rho^0\rho^0)/\Gamma_{\text{total}}$ Γ_{252}/Γ

VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
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0.13 ± 0.09	^{1,2} BISELLO	89B DM2	$J/\psi \rightarrow 4\pi\gamma$
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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_{253}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
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1.98 $\pm 0.08 \pm 0.32$	1045	ABLIKIM	06H BES	$J/\psi \rightarrow \gamma\omega\omega$
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 $\Gamma(\gamma\eta(1760) \rightarrow \gamma\gamma\gamma)/\Gamma_{\text{total}}$ Γ_{254}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
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<4.80 $\times 10^{-6}$	90	ABLIKIM	18O BES3	$\psi(2S) \rightarrow \pi^+ \pi^- \gamma\gamma\gamma$
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 $\Gamma(\gamma\eta(2225))/\Gamma_{\text{total}}$ Γ_{255}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
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3.14^{+0.50}_{-0.19} OUR AVERAGE

$2.40 \pm 0.10^{+2.47}_{-0.18}$		^{1,2} ABLIKIM	16N BES3	$J/\psi \rightarrow \gamma K^+ K^- K^+ K^-$
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$4.4 \pm 0.4 \pm 0.8$	196	² ABLIKIM	08I BES	$J/\psi \rightarrow \gamma K^+ K^- K_S^0 K_L^0$
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$3.3 \pm 0.8 \pm 0.5$		² BAI	90B MRK3	$J/\psi \rightarrow \gamma K^+ K^- K^+ K^-$
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$2.7 \pm 0.6 \pm 0.6$		² BAI	90B MRK3	$J/\psi \rightarrow \gamma K^+ K^- K_S^0 K_L^0$
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$2.4^{+1.5}_{-1.0}$		^{3,4} BISELLO	89B DM2	$J/\psi \rightarrow 4\pi\gamma$
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¹ From a partial wave analysis of $J/\psi \rightarrow \gamma\phi\phi$ that also finds significant signals for for $\eta(2100)$, 0^-+ phase space, $f_0(2100)$, $f_2(2010)$, $f_2(2300)$, $f_2(2340)$, and a previously unseen 0^-+ state $X(2500)$ ($M = 2470^{+15+101}_{-19-23}$ MeV, $\Gamma = 230^{+64+56}_{-35-33}$ MeV).

² Includes unknown branching fraction to $\phi\phi$.

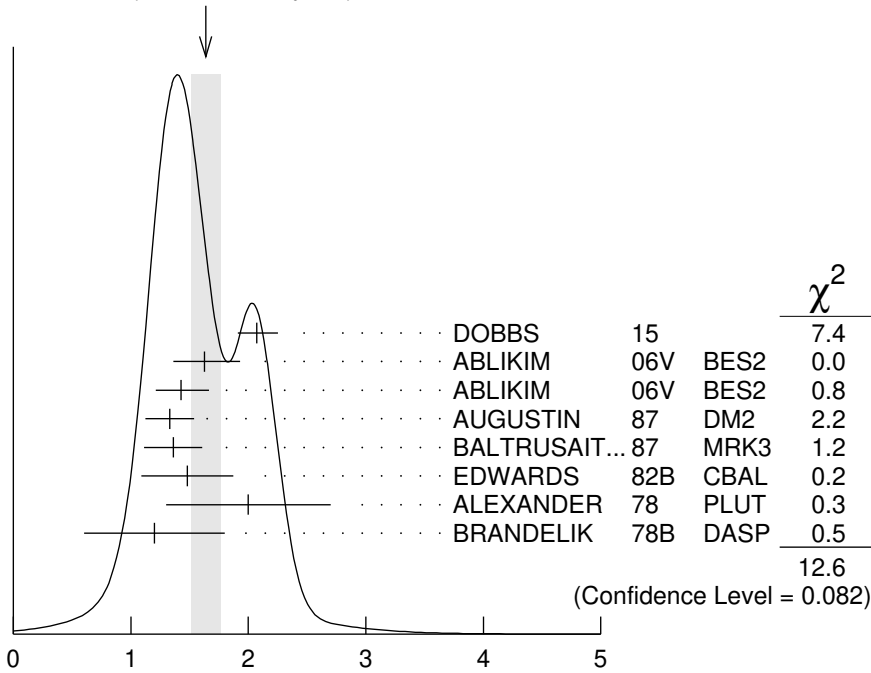
³ Estimated by us from various fits.

⁴ Includes unknown branching fraction to $\rho^0\rho^0$.

$\Gamma(\gamma f_2(1270))/\Gamma_{\text{total}}$ Γ_{256}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
1.64±0.12 OUR AVERAGE		Error includes scale factor of 1.3. See the ideogram below.		
2.07±0.16 ^{+0.02} _{-0.07}	2.4k	1,2 DOBBS	15	$J/\psi \rightarrow \gamma \pi \pi$
1.63±0.26 ^{+0.02} _{-0.06}		3 ABLIKIM	06V BES2	$e^+ e^- \rightarrow J/\psi \rightarrow \gamma \pi^+ \pi^-$
1.42±0.21 ^{+0.01} _{-0.05}		4 ABLIKIM	06V BES2	$e^+ e^- \rightarrow J/\psi \rightarrow \gamma \pi^0 \pi^0$
1.33±0.05±0.20		5 AUGUSTIN	87 DM2	$J/\psi \rightarrow \gamma \pi^+ \pi^-$
1.36±0.09±0.23		5 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	6 BRANDELIK	78B DASP	$e^+ e^- \rightarrow \pi^+ \pi^- \gamma$

WEIGHTED AVERAGE
1.64±0.12 (Error scaled by 1.3)



¹ Using CLEO-c data but not authored by the CLEO Collaboration.
² DOBBS 15 reports $[\Gamma(J/\psi(1S) \rightarrow \gamma f_2(1270))/\Gamma_{\text{total}}] \times [B(f_2(1270) \rightarrow \pi \pi)] = (1.744 \pm 0.052 \pm 0.122) \times 10^{-3}$ 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 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.
⁴ 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.

⁵ 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.

⁶ Restated by us to take account of spread of E1, M2, E3 transitions.

$\Gamma(\gamma f_2(1270))/\Gamma_{\text{total}}$ (units 10^{-3})

$\Gamma(\gamma f_2(1270) \rightarrow \gamma K_S^0 K_S^0)/\Gamma_{\text{total}}$ Γ_{257}/Γ

<u>VALUE (units 10^{-5})</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$2.58^{+0.08+0.59}_{-0.09-0.20}$	ABLIKIM	18AA BES3	$J/\psi \rightarrow \gamma K_S^0 K_S^0$

$\Gamma(\gamma f_1(1285))/\Gamma_{\text{total}}$ Γ_{258}/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 $\pm 0.16 \pm 0.20$	¹ BAI	04J BES2	$J/\psi \rightarrow \gamma\gamma\rho^0$
0.61 $\pm 0.04 \pm 0.21$	² BAI	00D BES	$J/\psi \rightarrow \gamma K^\pm K_S^0 \pi^\mp$
0.45 $\pm 0.09 \pm 0.17$	³ BAI	99 BES	$J/\psi \rightarrow \gamma\eta\pi^+\pi^-$
0.625 $\pm 0.063 \pm 0.103$	⁴ BOLTON	92 MRK3	$J/\psi \rightarrow \gamma f_1(1285)$
0.70 $\pm 0.08 \pm 0.16$	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 $a_0(980) \rightarrow \eta\pi$.

