

$J/\psi(1S)$

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

 $J/\psi(1S)$ MASS

VALUE (MeV)	EVTs	DOCUMENT ID	TECN	COMMENT
3096.916±0.011 OUR AVERAGE				
3096.917±0.010±0.007		AULCHENKO 03	KEDR	$e^+e^- \rightarrow \text{hadrons}$
3096.89 ±0.09	502	¹ ARTAMONOV 00	OLYA	$e^+e^- \rightarrow \text{hadrons}$
3096.91 ±0.03 ±0.01		² ARMSTRONG 93B	E760	$\bar{p}p \rightarrow e^+e^-$
3096.95 ±0.1 ±0.3	193	BAGLIN 87	SPEC	$\bar{p}p \rightarrow e^+e^-X$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
3097.5 ±0.3		GRIBUSHIN 96	FMPs	515 $\pi^- \text{Be} \rightarrow 2\mu X$
3098.4 ±2.0	38k	LEMOIGNE 82	GOLI	185 $\pi^- \text{Be} \rightarrow \gamma \mu^+ \mu^- A$
3096.93 ±0.09	502	³ ZHOLENTZ 80	REDE	e^+e^-
3097.0 ±1		⁴ BRANDELIK 79C	DASP	e^+e^-

¹ Reanalysis of ZHOLENTZ 80 using new electron mass (COHEN 87) and radiative corrections (KURAEV 85).

² Mass central value and systematic error recalculated by us according to Eq. (16) in ARMSTRONG 93B, using the value for the $\psi(2S)$ mass from AULCHENKO 03.

³ Superseded by ARTAMONOV 00.

⁴ From a simultaneous fit to e^+e^- , $\mu^+\mu^-$ and hadronic channels assuming $\Gamma(e^+e^-) = \Gamma(\mu^+\mu^-)$.

 $J/\psi(1S)$ WIDTH

VALUE (keV)	EVTs	DOCUMENT ID	TECN	COMMENT
93.4± 2.1 OUR AVERAGE				
96.1± 3.2	13k	⁵ ADAMS 06A	CLEO	$e^+e^- \rightarrow \mu^+\mu^-\gamma$
93.7± 3.5	7.8k	⁵ AUBERT 04	BABR	$e^+e^- \rightarrow \mu^+\mu^-\gamma$
84.4± 8.9		BAI 95B	BES	e^+e^-
99 ±12 ±6		ARMSTRONG 93B	E760	$\bar{p}p \rightarrow e^+e^-$
85.5 ⁺ ₋ 6.1 5.8		⁶ HSUEH 92	RVUE	See Υ mini-review

⁵ Calculated by us from the reported values of $\Gamma(e^+e^-) \times B(\mu^+\mu^-)$ using $B(e^+e^-) = (5.94 \pm 0.06)\%$ and $B(\mu^+\mu^-) = (5.93 \pm 0.06)\%$.

⁶ Using data from COFFMAN 92, BALDINI-CELIO 75, BOYARSKI 75, ESPOSITO 75B, BRANDELIK 79C.

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

Mode	Fraction (Γ_i/Γ)	Scale factor/ Confidence level
Γ_1 hadrons	(87.7 ±0.5) %	
Γ_2 virtual $\gamma \rightarrow$ hadrons	(13.50±0.30) %	
Γ_3 e^+e^-	(5.94±0.06) %	
Γ_4 $\mu^+\mu^-$	(5.93±0.06) %	

Decays involving hadronic resonances

Γ_5	$\rho\pi$	(1.69 \pm 0.15) %	S=2.4
Γ_6	$\rho^0\pi^0$	(5.6 \pm 0.7) $\times 10^{-3}$	
Γ_7	$a_2(1320)\rho$	(1.09 \pm 0.22) %	
Γ_8	$\omega\pi^+\pi^+\pi^-\pi^-$	(8.5 \pm 3.4) $\times 10^{-3}$	
Γ_9	$\omega\pi^+\pi^+\pi^0$	(4.0 \pm 0.7) $\times 10^{-3}$	
Γ_{10}	$\omega\pi^+\pi^-$	(7.2 \pm 1.0) $\times 10^{-3}$	
Γ_{11}	$\omega f_2(1270)$	(4.3 \pm 0.6) $\times 10^{-3}$	
Γ_{12}	$K^*(892)^0\bar{K}^*(1430)^0 + \text{c.c.}$	(6.7 \pm 2.6) $\times 10^{-3}$	
Γ_{13}	$\omega K^*(892)\bar{K} + \text{c.c.}$	(5.3 \pm 2.0) $\times 10^{-3}$	
Γ_{14}	$K^+\bar{K}^*(892)^- + \text{c.c.}$	(5.0 \pm 0.4) $\times 10^{-3}$	
Γ_{15}	$K^0\bar{K}^*(892)^0 + \text{c.c.}$	(4.2 \pm 0.4) $\times 10^{-3}$	
Γ_{16}	$K_1(1400)^\pm K^\mp$	(3.8 \pm 1.4) $\times 10^{-3}$	
Γ_{17}	$\omega\pi^0\pi^0$	(3.4 \pm 0.8) $\times 10^{-3}$	
Γ_{18}	$b_1(1235)^\pm\pi^\mp$	[a] (3.0 \pm 0.5) $\times 10^{-3}$	
Γ_{19}	$\omega K^\pm K_S^0\pi^\mp$	[a] (2.9 \pm 0.7) $\times 10^{-3}$	
Γ_{20}	$b_1(1235)^0\pi^0$	(2.3 \pm 0.6) $\times 10^{-3}$	
Γ_{21}	$\phi K^*(892)\bar{K} + \text{c.c.}$	(2.04 \pm 0.28) $\times 10^{-3}$	
Γ_{22}	$\omega K\bar{K}$	(1.9 \pm 0.4) $\times 10^{-3}$	
Γ_{23}	$\omega f_0(1710) \rightarrow \omega K\bar{K}$	(4.8 \pm 1.1) $\times 10^{-4}$	
Γ_{24}	$\phi 2(\pi^+\pi^-)$	(1.66 \pm 0.23) $\times 10^{-3}$	
Γ_{25}	$\Delta(1232)^{++}\bar{p}\pi^-$	(1.6 \pm 0.5) $\times 10^{-3}$	
Γ_{26}	$\omega\eta$	(1.74 \pm 0.20) $\times 10^{-3}$	S=1.6
Γ_{27}	$\phi K\bar{K}$	(1.83 \pm 0.24) $\times 10^{-3}$	S=1.5
Γ_{28}	$\phi f_0(1710) \rightarrow \phi K\bar{K}$	(3.6 \pm 0.6) $\times 10^{-4}$	
Γ_{29}	$p\bar{p}\omega$	(1.30 \pm 0.25) $\times 10^{-3}$	S=1.3
Γ_{30}	$\Delta(1232)^{++}\bar{\Delta}(1232)^{--}$	(1.10 \pm 0.29) $\times 10^{-3}$	
Γ_{31}	$\Sigma(1385)^-\bar{\Sigma}(1385)^+ (\text{or c.c.})$	[a] (1.03 \pm 0.13) $\times 10^{-3}$	
Γ_{32}	$p\bar{p}\eta'(958)$	(9 \pm 4) $\times 10^{-4}$	S=1.7
Γ_{33}	$\phi f_2'(1525)$	(8 \pm 4) $\times 10^{-4}$	S=2.7
Γ_{34}	$\phi\pi^+\pi^-$	(9.4 \pm 1.5) $\times 10^{-4}$	S=1.7
Γ_{35}	$\phi K^\pm K_S^0\pi^\mp$	[a] (7.2 \pm 0.9) $\times 10^{-4}$	
Γ_{36}	$\omega f_1(1420)$	(6.8 \pm 2.4) $\times 10^{-4}$	
Γ_{37}	$\phi\eta$	(7.4 \pm 0.8) $\times 10^{-4}$	S=1.5
Γ_{38}	$\Xi(1530)^-\Xi^+$	(5.9 \pm 1.5) $\times 10^{-4}$	
Γ_{39}	$pK^-\bar{\Sigma}(1385)^0$	(5.1 \pm 3.2) $\times 10^{-4}$	
Γ_{40}	$\omega\pi^0$	(4.5 \pm 0.5) $\times 10^{-4}$	S=1.4
Γ_{41}	$\phi\eta'(958)$	(4.0 \pm 0.7) $\times 10^{-4}$	S=2.1
Γ_{42}	$\phi f_0(980)$	(3.2 \pm 0.9) $\times 10^{-4}$	S=1.9
Γ_{43}	$\Xi(1530)^0\Xi^0$	(3.2 \pm 1.4) $\times 10^{-5}$	
Γ_{44}	$\Sigma(1385)^-\bar{\Sigma}^+ (\text{or c.c.})$	[a] (3.1 \pm 0.5) $\times 10^{-4}$	
Γ_{45}	$\phi f_1(1285)$	(2.6 \pm 0.5) $\times 10^{-4}$	S=1.1
Γ_{46}	$\rho\eta$	(1.93 \pm 0.23) $\times 10^{-4}$	
Γ_{47}	$\omega\eta'(958)$	(1.82 \pm 0.21) $\times 10^{-4}$	

Γ_{48}	$\omega f_0(980)$	$(1.4 \pm 0.5) \times 10^{-4}$	
Γ_{49}	$\rho\eta'(958)$	$(1.05 \pm 0.18) \times 10^{-4}$	
Γ_{50}	$\rho\bar{\rho}\phi$	$(4.5 \pm 1.5) \times 10^{-5}$	
Γ_{51}	$a_2(1320)^\pm \pi^\mp$	$[a] < 4.3 \times 10^{-3}$	CL=90%
Γ_{52}	$K\bar{K}_2^*(1430) + \text{c.c.}$	$< 4.0 \times 10^{-3}$	CL=90%
Γ_{53}	$K_1(1270)^\pm K^\mp$	$< 3.0 \times 10^{-3}$	CL=90%
Γ_{54}	$K_2^*(1430)^0 \bar{K}_2^*(1430)^0$	$< 2.9 \times 10^{-3}$	CL=90%
Γ_{55}	$K^*(892)^0 \bar{K}^*(892)^0$	$< 5 \times 10^{-4}$	CL=90%
Γ_{56}	$\phi f_2(1270)$	$< 3.7 \times 10^{-4}$	CL=90%
Γ_{57}	$\rho\bar{\rho}\rho$	$< 3.1 \times 10^{-4}$	CL=90%
Γ_{58}	$\phi\eta(1405) \rightarrow \phi\eta\pi\pi$	$< 2.5 \times 10^{-4}$	CL=90%
Γ_{59}	$\omega f_2'(1525)$	$< 2.2 \times 10^{-4}$	CL=90%
Γ_{60}	$\Sigma(1385)^0 \bar{\Lambda}$	$< 2 \times 10^{-4}$	CL=90%
Γ_{61}	$\Delta(1232)^+ \bar{p}$	$< 1 \times 10^{-4}$	CL=90%
Γ_{62}	$\Theta(1540) \bar{\Theta}(1540) \rightarrow$ $K_S^0 p K^- \bar{n} + \text{c.c.}$	$< 1.1 \times 10^{-5}$	CL=90%
Γ_{63}	$\Theta(1540) K^- \bar{n} \rightarrow K_S^0 p K^- \bar{n}$	$< 2.1 \times 10^{-5}$	CL=90%
Γ_{64}	$\Theta(1540) K_S^0 \bar{p} \rightarrow K_S^0 \bar{p} K^+ n$	$< 1.6 \times 10^{-5}$	CL=90%
Γ_{65}	$\bar{\Theta}(1540) K^+ n \rightarrow K_S^0 \bar{p} K^+ n$	$< 5.6 \times 10^{-5}$	CL=90%
Γ_{66}	$\bar{\Theta}(1540) K_S^0 p \rightarrow K_S^0 p K^- \bar{n}$	$< 1.1 \times 10^{-5}$	CL=90%
Γ_{67}	$\Sigma^0 \bar{\Lambda}$	$< 9 \times 10^{-5}$	CL=90%
Γ_{68}	$\phi\pi^0$	$< 6.4 \times 10^{-6}$	CL=90%