$\Gamma(\gamma f_0(1370) \rightarrow \gamma\pi\pi)/\Gamma_{\text{total}}$ Γ_{259}/Γ

<u>VALUE (units 10^{-5})</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
••• We do not use the following data for averages, fits, limits, etc. •••			
38 ± 10	SARANTSEV 21	RVUE	$J/\psi(1S) \rightarrow \gamma(\pi\pi, K\bar{K}, \eta\eta, \omega\phi)$

$\Gamma(\gamma f_0(1370) \rightarrow \gamma K\bar{K})/\Gamma_{\text{total}}$ Γ_{260}/Γ

<u>VALUE (units 10^{-4})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$4.19 \pm 0.73 \pm 1.34$	478	¹ DOBBS 15		$J/\psi \rightarrow \gamma K\bar{K}$
••• We do not use the following data for averages, fits, limits, etc. •••				
1.3 ± 0.4		SARANTSEV 21	RVUE	$J/\psi(1S) \rightarrow \gamma(\pi\pi, K\bar{K}, \eta\eta, \omega\phi)$

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

$\Gamma(\gamma f_0(1370) \rightarrow \gamma K_S^0 K_S^0)/\Gamma_{\text{total}}$ Γ_{261}/Γ

<u>VALUE (units 10^{-5})</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$1.07^{+0.08+0.36}_{-0.07-0.34}$	ABLIKIM	18AA BES3	$J/\psi \rightarrow \gamma K_S^0 K_S^0$

$\Gamma(\gamma f_0(1370) \rightarrow \gamma \eta \eta) / \Gamma_{\text{total}}$ Γ_{262} / Γ

VALUE (units 10^{-5})	DOCUMENT ID	TECN	COMMENT
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• • • We do not use the following data for averages, fits, limits, etc. • • •

3.5 ± 1.0	SARANTSEV	21	RVUE $J/\psi(1S) \rightarrow \gamma(\pi\pi, K\bar{K}, \eta\eta, \omega\phi)$
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 $\Gamma(\gamma f_0(1370) \rightarrow \gamma \eta \eta') / \Gamma_{\text{total}}$ Γ_{263} / Γ

VALUE (units 10^{-5})	DOCUMENT ID	TECN	COMMENT
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• • • We do not use the following data for averages, fits, limits, etc. • • •

0.9 ± 0.3	SARANTSEV	21	RVUE $J/\psi(1S) \rightarrow \gamma(\pi\pi, K\bar{K}, \eta\eta, \omega\phi)$
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 $\Gamma(\gamma f_1(1420) \rightarrow \gamma K \bar{K} \pi) / \Gamma_{\text{total}}$ Γ_{264} / Γ

VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
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0.79 ± 0.13 OUR AVERAGE

$0.68 \pm 0.04 \pm 0.24$	BAI	00D	BES $J/\psi \rightarrow \gamma K_S^0 \pi^\mp$
$0.76 \pm 0.15 \pm 0.21$	^{1,2} AUGUSTIN	92	DM2 $J/\psi \rightarrow \gamma K \bar{K} \pi$
$0.87 \pm 0.14^{+0.14}_{-0.11}$	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. $\Gamma(\gamma f_0(1500) \rightarrow \gamma \pi \pi) / \Gamma_{\text{total}}$ Γ_{265} / Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
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1.09 ± 0.24 OUR AVERAGE

$1.21 \pm 0.29 \pm 0.24$	174	¹ DOBBS	15	$J/\psi \rightarrow \gamma \pi \pi$
$1.00 \pm 0.03 \pm 0.45$		² ABLIKIM	06V	BES2 $e^+ e^- \rightarrow J/\psi \rightarrow \gamma \pi^+ \pi^-$
$1.02 \pm 0.09 \pm 0.45$		² 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. • • •

0.90 ± 0.17		SARANTSEV	21	RVUE $J/\psi(1S) \rightarrow \gamma(\pi\pi, K\bar{K}, \eta\eta, \omega\phi)$
5.7 ± 0.8	^{3,4}	BUGG	95	MRK3 $J/\psi \rightarrow \gamma \pi^+ \pi^- \pi^+ \pi^-$

¹ Using CLEO-c data but not authored by the CLEO Collaboration.² Including unknown branching fraction to $\pi\pi$.³ Including unknown branching ratio for $f_0(1500) \rightarrow \pi^+ \pi^- \pi^+ \pi^-$.⁴ 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_{266} / 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 $J/\psi \rightarrow \gamma \eta \eta$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

1.1 ± 0.4		SARANTSEV	21	RVUE $J/\psi(1S) \rightarrow \gamma(\pi\pi, K\bar{K}, \eta\eta, \omega\phi)$
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¹ From partial wave analysis including all possible combinations of 0^{++} , 2^{++} , and 4^{++} resonances. $\Gamma(\gamma f_0(1500) \rightarrow \gamma K_S^0 K_S^0) / \Gamma_{\text{total}}$ Γ_{267} / Γ

VALUE (units 10^{-5})	DOCUMENT ID	TECN	COMMENT
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$1.59 \pm 0.16^{+0.18}_{-0.56}$	ABLIKIM	18AA	BES3 $J/\psi \rightarrow \gamma K_S^0 K_S^0$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

0.7 ± 0.3 SARANTSEV 21 RVUE $J/\psi(1S) \rightarrow \gamma(\pi\pi, K\bar{K}, \eta\eta, \omega\phi)$

$\Gamma(\gamma f_0(1500) \rightarrow \gamma\eta\eta')/\Gamma_{\text{total}}$ **Γ_{268}/Γ**

VALUE (units 10 ⁻⁵)	DOCUMENT ID	TECN	COMMENT
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• • • We do not use the following data for averages, fits, limits, etc. • • •

1.2 ± 0.5 SARANTSEV 21 RVUE $J/\psi(1S) \rightarrow \gamma(\pi\pi, K\bar{K}, \eta\eta, \omega\phi)$

$\Gamma(\gamma f_1(1510) \rightarrow \gamma\eta\pi^+\pi^-)/\Gamma_{\text{total}}$ **Γ_{269}/Γ**

VALUE (units 10 ⁻⁴)	DOCUMENT ID	TECN	COMMENT
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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_{270}/Γ**

VALUE (units 10 ⁻⁴)	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
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5.7 ^{+0.8}/_{-0.5} OUR AVERAGE Error includes scale factor of 1.5. See the ideogram below.

8.1 ± 0.9 ± 0.2	750	1,2	DOBBS	15	$J/\psi \rightarrow \gamma K\bar{K}$
3.85 ± 0.17 ^{+1.91} / _{-0.73}		3	BAI	03G BES	$J/\psi \rightarrow \gamma K\bar{K}$
3.6 ± 0.4 ^{+1.4} / _{-0.4}		3	BAI	96C BES	$J/\psi \rightarrow \gamma K^+ K^-$
5.6 ± 1.4 ± 0.9		3	AUGUSTIN	88 DM2	$J/\psi \rightarrow \gamma K^+ K^-$
4.5 ± 0.4 ± 0.9		3	AUGUSTIN	88 DM2	$J/\psi \rightarrow \gamma K_S^0 K_S^0$
6.8 ± 1.6 ± 1.4		3	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 ⁴BRANDELIK 79C DASP $e^+e^- \rightarrow \pi^+\pi^-\gamma$
 <2.3 90 3 ALEXANDER 78 PLUT $e^+e^- \rightarrow K^+K^-\gamma$