Decays into stable hadrons

Γ_{69}	$2(\pi^+ \pi^-) \pi^0$	$(3.37 \pm 0.26) \%$	
Γ_{70}	$3(\pi^+ \pi^-) \pi^0$	$(2.9 \pm 0.6) \%$	
Γ_{71}	$\pi^+ \pi^- \pi^0$	$(2.02 \pm 0.14) \%$	S=1.7
Γ_{72}	$\pi^+ \pi^- \pi^0 K^+ K^-$	$(1.20 \pm 0.30) \%$	
Γ_{73}	$4(\pi^+ \pi^-) \pi^0$	$(9.0 \pm 3.0) \times 10^{-3}$	
Γ_{74}	$\pi^+ \pi^- K^+ K^-$	$(6.2 \pm 0.7) \times 10^{-3}$	
Γ_{75}	$K\bar{K}\pi$	$(6.1 \pm 1.0) \times 10^{-3}$	
Γ_{76}	$\rho\bar{\rho}\pi^+ \pi^-$	$(6.0 \pm 0.5) \times 10^{-3}$	S=1.3
Γ_{77}	$2(\pi^+ \pi^-)$	$(3.55 \pm 0.23) \times 10^{-3}$	
Γ_{78}	$3(\pi^+ \pi^-)$	$(4.3 \pm 0.4) \times 10^{-3}$	
Γ_{79}	$2(\pi^+ \pi^- \pi^0)$	$(1.62 \pm 0.21) \%$	
Γ_{80}	$2(\pi^+ \pi^-) \eta$	$(2.26 \pm 0.28) \times 10^{-3}$	
Γ_{81}	$3(\pi^+ \pi^-) \eta$	$(7.2 \pm 1.5) \times 10^{-4}$	
Γ_{82}	$n\bar{n}\pi^+ \pi^-$	$(4 \pm 4) \times 10^{-3}$	
Γ_{83}	$\Sigma^0 \bar{\Sigma}^0$	$(1.31 \pm 0.10) \times 10^{-3}$	
Γ_{84}	$2(\pi^+ \pi^-) K^+ K^-$	$(4.7 \pm 0.7) \times 10^{-3}$	S=1.3
Γ_{85}	$\rho\bar{\rho}\pi^+ \pi^- \pi^0$	$[b] (2.3 \pm 0.9) \times 10^{-3}$	S=1.9
Γ_{86}	$\rho\bar{\rho}$	$(2.17 \pm 0.08) \times 10^{-3}$	
Γ_{87}	$\rho\bar{\rho}\eta$	$(2.09 \pm 0.18) \times 10^{-3}$	

Γ_{88}	$p\bar{n}\pi^-$	$(2.00 \pm 0.10) \times 10^{-3}$	
Γ_{89}	$n\bar{n}$	$(2.2 \pm 0.4) \times 10^{-3}$	
Γ_{90}	$\Xi\bar{\Xi}$	$(1.8 \pm 0.4) \times 10^{-3}$	S=1.8
Γ_{91}	$\Lambda\bar{\Lambda}$	$(1.54 \pm 0.19) \times 10^{-3}$	S=2.2
Γ_{92}	$p\bar{p}\pi^0$	$(1.09 \pm 0.09) \times 10^{-3}$	
Γ_{93}	$\Lambda\bar{\Sigma}^-\pi^+$ (or c.c.)	[a] $(1.06 \pm 0.12) \times 10^{-3}$	
Γ_{94}	$pK^-\bar{\Lambda}$	$(8.9 \pm 1.6) \times 10^{-4}$	
Γ_{95}	$2(K^+K^-)$	$(7.8 \pm 1.4) \times 10^{-4}$	
Γ_{96}	$pK^-\bar{\Sigma}^0$	$(2.9 \pm 0.8) \times 10^{-4}$	
Γ_{97}	K^+K^-	$(2.37 \pm 0.31) \times 10^{-4}$	
Γ_{98}	$K_S^0 K_L^0$	$(1.46 \pm 0.26) \times 10^{-4}$	S=2.7
Γ_{99}	$\Lambda\bar{\Lambda}\pi^0$	$(2.2 \pm 0.6) \times 10^{-4}$	
Γ_{100}	$\pi^+\pi^-$	$(1.47 \pm 0.23) \times 10^{-4}$	
Γ_{101}	$\Lambda\bar{\Sigma} + \text{c.c.}$	$< 1.5 \times 10^{-4}$	CL=90%
Γ_{102}	$K_S^0 K_S^0$	$< 1 \times 10^{-6}$	CL=95%