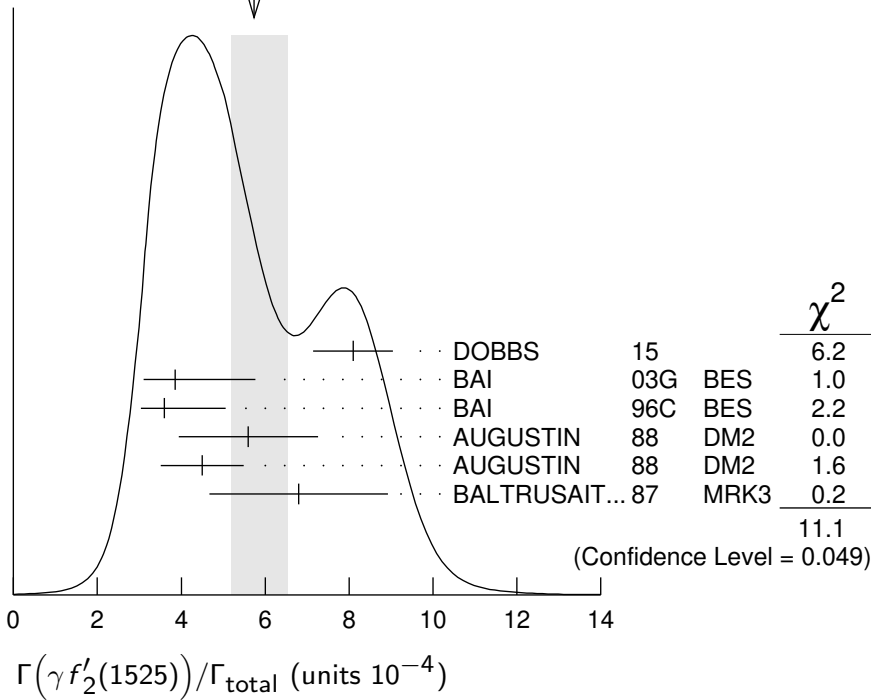
¹ Using CLEO-c data but not authored by the CLEO Collaboration.

² DOBBS 15 reports $[\Gamma(J/\psi(1S) \rightarrow \gamma f'_2(1525))/\Gamma_{\text{total}}] \times [B(f'_2(1525) \rightarrow K\bar{K})] = (7.09 \pm 0.46 \pm 0.67) \times 10^{-4}$ which we divide by our best value $B(f'_2(1525) \rightarrow K\bar{K}) = (87.6 \pm 2.2) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

³ Using $B(f'_2(1525) \rightarrow K\bar{K}) = 0.888$.

⁴ Assuming isotropic production and decay of the $f'_2(1525)$ and isospin.

WEIGHTED AVERAGE
5.7+0.8-0.5 (Error scaled by 1.5)



$\Gamma(\gamma f'_2(1525) \rightarrow \gamma K_S^0 K_S^0) / \Gamma_{\text{total}}$ Γ_{271} / Γ

VALUE (units 10^{-5})	DOCUMENT ID	TECN	COMMENT
$7.99^{+0.03+0.69}_{-0.04-0.50}$	ABLIKIM	18AA	BES3 $J/\psi \rightarrow \gamma K_S^0 K_S^0$

$\Gamma(\gamma f'_2(1525) \rightarrow \gamma \eta \eta) / \Gamma_{\text{total}}$ Γ_{272} / 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_{273} / Γ

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

$\Gamma(\gamma f_0(1710) \rightarrow \gamma \pi \pi) / \Gamma_{\text{total}}$ Γ_{274} / Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
3.8 ± 0.5 OUR AVERAGE				
$3.72 \pm 0.30 \pm 0.43$	483	¹ DOBBS	15	$J/\psi \rightarrow \gamma \pi \pi$
$3.96 \pm 0.06 \pm 1.12$		² ABLIKIM	06V	BES2 $e^+ e^- \rightarrow J/\psi \rightarrow \gamma \pi^+ \pi^-$
$3.99 \pm 0.15 \pm 2.64$		² 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. • • •				
0.6 ± 0.2		³ SARANTSEV	21	RVUE $J/\psi(1S) \rightarrow \gamma (\pi \pi, K \bar{K}, \eta \eta, \omega \phi)$

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

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

² Including unknown branching fraction to $\pi\pi$.

³ There is a further $(2.4 \pm 0.8) \times 10^{-4}$ scalar contribution at 1765 MeV.

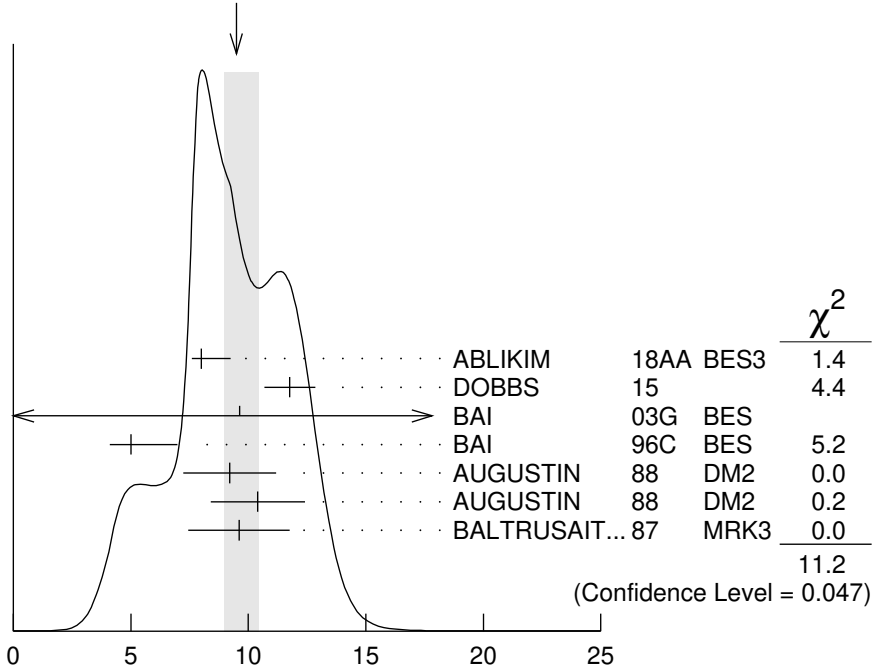
$\Gamma(\gamma f_0(1710) \rightarrow \gamma K \bar{K})/\Gamma_{\text{total}}$ Γ_{275}/Γ

VALUE (units 10^{-4}) CL% EVTS DOCUMENT ID TECN COMMENT

9.5 ± 1.0 ± 0.5 OUR AVERAGE Error includes scale factor of 1.5. See the ideogram below.

8.00 ⁺ ₋	0.12 ⁺ ₋	1.24 ⁺ ₋	0.08 ⁻ ₋	0.40 ⁻ ₋	1	ABLIKIM	18AA	BES3	$J/\psi \rightarrow \gamma K_S^0 K_S^0$
11.76 ±	0.54 ±	0.94	1.2k		2	DOBBS	15		$J/\psi \rightarrow \gamma K \bar{K}$
9.62 ±	0.29				3	BAI	03G	BES	$J/\psi \rightarrow \gamma K \bar{K}$
5.0 ±	0.8				1,4	BAI	96C	BES	$J/\psi \rightarrow \gamma K^+ K^-$
9.2 ±	1.4				1	AUGUSTIN	88	DM2	$J/\psi \rightarrow \gamma K^+ K^-$
10.4 ±	1.2				1	AUGUSTIN	88	DM2	$J/\psi \rightarrow \gamma K_S^0 K_S^0$
9.6 ±	1.2				1	BALTRUSAIT...87	MRK3		$J/\psi \rightarrow \gamma K^+ K^-$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●									
2.3 ±	0.8				5	SARANTSEV	21	RVUE	$J/\psi(1S) \rightarrow \gamma$ $(\pi\pi, K \bar{K}, \eta\eta, \omega\phi)$
1.6 ±	0.2				1,6	BAI	96C	BES	$J/\psi \rightarrow \gamma K^+ K^-$
< 0.8			90		7	BISELLO	89B		$J/\psi \rightarrow 4\pi\gamma$
1.6 ±	0.4				8	BALTRUSAIT...87	MRK3		$J/\psi \rightarrow \gamma \pi^+ \pi^-$
3.8 ±	1.6				9	EDWARDS	82D	CBAL	$e^+ e^- \rightarrow \eta\eta\gamma$

WEIGHTED AVERAGE
9.5+1.0-0.5 (Error scaled by 1.5)



¹ 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.