Radiative decays

Γ_{103}	$\gamma\eta_c(1S)$	$(1.3 \pm 0.4) \%$	
Γ_{104}	$\gamma\pi^+\pi^-2\pi^0$	$(8.3 \pm 3.1) \times 10^{-3}$	
Γ_{105}	$\gamma\eta\pi\pi$	$(6.1 \pm 1.0) \times 10^{-3}$	
Γ_{106}	$\gamma\eta(1405/1475) \rightarrow \gamma K\bar{K}\pi$	[c] $(2.8 \pm 0.6) \times 10^{-3}$	S=1.6
Γ_{107}	$\gamma\eta(1405/1475) \rightarrow \gamma\gamma\rho^0$	$(7.8 \pm 2.0) \times 10^{-6}$	S=1.8
Γ_{108}	$\gamma\eta(1405/1475) \rightarrow \gamma\eta\pi^+\pi^-$	$(3.0 \pm 0.5) \times 10^{-4}$	
Γ_{109}	$\gamma\eta(1405/1475) \rightarrow \gamma\gamma\phi$	$< 8.2 \times 10^{-5}$	CL=95%
Γ_{110}	$\gamma\rho\rho$	$(4.5 \pm 0.8) \times 10^{-3}$	
Γ_{111}	$\gamma\eta_2(1870) \rightarrow \gamma\pi^+\pi^-$	$(6.2 \pm 2.4) \times 10^{-4}$	
Γ_{112}	$\gamma\eta'(958)$	$(4.71 \pm 0.27) \times 10^{-3}$	S=1.1
Γ_{113}	$\gamma 2\pi^+ 2\pi^-$	$(2.8 \pm 0.5) \times 10^{-3}$	S=1.9
Γ_{114}	$\gamma f_2(1270)f_2(1270)$	$(9.5 \pm 1.7) \times 10^{-4}$	
Γ_{115}	$\gamma f_2(1270)f_2(1270)$ (non resonant)	$(8.2 \pm 1.9) \times 10^{-4}$	
Γ_{116}	$\gamma K^+K^-\pi^+\pi^-$	$(2.1 \pm 0.6) \times 10^{-3}$	
Γ_{117}	$\gamma f_4(2050)$	$(2.7 \pm 0.7) \times 10^{-3}$	
Γ_{118}	$\gamma\omega\omega$	$(1.59 \pm 0.33) \times 10^{-3}$	
Γ_{119}	$\gamma\eta(1405/1475) \rightarrow \gamma\rho^0\rho^0$	$(1.7 \pm 0.4) \times 10^{-3}$	S=1.3
Γ_{120}	$\gamma f_2(1270)$	$(1.38 \pm 0.14) \times 10^{-3}$	
Γ_{121}	$\gamma f_0(1710) \rightarrow \gamma K\bar{K}$	$(8.5^{+1.2}_{-0.9}) \times 10^{-4}$	S=1.2
Γ_{122}	$\gamma f_0(1710) \rightarrow \gamma\pi\pi$		
Γ_{123}	$\gamma\eta$	$(9.8 \pm 1.0) \times 10^{-4}$	S=1.7
Γ_{124}	$\gamma f_1(1420) \rightarrow \gamma K\bar{K}\pi$	$(7.9 \pm 1.3) \times 10^{-4}$	
Γ_{125}	$\gamma f_1(1285)$	$(6.1 \pm 0.8) \times 10^{-4}$	
Γ_{126}	$\gamma f_1(1510) \rightarrow \gamma\eta\pi^+\pi^-$	$(4.5 \pm 1.2) \times 10^{-4}$	
Γ_{127}	$\gamma f_2'(1525)$	$(4.5^{+0.7}_{-0.4}) \times 10^{-4}$	

$\Gamma_{128} \gamma f_2(1950) \rightarrow \gamma K^*(892) \bar{K}^*(892)$	$(7.0 \pm 2.2) \times 10^{-4}$	
$\Gamma_{129} \gamma K^*(892) \bar{K}^*(892)$	$(4.0 \pm 1.3) \times 10^{-3}$	
$\Gamma_{130} \gamma \phi \phi$	$(4.0 \pm 1.2) \times 10^{-4}$	S=2.1
$\Gamma_{131} \gamma p \bar{p}$	$(3.8 \pm 1.0) \times 10^{-4}$	
$\Gamma_{132} \gamma \eta(2225)$	$(2.9 \pm 0.6) \times 10^{-4}$	
$\Gamma_{133} \gamma \eta(1760) \rightarrow \gamma \rho^0 \rho^0$	$(1.3 \pm 0.9) \times 10^{-4}$	
$\Gamma_{134} \gamma X(1835)$	$(2.2 \pm 0.6) \times 10^{-4}$	
$\Gamma_{135} \gamma (K \bar{K} \pi)_{JPC=0-+}$	$(7 \pm 4) \times 10^{-4}$	S=2.1
$\Gamma_{136} \gamma \pi^0$	$(3.3^{+0.6}_{-0.4}) \times 10^{-5}$	
$\Gamma_{137} \gamma p \bar{p} \pi^+ \pi^-$	$< 7.9 \times 10^{-4}$	CL=90%
$\Gamma_{138} \gamma \gamma$	$< 5 \times 10^{-4}$	CL=90%
$\Gamma_{139} \gamma \Lambda \bar{\Lambda}$	$< 1.3 \times 10^{-4}$	CL=90%
$\Gamma_{140} 3\gamma$	$< 5.5 \times 10^{-5}$	CL=90%
$\Gamma_{141} \gamma f_0(2200)$		
$\Gamma_{142} \gamma f_J(2220)$	$> 2.50 \times 10^{-3}$	CL=99.9%
$\Gamma_{143} \gamma f_J(2220) \rightarrow \gamma \pi \pi$	$(8 \pm 4) \times 10^{-5}$	
$\Gamma_{144} \gamma f_J(2220) \rightarrow \gamma K \bar{K}$	$(8.1 \pm 3.0) \times 10^{-5}$	
$\Gamma_{145} \gamma f_J(2220) \rightarrow \gamma p \bar{p}$	$(1.5 \pm 0.8) \times 10^{-5}$	
$\Gamma_{146} \gamma f_0(1500)$	$> (5.7 \pm 0.8) \times 10^{-4}$	
$\Gamma_{147} \gamma e^+ e^-$	$(8.8 \pm 1.4) \times 10^{-3}$	

Lepton Family number (LF) violating modes

$\Gamma_{148} e^\pm \mu^\mp$	LF	$< 1.1 \times 10^{-6}$	CL=90%
$\Gamma_{149} e^\pm \tau^\mp$	LF	$< 8.3 \times 10^{-6}$	CL=90%
$\Gamma_{150} \mu^\pm \tau^\mp$	LF	$< 2.0 \times 10^{-6}$	CL=90%

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

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

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

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

$\Gamma(\text{hadrons})$			Γ_1
VALUE (keV)	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
74.1 ± 8.1	BAI	95B BES	$e^+ e^-$
59 ± 24	BALDINI-...	75 FRAG	$e^+ e^-$
59 ± 14	BOYARSKI	75 MRK1	$e^+ e^-$
50 ± 25	ESPOSITO	75B FRAM	$e^+ e^-$

$\Gamma(e^+e^-)$ Γ_3

VALUE (keV)	EVTs	DOCUMENT ID	TECN	COMMENT
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5.55±0.14±0.02 OUR EVALUATION

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

5.71±0.16	13k	⁷ ADAMS	06A CLEO	$e^+e^- \rightarrow \mu^+\mu^-\gamma$
5.57±0.19	7.8k	⁷ AUBERT	04 BABR	$e^+e^- \rightarrow \mu^+\mu^-\gamma$
5.14±0.39		BAI	95B BES	e^+e^-
5.36 ^{+0.29} _{-0.28}		⁸ HSUEH	92 RVUE	See Υ mini-review
4.72±0.35		ALEXANDER	89 RVUE	See Υ mini-review
4.4 ±0.6		⁸ BRANDELIK	79C DASP	e^+e^-
4.6 ±0.8		⁹ BALDINI-...	75 FRAG	e^+e^-
4.8 ±0.6		BOYARSKI	75 MRK1	e^+e^-
4.6 ±1.0		ESPOSITO	75B FRAM	e^+e^-

⁷ Calculated by us from the reported values of $\Gamma(e^+e^-) \times B(\mu^+\mu^-)$ using $B(\mu^+\mu^-) = (5.93 \pm 0.06)\%$.