² Using CLEO-c data but not authored by the CLEO Collaboration.

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

⁴ Assuming $J^P = 2^+$ for $f_0(1710)$.

⁵ There is a further $(6 \pm 2) \times 10^{-4}$ scalar contribution at 1765 MeV.

⁶ Assuming $J^P = 0^+$ for $f_0(1710)$.

⁷ Includes unknown branching fraction to $\rho^0 \rho^0$.

⁸ Includes unknown branching fraction to $\pi^+ \pi^-$.

⁹ Includes unknown branching fraction to $\eta\eta$.

$J/\psi(1S)$ mass (units 10^{-4})

$\Gamma(\gamma f_0(1710) \rightarrow \gamma\omega\omega)/\Gamma_{\text{total}}$ Γ_{276}/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_{277}/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 $J/\psi \rightarrow \gamma\eta\eta$

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

1.2 ± 0.4	² SARANTSEV	21	RVUE	$J/\psi(1S) \rightarrow \gamma(\pi\pi, K\bar{K}, \eta\eta, \omega\phi)$
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¹ From partial wave analysis including all possible combinations of 0^{++} , 2^{++} , and 4^{++} resonances.

² There is a further $(0.7 \pm 0.1) \times 10^{-4}$ scalar contribution at 1765 MeV.

$\Gamma(\gamma f_0(1710) \rightarrow \gamma\eta\eta')/\Gamma_{\text{total}}$ Γ_{278}/Γ

VALUE (units 10^{-5})	DOCUMENT ID	TECN	COMMENT
6.5 ± 2.5	¹ SARANTSEV	21	RVUE $J/\psi(1S) \rightarrow \gamma(\pi\pi, K\bar{K}, \eta\eta, \omega\phi)$

¹ There is a further $(2.5 \pm 1.1) \times 10^{-5}$ scalar contribution at 1765 MeV.

$\Gamma(\gamma f_0(1710) \rightarrow \gamma\omega\phi)/\Gamma_{\text{total}}$ Γ_{279}/Γ

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

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

0.1 ± 0.1	¹ SARANTSEV	21	RVUE	$J/\psi(1S) \rightarrow \gamma(\pi\pi, K\bar{K}, \eta\eta, \omega\phi)$
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¹ There is a further $(2.2 \pm 0.4) \times 10^{-4}$ scalar contribution at 1765 MeV.

$\Gamma(\gamma f_0(1750) \rightarrow \gamma K_S^0 K_S^0)/\Gamma_{\text{total}}$ Γ_{280}/Γ

VALUE (units 10^{-5})	DOCUMENT ID	TECN	COMMENT
1.11 ± 0.06^{+0.19}_{-0.32}	ABLIKIM	18AA	BES3 $J/\psi \rightarrow \gamma K_S^0 K_S^0$

$\Gamma(\gamma f_2(1810) \rightarrow \gamma \eta \eta) / \Gamma_{\text{total}}$ Γ_{281} / Γ

<u>VALUE (units 10^{-5})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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.

 $\Gamma(\gamma f_2(1910) \rightarrow \gamma \omega \omega) / \Gamma_{\text{total}}$ Γ_{282} / Γ

<u>VALUE (units 10^{-3})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.20\pm0.04\pm0.13	151	ABLIKIM	06H	BES $J/\psi \rightarrow \gamma \omega \omega$

 $\Gamma(\gamma f_2(1950) \rightarrow \gamma K^*(892) \bar{K}^*(892)) / \Gamma_{\text{total}}$ Γ_{283} / Γ

<u>VALUE (units 10^{-3})</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.7\pm0.1\pm0.2	BAI	00B	BES $J/\psi \rightarrow \gamma K^+ K^0 \pi^+ \pi^-$

 $\Gamma(\gamma f_0(2020) \rightarrow \gamma \pi \pi) / \Gamma_{\text{total}}$ Γ_{284} / Γ

<u>VALUE (units 10^{-5})</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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• • • We do not use the following data for averages, fits, limits, etc. • • •
 42 \pm 10 SARANTSEV 21 RVUE $J/\psi(1S) \rightarrow \gamma(\pi\pi, K\bar{K}, \eta\eta, \omega\phi)$

 $\Gamma(\gamma f_0(2020) \rightarrow \gamma K \bar{K}) / \Gamma_{\text{total}}$ Γ_{285} / Γ

<u>VALUE (units 10^{-5})</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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• • • We do not use the following data for averages, fits, limits, etc. • • •
 55 \pm 25 SARANTSEV 21 RVUE $J/\psi(1S) \rightarrow \gamma(\pi\pi, K\bar{K}, \eta\eta, \omega\phi)$

 $\Gamma(\gamma f_0(2020) \rightarrow \gamma \eta \eta) / \Gamma_{\text{total}}$ Γ_{286} / Γ

<u>VALUE (units 10^{-5})</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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• • • We do not use the following data for averages, fits, limits, etc. • • •
 10 \pm 10 SARANTSEV 21 RVUE $J/\psi(1S) \rightarrow \gamma(\pi\pi, K\bar{K}, \eta\eta, \omega\phi)$

 $\Gamma(\gamma f_4(2050)) / \Gamma_{\text{total}}$ Γ_{287} / Γ

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

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

 $\Gamma(\gamma f_0(2100) \rightarrow \gamma \eta \eta) / \Gamma_{\text{total}}$ Γ_{288} / Γ

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

• • • We do not use the following data for averages, fits, limits, etc. • • •
 1.8 \pm 1.5 SARANTSEV 21 RVUE $J/\psi(1S) \rightarrow \gamma(\pi\pi, K\bar{K}, \eta\eta, \omega\phi)$

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

 $\Gamma(\gamma f_0(2100) \rightarrow \gamma \pi \pi) / \Gamma_{\text{total}}$ Γ_{290} / Γ

<u>VALUE (units 10^{-4})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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6.24 \pm 0.48 \pm 0.87 744 ¹ DOBBS 15 $J/\psi \rightarrow \gamma \pi \pi$

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

2.0 \pm 0.8 SARANTSEV 21 RVUE $J/\psi(1S) \rightarrow \gamma(\pi\pi, K\bar{K}, \eta\eta, \omega\phi)$

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

$\Gamma(\gamma f_0(2100) \rightarrow \gamma K\bar{K})/\Gamma_{\text{total}}$ Γ_{289}/Γ

VALUE (units 10⁻⁵) DOCUMENT ID TECN COMMENT

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

32 \pm 20 SARANTSEV 21 RVUE $J/\psi(1S) \rightarrow \gamma(\pi\pi, K\bar{K}, \eta\eta, \omega\phi)$