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

⁹ Assuming equal partial widths for e^+e^- and $\mu^+\mu^-$.

 $\Gamma(\mu^+\mu^-)$ Γ_4

VALUE (keV)	DOCUMENT ID	TECN	COMMENT
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• • • 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_{138}

VALUE (eV)	CL%	DOCUMENT ID	TECN	COMMENT
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<5.4	90	BRANDELIK	79C DASP	e^+e^-
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 $J/\psi(1S) \Gamma(i)\Gamma(e^+e^-)/\Gamma(\text{total})$

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.

 $\Gamma(\text{hadrons}) \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$ $\Gamma_1\Gamma_3/\Gamma$

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

4 ±0.8	¹¹ BALDINI-...	75 FRAG	e^+e^-
3.9±0.8	¹¹ ESPOSITO	75B FRAM	e^+e^-

$$\Gamma(e^+e^-) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_3\Gamma_3/\Gamma$$

VALUE (keV)	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.35 ± 0.02	BRANDELIK	79C DASP	e^+e^-
0.32 ± 0.07	¹¹ BALDINI-...	75 FRAG	e^+e^-
0.34 ± 0.09	¹¹ ESPOSITO	75B FRAM	e^+e^-
0.36 ± 0.10	¹¹ FORD	75 SPEC	e^+e^-

$$\Gamma(\mu^+\mu^-) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_4\Gamma_3/\Gamma$$

VALUE (keV)	EVTS	DOCUMENT ID	TECN	COMMENT
0.335 ± 0.007 OUR AVERAGE				
$0.3384 \pm 0.0058 \pm 0.0071$	13k	ADAMS	06A CLEO	$e^+e^- \rightarrow \mu^+\mu^-\gamma$
$0.3301 \pm 0.0077 \pm 0.0073$	7.8k	AUBERT	04 BABR	$e^+e^- \rightarrow \mu^+\mu^-\gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.51 ± 0.09		DASP	75 DASP	e^+e^-
0.38 ± 0.05		¹¹ ESPOSITO	75B FRAM	e^+e^-

$$\Gamma(\omega\pi^+\pi^0) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_9\Gamma_3/\Gamma$$

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

$$\Gamma(\phi 2(\pi^+\pi^-)) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_{24}\Gamma_3/\Gamma$$

VALUE (10^{-2} keV)	EVTS	DOCUMENT ID	TECN	COMMENT
0.96 ± 0.19 ± 0.01	35	¹⁰ AUBERT	06D BABR	$10.6 e^+e^- \rightarrow \phi 2(\pi^+\pi^-)\gamma$
¹⁰ AUBERT 06D reports $[\Gamma(J/\psi \rightarrow e^+e^-) B(\psi(2S) \rightarrow \phi 2(\pi^+\pi^-))] \times B(\phi(1020) \rightarrow K^+K^-) = (0.47 \pm 0.09 \pm 0.03) \times 10^{-2}$ keV. We divide by our best value $B(\phi(1020) \rightarrow K^+K^-) = (49.2 \pm 0.6) \times 10^{-2}$. Our first error is the total experiment's error and our second error is the systematic error from using our best value.				

$$\Gamma(\pi^+\pi^-\pi^0) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_{71}\Gamma_3/\Gamma$$

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

$$\Gamma(2(\pi^+\pi^-)) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_{77}\Gamma_3/\Gamma$$

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

$$\Gamma(\pi^+\pi^-K^+K^-) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_{74}\Gamma_3/\Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
33.6 ± 2.7 ± 2.7	233	AUBERT	05D BABR	$10.6 e^+e^- \rightarrow K^+K^-\pi^+\pi^-\gamma$

$$\Gamma(2(K^+K^-)) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_{95}\Gamma_3/\Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
4.0 ± 0.7 ± 0.6	38	AUBERT	05D BABR	$10.6 e^+e^- \rightarrow 2(K^+K^-)\gamma$

$$\Gamma(3(\pi^+\pi^-)) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_{78}\Gamma_3/\Gamma$$

VALUE (10^{-2} keV)	EVTS	DOCUMENT ID	TECN	COMMENT
2.37\pm0.16\pm0.14	496	AUBERT	06D BABR	10.6 $e^+e^- \rightarrow 3(\pi^+\pi^-)\gamma$

$$\Gamma(2(\pi^+\pi^-\pi^0)) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_{79}\Gamma_3/\Gamma$$

VALUE (10^{-2} keV)	EVTS	DOCUMENT ID	TECN	COMMENT
8.9\pm0.5\pm1.0	761	AUBERT	06D BABR	10.6 $e^+e^- \rightarrow 2(\pi^+\pi^-\pi^0)\gamma$

$$\Gamma(2(\pi^+\pi^-)K^+K^-) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_{84}\Gamma_3/\Gamma$$

VALUE (10^{-2} keV)	EVTS	DOCUMENT ID	TECN	COMMENT
2.75\pm0.23\pm0.17	205	AUBERT	06D BABR	10.6 $e^+e^- \rightarrow K^+K^-2(\pi^+\pi^-)\gamma$

$$\Gamma(p\bar{p}) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_{86}\Gamma_3/\Gamma$$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
11.6\pm0.9 OUR AVERAGE	Error includes scale factor of 1.2.			
12.0 \pm 0.6 \pm 0.5	438	AUBERT	06B	$e^+e^- \rightarrow p\bar{p}\gamma$
9.7 \pm 1.7		¹² ARMSTRONG	93B E760	$\bar{p}p \rightarrow e^+e^-$

¹¹ Data redundant with branching ratios or partial widths above.

¹² Using $\Gamma_{\text{total}} = 85.5^{+6.1}_{-5.8}$ MeV.

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

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

$$\Gamma(\text{hadrons})/\Gamma_{\text{total}} \quad \Gamma_1/\Gamma$$

VALUE	DOCUMENT ID	TECN	COMMENT
0.877\pm0.005 OUR AVERAGE			
0.878 \pm 0.005	BAI	95B BES	e^+e^-
0.86 \pm 0.02	BOYARSKI	75 MRK1	e^+e^-

$$\Gamma(\text{virtual}\gamma \rightarrow \text{hadrons})/\Gamma_{\text{total}} \quad \Gamma_2/\Gamma$$

VALUE	DOCUMENT ID	TECN	COMMENT
0.135\pm0.003	^{13,14} SETH	04 RVUE	e^+e^-
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.17 \pm 0.02	¹³ BOYARSKI	75 MRK1	e^+e^-

¹³ Included in $\Gamma(\text{hadrons})/\Gamma_{\text{total}}$.

¹⁴ 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.

$$\Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_3/\Gamma$$

VALUE (units 10^{-2})	EVTS	DOCUMENT ID	TECN	COMMENT
5.94 \pm0.06 OUR AVERAGE				
5.945 \pm 0.067 \pm 0.042	15k	LI	05C CLEO	$\psi(2S) \rightarrow J/\psi\pi^+\pi^-$
5.90 \pm 0.05 \pm 0.10		BAI	98D BES	$\psi(2S) \rightarrow J/\psi\pi^+\pi^-$
6.09 \pm 0.33		BAI	95B BES	e^+e^-
5.92 \pm 0.15 \pm 0.20		COFFMAN	92 MRK3	$\psi(2S) \rightarrow J/\psi\pi^+\pi^-$
6.9 \pm 0.9		BOYARSKI	75 MRK1	e^+e^-

$\Gamma(\mu^+\mu^-)/\Gamma_{\text{total}}$ Γ_4/Γ

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

 $\Gamma(e^+e^-)/\Gamma(\mu^+\mu^-)$ Γ_3/Γ_4

VALUE	DOCUMENT ID	TECN	COMMENT
0.997 \pm 0.012 \pm 0.006	LI	05C CLEO	$\psi(2S) \rightarrow J/\psi \pi^+ \pi^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
1.00 \pm 0.07	BAI	95B BES	$e^+ e^-$
1.00 \pm 0.05	BOYARSKI	75 MRK1	$e^+ e^-$
0.91 \pm 0.15	ESPOSITO	75B FRAM	$e^+ e^-$
0.93 \pm 0.10	FORD	75 SPEC	$e^+ e^-$

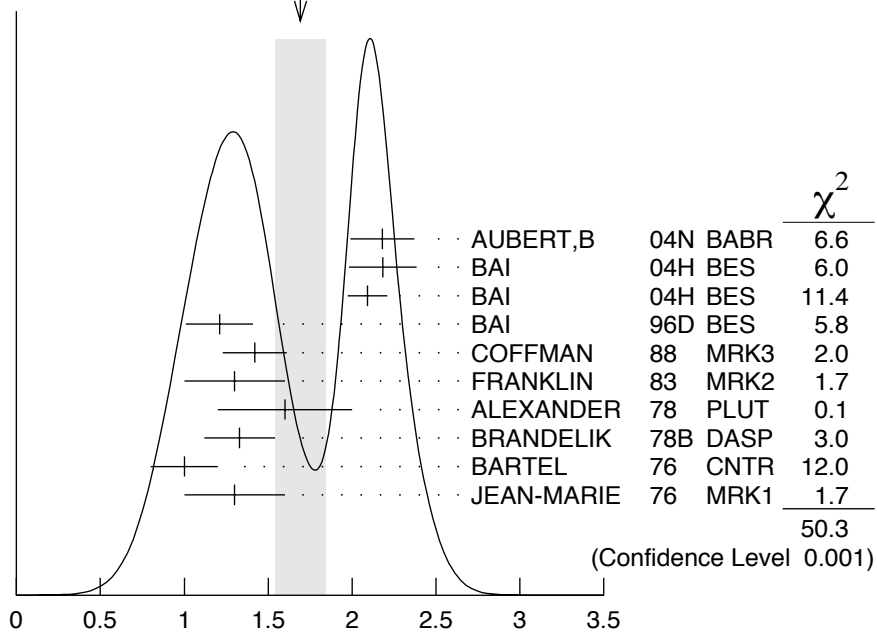
HADRONIC DECAYS

 $\Gamma(\rho\pi)/\Gamma_{\text{total}}$ Γ_5/Γ

VALUE (units 10^{-2})	EVTS	DOCUMENT ID	TECN	COMMENT
1.69 \pm 0.15				OUR AVERAGE
		Error includes scale factor of 2.4. See the ideogram below.		
2.18 \pm 0.19		15,16 AUBERT,B	04N BABR	$10.6 e^+ e^- \rightarrow \pi^+ \pi^- \pi^0 \gamma$
2.184 \pm 0.005 \pm 0.201	220k	16,17 BAI	04H BES	$e^+ e^- \rightarrow J/\psi \rightarrow \pi^+ \pi^- \pi^0$
2.091 \pm 0.021 \pm 0.116		16,18 BAI	04H BES	$\psi(2S) \rightarrow \pi^+ \pi^- J/\psi$
1.21 \pm 0.20		BAI	96D BES	$e^+ e^- \rightarrow \rho \pi$
1.42 \pm 0.01 \pm 0.19		COFFMAN	88 MRK3	$e^+ e^-$
1.3 \pm 0.3	150	FRANKLIN	83 MRK2	$e^+ e^-$
1.6 \pm 0.4	183	ALEXANDER	78 PLUT	$e^+ e^-$
1.33 \pm 0.21		BRANDELIK	78B DASP	$e^+ e^-$
1.0 \pm 0.2	543	BARTEL	76 CNTR	$e^+ e^-$
1.3 \pm 0.3	153	JEAN-MARIE	76 MRK1	$e^+ e^-$

¹⁵ From the ratio of $\Gamma(e^+e^-) B(\pi^+\pi^-\pi^0)$ and $\Gamma(e^+e^-) B(\mu^+\mu^-)$ (AUBERT 04).¹⁶ Not independent of their $B(\pi^+\pi^-\pi^0)$.¹⁷ From $J/\psi \rightarrow \pi^+\pi^-\pi^0$ events directly.¹⁸ 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 $B(J/\psi \rightarrow \mu^+\mu^-) = 5.88 \pm 0.10\%$.