$\Gamma(\gamma f_0(2200))/\Gamma_{\text{total}}$ Γ_{291}/Γ

VALUE (units 10⁻⁴) DOCUMENT ID TECN COMMENT

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

1.5 ¹ AUGUSTIN 88 DM2 $J/\psi \rightarrow \gamma K_S^0 K_S^0$

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

$\Gamma(\gamma f_0(2200) \rightarrow \gamma\pi\pi)/\Gamma_{\text{total}}$ Γ_{294}/Γ

VALUE (units 10⁻⁵) DOCUMENT ID TECN COMMENT

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

5 \pm 2 SARANTSEV 21 RVUE $J/\psi(1S) \rightarrow \gamma(\pi\pi, K\bar{K}, \eta\eta, \omega\phi)$

$\Gamma(\gamma f_0(2200) \rightarrow \gamma K\bar{K})/\Gamma_{\text{total}}$ Γ_{292}/Γ

VALUE (units 10⁻⁴) EVTS DOCUMENT ID TECN COMMENT

5.86 \pm 0.49 \pm 1.20 490 ¹ DOBBS 15 $J/\psi \rightarrow \gamma K\bar{K}$

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

0.5 \pm 0.5 SARANTSEV 21 RVUE $J/\psi(1S) \rightarrow \gamma(\pi\pi, K\bar{K}, \eta\eta, \omega\phi)$

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

$\Gamma(\gamma f_0(2200) \rightarrow \gamma K_S^0 K_S^0)/\Gamma_{\text{total}}$ Γ_{293}/Γ

VALUE (units 10⁻⁴) DOCUMENT ID TECN COMMENT

2.72 $^{+0.08+0.17}_{-0.06-0.47}$ ABLIKIM 18AA BES3 $J/\psi \rightarrow \gamma K_S^0 K_S^0$

$\Gamma(\gamma f_0(2200) \rightarrow \gamma\eta\eta)/\Gamma_{\text{total}}$ Γ_{295}/Γ

VALUE (units 10⁻⁵) DOCUMENT ID TECN COMMENT

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

0.7 \pm 0.4 SARANTSEV 21 RVUE $J/\psi(1S) \rightarrow \gamma(\pi\pi, K\bar{K}, \eta\eta, \omega\phi)$

$\Gamma(\gamma f_J(2220))/\Gamma_{\text{total}}$ Γ_{296}/Γ

VALUE (units 10⁻⁵) CL% EVTS DOCUMENT ID TECN COMMENT

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

>300 ¹ BAI 96B BES $e^+e^- \rightarrow \gamma \bar{p}p, K\bar{K}$

>250 99.9 ² HASAN 96 SPEC $\bar{p}p \rightarrow \pi^+\pi^-$

< 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 BARNES 93.

² Using BAI 96B.

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_{297} / Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID	TECN	COMMENT
< 3.9	90	1,2 DOBBS	15	$J/\psi \rightarrow \gamma \pi \pi$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
14 ± 8 ± 4		BAI	98H BES	$J/\psi \rightarrow \gamma \pi^0 \pi^0$
$8.4 \pm 2.6 \pm 3.0$		BAI	96B BES	$e^+ e^- \rightarrow J/\psi \rightarrow \gamma \pi^+ \pi^-$

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

² For $\Gamma = 20/50$ MeV, the 90% CL upper limits for $\pi^+ \pi^-$ and $\pi^0 \pi^0$ are $2.6/5.2 \times 10^{-5}$ and $1.3/1.9 \times 10^{-5}$, respectively.

$\Gamma(\gamma f_J(2220) \rightarrow \gamma K \bar{K}) / \Gamma_{\text{total}}$ Γ_{298} / Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID	TECN	COMMENT
< 4.1	90	1,2 DOBBS	15	$J/\psi \rightarrow \gamma K \bar{K}$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
< 3.6		³ DEL-AMO-SA..100	BABR	$e^+ e^- \rightarrow J/\psi \rightarrow \gamma K^+ K^-$
< 2.9		³ DEL-AMO-SA..100	BABR	$e^+ e^- \rightarrow J/\psi \rightarrow \gamma K_S^0 K_S^0$
$6.6 \pm 2.9 \pm 2.4$		BAI	96B BES	$e^+ e^- \rightarrow J/\psi \rightarrow \gamma K^+ K^-$
$10.8 \pm 4.0 \pm 3.2$		BAI	96B BES	$e^+ e^- \rightarrow J/\psi \rightarrow \gamma K_S^0 K_S^0$

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

² For $\Gamma = 20/50$ MeV, the 90% CL upper limits for $K^+ K^-$ and $K_S^0 K_S^0$ are $1.7/3.1 \times 10^{-5}$ and $1.2/2.0 \times 10^{-5}$, respectively.

³ 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_{299} / Γ

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

$\Gamma(\gamma f_0(2330) \rightarrow \gamma K_S^0 K_S^0) / \Gamma_{\text{total}}$ Γ_{300} / Γ

VALUE (units 10^{-5})	DOCUMENT ID	TECN	COMMENT
$4.95 \pm 0.21^{+0.66}_{-0.72}$	ABLIKIM	18AA BES3	$J/\psi \rightarrow \gamma K_S^0 K_S^0$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
0.6 ± 0.1	SARANTSEV	21 RVUE	$J/\psi(1S) \rightarrow \gamma (\pi \pi, K \bar{K}, \eta \eta, \omega \phi)$

$\Gamma(\gamma f_0(2330) \rightarrow \gamma \pi \pi) / \Gamma_{\text{total}}$ Γ_{301} / Γ

VALUE (units 10^{-5})	DOCUMENT ID	TECN	COMMENT
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• • • We do not use the following data for averages, fits, limits, etc. • • •

4 ± 2	SARANTSEV	21	RVUE $J/\psi(1S) \rightarrow \gamma(\pi\pi, K\bar{K}, \eta\eta, \omega\phi)$
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 $\Gamma(\gamma f_0(2330) \rightarrow \gamma \eta \eta) / \Gamma_{\text{total}}$ Γ_{302} / Γ

VALUE (units 10^{-5})	DOCUMENT ID	TECN	COMMENT
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• • • We do not use the following data for averages, fits, limits, etc. • • •

1.5 ± 0.4	SARANTSEV	21	RVUE $J/\psi(1S) \rightarrow \gamma(\pi\pi, K\bar{K}, \eta\eta, \omega\phi)$
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 $\Gamma(\gamma f_2(2340) \rightarrow \gamma \eta \eta) / \Gamma_{\text{total}}$ Γ_{303} / 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 $J/\psi \rightarrow \gamma \eta \eta$
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¹ From partial wave analysis including all possible combinations of 0^{++} , 2^{++} , and 4^{++} resonances. $\Gamma(\gamma f_2(2340) \rightarrow \gamma K_S^0 K_S^0) / \Gamma_{\text{total}}$ Γ_{304} / Γ

VALUE (units 10^{-5})	DOCUMENT ID	TECN	COMMENT
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$5.54^{+0.34+3.82}_{-0.40-1.49}$	ABLIKIM	18AA	BES3 $J/\psi \rightarrow \gamma K_S^0 K_S^0$
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 $\Gamma(\gamma X(1835) \rightarrow \gamma \pi^+ \pi^- \eta') / \Gamma_{\text{total}}$ Γ_{305} / Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
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2.7 $^{+0.6}_{-0.8}$ OUR AVERAGE Error includes scale factor of 1.6.