WEIGHTED AVERAGE
 1.69 ± 0.15 (Error scaled by 2.4)



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

Γ_5/Γ

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

Γ_6/Γ_5

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_7/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	$e^+e^- \rightarrow 2(\pi^+\pi^-)\pi^0$

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

Γ_8/Γ

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

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

Γ_9/Γ

VALUE (units 10^{-2})	EVTS	DOCUMENT ID	TECN	COMMENT
$0.40 \pm 0.06 \pm 0.04$	170	35 AUBERT	06D BABR	$10.6 e^+e^- \rightarrow \omega\pi^+\pi^-\pi^0\gamma$

$\Gamma(\omega\pi^+\pi^-)/\Gamma_{\text{total}}$ Γ_{10}/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	$e^+e^- \rightarrow 2(\pi^+\pi^-)\pi^0$

 $\Gamma(\omega\pi^+\pi^-)/\Gamma(2(\pi^+\pi^-)\pi^0)$ Γ_{10}/Γ_{69}

VALUE	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.3	¹⁹ JEAN-MARIE	76 MRK1	e^+e^-

¹⁹ Final state $(\pi^+\pi^-)\pi^0$ under the assumption that $\pi\pi$ is isospin 0.

 $\Gamma(K^*(892)^0\bar{K}_2^*(1430)^0 + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{12}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
67 ± 26	40	VANNUCCI	77 MRK1	$e^+e^- \rightarrow \pi^+\pi^- K^+ K^-$

 $\Gamma(\omega K^*(892)\bar{K} + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{13}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
$53 \pm 14 \pm 14$	530 ± 140	BECKER	87 MRK3	$e^+e^- \rightarrow \text{hadrons}$

 $\Gamma(\omega f_2(1270))/\Gamma_{\text{total}}$ Γ_{11}/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	$e^+e^- \rightarrow 2(\pi^+\pi^-)\pi^0$

 $\Gamma(K^+\bar{K}^*(892)^- + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{14}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
5.0 ± 0.4 OUR AVERAGE				
$4.57 \pm 0.17 \pm 0.70$	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	$J/\psi \rightarrow K^\pm X$

 $\Gamma(K^0\bar{K}^*(892)^0 + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{15}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
4.2 ± 0.4 OUR AVERAGE				
$3.96 \pm 0.15 \pm 0.60$	1192	JOUSSET	90 DM2	$J/\psi \rightarrow \text{hadrons}$
$4.33 \pm 0.12 \pm 0.45$		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	$J/\psi \rightarrow K^\pm K_S^0 \pi^\mp$

$$\Gamma(K^0 \bar{K}^*(892)^0 + \text{c.c.}) / \Gamma(K^+ \bar{K}^*(892)^- + \text{c.c.}) \quad \Gamma_{15}/\Gamma_{14}$$

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

$$\Gamma(K_1(1400)^\pm K^\mp) / \Gamma_{\text{total}} \quad \Gamma_{16}/\Gamma$$

VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
3.8 ± 0.8 ± 1.2	20 BAI	99C	BES $e^+ e^-$

²⁰ Assuming $B(K_1(1400) \rightarrow K^* \pi) = 0.94 \pm 0.06$

$$\Gamma(\omega \pi^0 \pi^0) / \Gamma_{\text{total}} \quad \Gamma_{17}/\Gamma$$

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

$$\Gamma(b_1(1235)^\pm \pi^\mp) / \Gamma_{\text{total}} \quad \Gamma_{18}/\Gamma$$

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

$$\Gamma(\omega K^\pm K_S^0 \pi^\mp) / \Gamma_{\text{total}} \quad \Gamma_{19}/\Gamma$$

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
29.5 ± 1.4 ± 7.0	879 ± 41	BECKER	87	MRK3 $e^+ e^- \rightarrow \text{hadrons}$

$$\Gamma(b_1(1235)^0 \pi^0) / \Gamma_{\text{total}} \quad \Gamma_{20}/\Gamma$$

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

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

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
20.4 ± 2.8 OUR AVERAGE				
20.7 ± 2.4 ± 3.0		FALVARD	88	DM2 $J/\psi \rightarrow \text{hadrons}$
20 ± 3 ± 3	155 ± 20	BECKER	87	MRK3 $e^+ e^- \rightarrow \text{hadrons}$

$$\Gamma(\omega K \bar{K}) / \Gamma_{\text{total}} \quad \Gamma_{22}/\Gamma$$

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
19 ± 4 OUR AVERAGE				
19.8 ± 2.1 ± 3.9		²¹ FALVARD	88	DM2 $J/\psi \rightarrow \text{hadrons}$
16 ± 10	22	FELDMAN	77	MRK1 $e^+ e^-$

²¹ Addition of $\omega K^+ K^-$ and $\omega K^0 \bar{K}^0$ branching ratios.

$$\Gamma(\omega f_0(1710) \rightarrow \omega K \bar{K}) / \Gamma_{\text{total}} \quad \Gamma_{23}/\Gamma$$

VALUE (units 10^{-4})	DOCUMENT ID	TECN	COMMENT
4.8 ± 1.1 ± 0.3	22,23 FALVARD	88	DM2 $J/\psi \rightarrow \text{hadrons}$

²² Includes unknown branching fraction $f_0(1710) \rightarrow K \bar{K}$.

²³ Addition of $f_0(1710) \rightarrow K^+ K^-$ and $f_0(1710) \rightarrow K^0 \bar{K}^0$ branching ratios.