$3.93 \pm 0.38^{+0.31}_{-0.84}$		¹ ABLIKIM	16J	BES3 $J/\psi \rightarrow \gamma \pi^+ \pi^- \eta'$
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$2.2 \pm 0.4 \pm 0.4$	264	ABLIKIM	05R	BES2 $J/\psi \rightarrow \gamma \pi^+ \pi^- \eta'$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

$2.87 \pm 0.09^{+0.49}_{-0.52}$	4265	² ABLIKIM	11C	BES3 $J/\psi \rightarrow \gamma \pi^+ \pi^- \eta'$
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¹ From a fit of the measured $\pi^+ \pi^- \eta'$ lineshape that accounts for the abrupt distortion observed at the $p\bar{p}$ threshold with a Flatté formula in addition to known backgrounds and contributors, as well as an *ad hoc* Breit-Wigner ($M \approx 1919$ MeV; $\Gamma \approx 51$ MeV) that is required for a good fit. Another explanation for the distortion provided by ABLIKIM 16J is that a second resonance near 1870 MeV interferes with the $X(1835)$; fits to this possibility yield product branching fraction values compatible with that shown within the respective systematic uncertainties.² From a fit of the $\pi^+ \pi^- \eta'$ mass distribution to a combination of $\gamma f_1(1510)$, $\gamma X(1835)$, and two states $\gamma X(2120)$ and $\gamma X(2370)$, for $M(\pi^+ \pi^- \eta') < 2.8$ 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_{306} / Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
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0.77 $^{+0.15}_{-0.09}$ OUR AVERAGE

$0.90^{+0.04+0.27}_{-0.11-0.55}$		¹ ABLIKIM	12D	BES3 $J/\psi \rightarrow \gamma p \bar{p}$
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$1.14^{+0.43+0.42}_{-0.30-0.26}$	231	² ALEXANDER	10	CLEO $J/\psi \rightarrow \gamma p \bar{p}$
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$0.70 \pm 0.04^{+0.19}_{-0.08}$ 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.

$\Gamma(\gamma X(1835) \rightarrow \gamma K_S^0 K_S^0 \eta) / \Gamma_{\text{total}}$ Γ_{307} / Γ

VALUE (units 10^{-5})	DOCUMENT ID	TECN	COMMENT
$3.31^{+0.33+1.96}_{-0.30-1.29}$	ABLIKIM	15T BES3	$J/\psi \rightarrow \gamma K_S^0 K_S^0 \eta$

$\Gamma(\gamma X(1835) \rightarrow \gamma \gamma \phi(1020)) / \Gamma_{\text{total}}$ Γ_{308} / Γ

VALUE (units 10^{-6})	EVTS	DOCUMENT ID	TECN	COMMENT
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• • • We do not use the following data for averages, fits, limits, etc. • • •

$1.77 \pm 0.35 \pm 0.25$	305	¹ ABLIKIM	18I BES3	$J/\psi \rightarrow \gamma \gamma \phi(1020)$
$8.09 \pm 1.99 \pm 1.36$	1.3k	² ABLIKIM	18I BES3	$J/\psi \rightarrow \gamma \gamma \phi(1020)$

¹ Constructive interference between the $X(1835)$ and $\eta(1405)/\eta(1475)$ is assumed in a fit to the $\gamma \phi$ invariant mass.

² Destructive interference between the $X(1835)$ and $\eta(1405)/\eta(1475)$ is assumed in a fit to the $\gamma \phi$ invariant mass.

$\Gamma(\gamma X(1835) \rightarrow \gamma \gamma \gamma) / \Gamma_{\text{total}}$ Γ_{309} / Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$< 3.56 \times 10^{-6}$	90	ABLIKIM	18O BES3	$\psi(2S) \rightarrow \pi^+ \pi^- \gamma \gamma \gamma$

$\Gamma(\gamma X(1835) \rightarrow \gamma 3(\pi^+ \pi^-)) / \Gamma_{\text{total}}$ Γ_{310} / Γ

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

$\Gamma(\gamma X(2370) \rightarrow \gamma K^+ K^- \eta') / \Gamma_{\text{total}}$ Γ_{311} / Γ

VALUE (units 10^{-5})	DOCUMENT ID	TECN	COMMENT
$1.79 \pm 0.23 \pm 0.65$	ABLIKIM	20Q BES3	$J/\psi \rightarrow \gamma K^+ K^- \eta'$

$\Gamma(\gamma X(2370) \rightarrow \gamma K_S^0 K_S^0 \eta') / \Gamma_{\text{total}}$ Γ_{312} / Γ

VALUE (units 10^{-5})	DOCUMENT ID	TECN	COMMENT
$1.18 \pm 0.32 \pm 0.39$	ABLIKIM	20Q BES3	$J/\psi \rightarrow \gamma K_S^0 K_S^0 \eta'$

$\Gamma(\gamma X(2370) \rightarrow \gamma \eta \eta \eta') / \Gamma_{\text{total}}$ Γ_{313} / Γ

VALUE (units 10^{-6})	CL%	DOCUMENT ID	TECN	COMMENT
< 9.2	90	ABLIKIM	21C BES3	$J/\psi(1S) \rightarrow \gamma \eta \eta \eta'$

$\Gamma(\gamma p \bar{p}) / \Gamma_{\text{total}}$ Γ_{314} / Γ

VALUE (units 10^{-3})	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$0.38 \pm 0.07 \pm 0.07$		49	EATON	84	MRK2 $e^+ e^-$

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

< 0.11	90	PERUZZI	78	MRK1 $e^+ e^-$
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$\Gamma(\gamma\rho\bar{\rho}\pi^+\pi^-)/\Gamma_{\text{total}}$ Γ_{315}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<0.79 \times 10^{-3}$	90	EATON	84	MRK2 e^+e^-

 $\Gamma(\gamma\Lambda\bar{\Lambda})/\Gamma_{\text{total}}$ Γ_{316}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<0.13 \times 10^{-3}$	90	HENRARD	87	DM2 e^+e^-

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

$<0.16 \times 10^{-3}$	90	BAI	98G	BES e^+e^-
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 $\Gamma(\gamma A \rightarrow \gamma \text{invisible})/\Gamma_{\text{total}}$ Γ_{317}/Γ

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$<1.7 \times 10^{-6}$	90	88M	¹ ABLIKIM	20K	BES3 $\psi(2S) \rightarrow J/\psi\pi^+\pi^-$

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

$<6.3 \times 10^{-6}$	90	3.7M	² INSLER	10	CLEO $\psi(2S) \rightarrow J/\psi\pi^+\pi^-$
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¹ For a narrow state A with mass $m_A < 1.2$ GeV. The limit varies with m_A , reaching its largest value of 1.7×10^{-6} at 1.2 GeV and being 7.0×10^{-7} for $m_A = 0$.

² The limit varies with mass m_A of a narrow state A and is 4.3×10^{-6} for $m_A = 0$, 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_{318}/Γ
(narrow state A^0 with $0.2 \text{ GeV} < m_{A^0} < 3 \text{ GeV}$)

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<0.5 \times 10^{-5}$	90	¹ ABLIKIM	16E	BES3 $J/\psi \rightarrow \gamma\mu^+\mu^-$

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

$<2.1 \times 10^{-5}$	90	² ABLIKIM	12	BES3 $J/\psi \rightarrow \gamma\mu^+\mu^-$
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¹ For a narrow scalar or pseudoscalar, A^0 , with a mass in the range 0.212–3 GeV. The measured 90% CL limit as a function of m_{A^0} is in the range $(2.8\text{--}495.3) \times 10^{-8}$.

² 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_{319}/Γ

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

 $\Gamma(\eta e^+ e^-)/\Gamma_{\text{total}}$ Γ_{320}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT
$1.42 \pm 0.04 \pm 0.07$	2.47k	^{1,2} ABLIKIM	19A	BES3 $J/\psi \rightarrow \eta e^+ e^-$

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

$1.16 \pm 0.07 \pm 0.06$	320	¹ ABLIKIM	14I	BES3 $J/\psi \rightarrow \eta e^+ e^-$
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¹ Using both $\eta \rightarrow \gamma\gamma$ and $\eta \rightarrow \pi^+\pi^-\pi^0$ decays.

² Approximation of the transition form factor squared as an incoherent sum of the ρ -meson and one-pole non-resonant amplitudes gives the pole mass $m(\Lambda) = 2.56 \pm 0.04 \pm 0.03$ GeV. Supersedes ABLIKIM 14I.

$\Gamma(\eta'(958)e^+e^-)/\Gamma_{\text{total}}$ Γ_{321}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT
$6.59 \pm 0.07 \pm 0.17$	8.9k	¹ ABLIKIM	19H BES3	$J/\psi \rightarrow \eta'(958)e^+e^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$5.81 \pm 0.16 \pm 0.31$	1.4k	^{1,2} ABLIKIM	14I BES3	$J/\psi \rightarrow \eta'(958)e^+e^-$

¹ Using both $\eta' \rightarrow \gamma\pi^+\pi^-$ and $\eta' \rightarrow \pi^+\pi^-\eta$ decays.² Superseded by ABLIKIM 19H. $\Gamma(\eta U \rightarrow \eta e^+e^-)/\Gamma_{\text{total}}$ Γ_{322}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$< 9.11 \times 10^{-7}$	90	¹ ABLIKIM	19A BES3	$J/\psi \rightarrow \eta e^+e^-$

¹ For a dark photon U with mass between 10 and 2400 MeV. Obtained 90% C.L. limits as a function of m_U range from 1.9×10^{-8} to 91.1×10^{-8} . $\Gamma(\eta'(958)U \rightarrow \eta'(958)e^+e^-)/\Gamma_{\text{total}}$ Γ_{323}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$< 2.0 \times 10^{-7}$	90	¹ ABLIKIM	19H BES3	$J/\psi \rightarrow \eta'(958)e^+e^-$

¹ For a dark photon U with mass between 100 and 2100 MeV. Obtained 90% C.L. limits as a function of m_U range from 1.8×10^{-8} to 2.0×10^{-7} . The corresponding limits on the branching fraction $J/\psi \rightarrow \eta'U$ range from 5.7×10^{-8} to 7.4×10^{-7} . $\Gamma(\phi e^+e^-)/\Gamma_{\text{total}}$ Γ_{324}/Γ

VALUE (units 10^{-7})	CL%	DOCUMENT ID	TECN	COMMENT
< 1.2	90	¹ ABLIKIM	19AB BES3	$J/\psi \rightarrow \phi e^+e^-$

¹ Using $B(\phi \rightarrow K^+K^-) = (48.9 \pm 0.5)\%$ and $B(\psi(2S) \rightarrow \pi^+\pi^-J/\psi) = (34.49 \pm 0.30)\%$.

WEAK DECAYS

 $\Gamma(D^- e^+ \nu_e + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{325}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$< 7.1 \times 10^{-8}$	90	ABLIKIM	21Q BES3	$e^+e^- \rightarrow J/\psi$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$< 1.2 \times 10^{-5}$	90	ABLIKIM	06M BES2	$e^+e^- \rightarrow J/\psi$

 $\Gamma(\bar{D}^0 e^+ e^- + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{326}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$< 8.5 \times 10^{-8}$	90	¹ ABLIKIM	17AF BES3	$e^+e^- \rightarrow J/\psi$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$< 1.1 \times 10^{-5}$	90	ABLIKIM	06M BES2	$e^+e^- \rightarrow J/\psi$

¹ Using D^0 decays to $K^-\pi^+$, $K^-\pi^+\pi^0$, and $K^-\pi^+\pi^+\pi^-$. $\Gamma(D_s^- e^+ \nu_e + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{327}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$< 1.3 \times 10^{-6}$	90	ABLIKIM	14R BES3	$e^+e^- \rightarrow J/\psi$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$< 3.6 \times 10^{-5}$	90	¹ ABLIKIM	06M BES2	$e^+e^- \rightarrow J/\psi$

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

$\Gamma(D_s^{*-} e^+ \nu_e + \text{c.c.})/\Gamma_{\text{total}}$					Γ_{328}/Γ
<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
$<1.8 \times 10^{-6}$	90	ABLIKIM	14R	BES3	$e^+ e^- \rightarrow J/\psi$

$\Gamma(D^- \pi^+ + \text{c.c.})/\Gamma_{\text{total}}$					Γ_{329}/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	$e^+ e^- \rightarrow J/\psi$

$\Gamma(\overline{D}^0 \overline{K}^0 + \text{c.c.})/\Gamma_{\text{total}}$					Γ_{330}/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	$e^+ e^- \rightarrow J/\psi$

$\Gamma(\overline{D}^0 \overline{K}^{*0} + \text{c.c.})/\Gamma_{\text{total}}$					Γ_{331}/Γ
<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
$<2.5 \times 10^{-6}$	90	ABLIKIM	14K	BES3	$e^+ e^- \rightarrow J/\psi$

$\Gamma(D_s^- \pi^+ + \text{c.c.})/\Gamma_{\text{total}}$					Γ_{332}/Γ
<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
$<1.3 \times 10^{-4}$	90	ABLIKIM	08J	BES2	$e^+ e^- \rightarrow J/\psi$

$\Gamma(D_s^- \rho^+ + \text{c.c.})/\Gamma_{\text{total}}$					Γ_{333}/Γ
<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
$<1.3 \times 10^{-5}$	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_{334}/Γ
<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
$<2.7 \times 10^{-7}$	90	ABLIKIM	14Q	BES3	$\psi(2S) \rightarrow \pi^+ \pi^- J/\psi$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●					
$<0.5 \times 10^{-5}$	90	ADAMS	08	CLEO	$\psi(2S) \rightarrow \pi^+ \pi^- J/\psi$
$<1.6 \times 10^{-4}$	90	¹ WICHT	08	BELL	$B^\pm \rightarrow K^\pm \gamma\gamma$
$<2.2 \times 10^{-5}$	90	ABLIKIM	07J	BES2	$\psi(2S) \rightarrow J/\psi \pi^+ \pi^-$
$<50 \times 10^{-5}$	90	BARTEL	77	CNTR	$e^+ e^-$

¹ WICHT 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 $B(B^+ \rightarrow J/\psi(1S) K^+) = 1.020 \times 10^{-3}$.

$\Gamma(\gamma\phi)/\Gamma_{\text{total}}$					Γ_{335}/Γ
<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
$<1.4 \times 10^{-6}$	90	ABLIKIM	14Q	BES3	$\psi(2S) \rightarrow \pi^+ \pi^- J/\psi$

$\Gamma(e^\pm \mu^\mp)/\Gamma_{\text{total}}$					Γ_{336}/Γ
<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
$<1.6 \times 10^{-7}$	90	ABLIKIM	13L	BES3	$e^+ e^- \rightarrow J/\psi$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●					
$<1.1 \times 10^{-6}$	90	BAI	03D	BES	$e^+ e^- \rightarrow J/\psi$

$\Gamma(e^\pm \tau^\mp)/\Gamma_{\text{total}}$ Γ_{337}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<7.5 \times 10^{-8}$	90	ABLIKIM 21M	BES3	$e^+e^- \rightarrow J/\psi$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$<8.3 \times 10^{-6}$	90	¹ ABLIKIM 04	BES	$e^+e^- \rightarrow J/\psi$
¹ Superseded by ABLIKIM 21M.				

$\Gamma(\mu^\pm \tau^\mp)/\Gamma_{\text{total}}$ Γ_{338}/Γ

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

$\Gamma(\Lambda_c^+ e^- + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{339}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<6.9 \times 10^{-8}$	90	ABLIKIM 19AF	BES3	$e^+e^- \rightarrow J/\psi \rightarrow pK^- \pi^+ e^- (+ \text{c.c.})$

OTHER DECAYS

$\Gamma(\text{invisible})/\Gamma(e^+e^-)$ Γ_{340}/Γ_5

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<6.6 \times 10^{-2}$	90	LEES 13I	BABR	$B \rightarrow K^{(*)} J/\psi$

$\Gamma(\text{invisible})/\Gamma(\mu^+\mu^-)$ Γ_{340}/Γ_7

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

$J/\psi(1S)$ REFERENCES

ABLIKIM 21AM	PR D104 092004	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM 21AT	JHEP 2111 226	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM 21C	PR D103 012009	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM 21M	PR D103 112007	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM 21Q	JHEP 2106 157	M. Ablikim <i>et al.</i>	(BESIII Collab.)
LEES 21	PR D103 092001	J.P. Lees <i>et al.</i>	(BABAR Collab.)
LEES 21B	PR D104 112003	J.P. Lees <i>et al.</i>	(BABAR Collab.)
LEES 21C	PR D104 112004	J.P. Lees <i>et al.</i>	(BABAR Collab.)
SARANTSEV 21	PL B816 136227	A.V. Sarantsev <i>et al.</i>	(BONN, PNPI)
ABLIKIM 20	PR D101 012004	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM 20K	PR D101 112005	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM 20Q	EPJ C80 746	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ANASHIN 20	JHEP 2007 112	V. V. Anashin <i>et al.</i>	(KEDR Collab.)
ABLIKIM 19A	PR D99 012006	M. Ablikim <i>et al.</i>	(BESIII Collab.)
Also	PR D104 099901 (errat.)	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM 19AB	PR D99 052010	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM 19AC	PR D99 071101	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM 19AF	PR D99 072006	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM 19AN	PR D99 112008	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM 19AQ	PR D100 032004	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM 19H	PR D99 012013	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM 19N	PR D99 032006	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM 19Q	PL B791 375	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM 19T	PRL 122 142002	M. Ablikim <i>et al.</i>	(BESIII Collab.)
LU 19	PR D99 032003	P.-C. Lu <i>et al.</i>	(BELLE Collab.)
ABLIKIM 18AA	PR D98 072003	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM 18AB	PR D98 072005	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM 18D	PRL 121 022001	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM 18I	PR D97 051101	M. Ablikim <i>et al.</i>	(BESIII Collab.)

ABLIKIM	18O	PR D97 072014	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ANASHIN	18A	JHEP 1805 119	V.V. Anashin <i>et al.</i>	(KEDR Collab.)
LEES	18	PR D97 052007	J.P. Lees <i>et al.</i>	(BABAR Collab.)
LEES	18E	PR D98 112015	J.P. Lees <i>et al.</i>	(BABAR Collab.)
ABLIKIM	17AF	PR D96 111101	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM	17AH	PR D96 112001	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM	17AK	PR D96 112012	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM	17E	PL B770 217	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM	17L	PR D95 052003	M. Ablikim <i>et al.</i>	(BESIII Collab.)
LEES	17A	PR D95 052001	J.P. Lees <i>et al.</i>	(BABAR Collab.)
LEES	17C	PR D95 072007	J.P. Lees <i>et al.</i>	(BABAR Collab.)
LEES	17D	PR D95 092005	J.P. Lees <i>et al.</i>	(BABAR Collab.)
ABLIKIM	16E	PR D93 052005	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM	16J	PRL 117 042002	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM	16K	PR D93 052010	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM	16L	PR D93 072003	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM	16M	PR D93 072008	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM	16N	PR D93 112011	M. Ablikim	(BESIII Collab.)
ABLIKIM	16P	PR D94 072005	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM	16Q	PL B761 98	M. Ablikim <i>et al.</i>	(BESIII Collab.)
PDG	16	CP C40 100001	C. Patrignani <i>et al.</i>	(PDG Collab.)
AAIJ	15BI	EPJ C75 311	R. Aaij <i>et al.</i>	(LHCb Collab.)
ABLIKIM	15AE	PR D92 052003	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM	15H	PR D91 052017	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM	15K	PR D91 112001	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM	15P	PR D92 012007	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM	15T	PRL 115 091803	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ANASHIN	15	PL B749 50	V.V. Anashin <i>et al.</i>	(KEDR Collab.)
DOBBS	15	PR D91 052006	S. Dobbs <i>et al.</i>	(NWES)
LEES	15J	PR D92 072008	J.P. Lees <i>et al.</i>	(BABAR Collab.)
ABLIKIM	14I	PR D89 092008	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM	14K	PR D89 071101	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM	14N	PR D90 052009	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM	14Q	PR D90 092002	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM	14R	PR D90 112014	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ANASHIN	14	PL B738 391	V.V. Anashin <i>et al.</i>	(KEDR Collab.)
AULCHENKO	14	PL B731 227	V.M. Aulchenko <i>et al.</i>	(KEDR Collab.)
LEES	14H	PR D89 092002	J.P. Lees <i>et al.</i>	(BABAR Collab.)
ABLIKIM	13F	PR D87 052007	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM	13I	PR D87 032003	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM	13J	PR D87 032008	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM	13L	PR D87 112007	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM	13N	PR D87 092009	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM	13P	PR D87 112004	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM	13R	PR D88 032007	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM	13U	PR D88 091502	M. Ablikim <i>et al.</i>	(BESIII 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>	(BESIII Collab.)
ABLIKIM	12B	PR D86 032008	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM	12C	PR D86 032014	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM	12D	PRL 108 112003	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM	12H	PL B710 594	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM	12P	CP C36 1031	M. Ablikim <i>et al.</i>	(BES II Collab.)
LEES	12E	PR D85 112009	J.P. Lees <i>et al.</i>	(BABAR Collab.)
LEES	12F	PR D86 012008	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>	(BESIII Collab.)
ABLIKIM	11C	PRL 106 072002	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM	11D	PR D83 032003	M. Ablikim <i>et al.</i>	(BESIII 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	06	PR D73 011101	B. Aubert <i>et al.</i>	(BABAR 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 and 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 2181	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+)
BALTRUSAITIS...	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)
BALTRUSAITIS...	86	PR D33 629	R.M. Baltrusaitis <i>et al.</i>	(Mark III Collab.)
BALTRUSAITIS...	86B	PR D33 1222	R.M. Baltrusaitis <i>et al.</i>	(Mark III Collab.)
BALTRUSAITIS...	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.)
BALTRUSAITIS...	85C	PRL 55 1723	R.M. Baltrusaitis <i>et al.</i>	(CIT, UCSC+)
BALTRUSAITIS...	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)
BALTRUSAITIS...	84	Translated from YAF 41 733	R.M. Baltrusaitis <i>et al.</i>	(CIT, UCSC+)
EATON	84	PRL 52 2126	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	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, MAINZ)
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	Also	SJNP 34 814	A.A. Zholents <i>et al.</i>	(NOVO)
		Translated from YAF 34 1471.		

BRANDELIK	79C	ZPHY C1 233	R. Brandelik <i>et al.</i>	(DASP Collab.)
ALEXANDER	78	PL 72B 493	G. Alexander <i>et al.</i>	(DESY, HAMB, SIEG+)
BESCH	78	PL 78B 347	H.J. Besch <i>et al.</i>	(BONN, DESY, MAINZ)
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)