$\Gamma(\phi 2(\pi^+ \pi^-))/\Gamma_{\text{total}}$ Γ_{24}/Γ

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

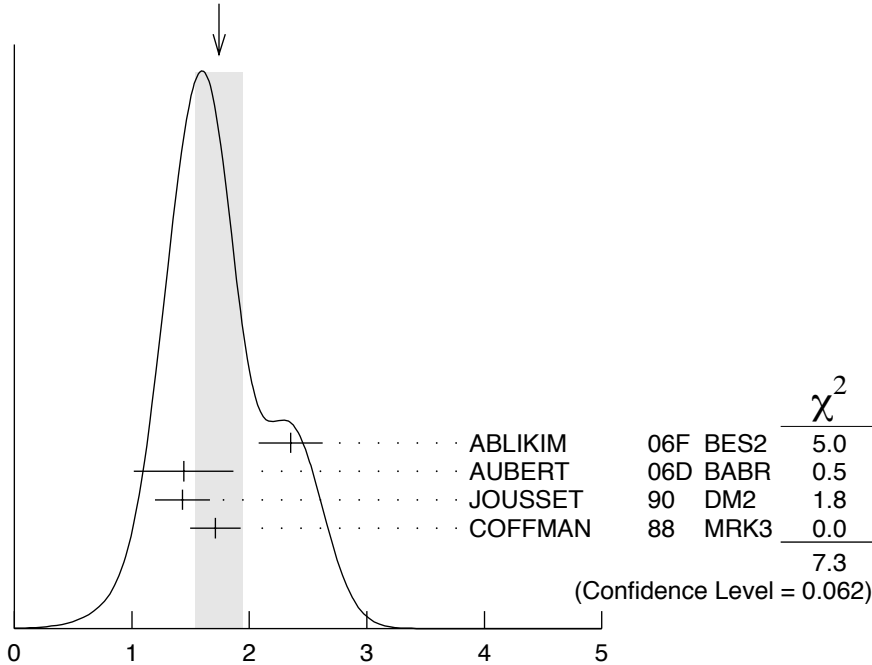
$\Gamma(\Delta(1232)^{++} \bar{p} \pi^-)/\Gamma_{\text{total}}$ Γ_{25}/Γ

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

$\Gamma(\omega \eta)/\Gamma_{\text{total}}$ Γ_{26}/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	^{36,37} ABLIKIM	06F BES2	$J/\psi \rightarrow \omega \eta$
$1.44 \pm 0.40 \pm 0.14$	13	³⁵ AUBERT	06D BABR	$10.6 e^+ e^- \rightarrow \omega \eta \gamma$
$1.43 \pm 0.10 \pm 0.21$	378	JOUSSET	90 DM2	$J/\psi \rightarrow \text{hadrons}$
$1.71 \pm 0.08 \pm 0.20$		COFFMAN	88 MRK3	$e^+ e^- \rightarrow 3\pi \eta$

WEIGHTED AVERAGE
 1.74 ± 0.20 (Error scaled by 1.6)

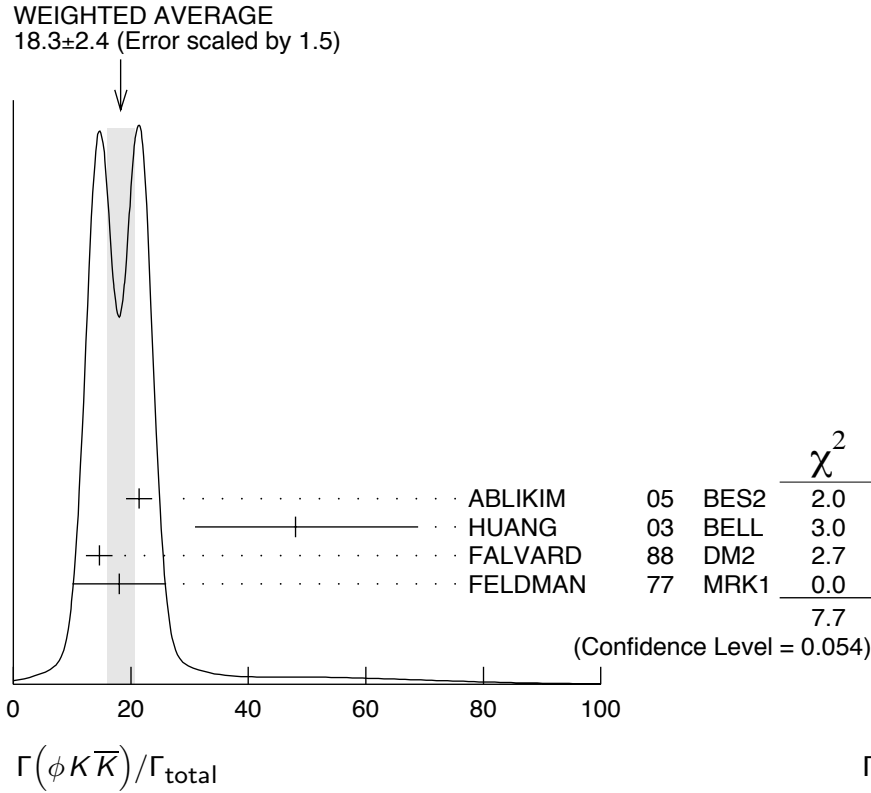


$\Gamma(\omega \eta)/\Gamma_{\text{total}}$ Γ_{26}/Γ

$\Gamma(\phi K \bar{K})/\Gamma_{\text{total}}$ Γ_{27}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
18.3 ± 2.4 OUR AVERAGE		Error includes scale factor of 1.5. See the ideogram below.		
$21.4 \pm 0.4 \pm 2.2$		ABLIKIM	05 BES2	$J/\psi \rightarrow \phi \pi^+ \pi^-$
$48 \pm 20 \pm 6$	9.0 ± 3.7	^{38,39} HUANG	03 BELL	$B^+ \rightarrow (\phi K^+ K^-) K^+$
$14.6 \pm 0.8 \pm 2.1$		²⁴ FALVARD	88 DM2	$J/\psi \rightarrow \text{hadrons}$
18 ± 8	14	FELDMAN	77 MRK1	$e^+ e^-$

²⁴ 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_{28}/Γ

VALUE (units 10^{-4})		DOCUMENT ID	TECN	COMMENT
3.6±0.2±0.6	25,26	FALVARD	88 DM2	$J/\psi \rightarrow \text{hadrons}$

²⁵ Including interference with $f_2'(1525)$.

²⁶ Includes unknown branching fraction $f_0(1710) \rightarrow K \bar{K}$.

$\Gamma(p \bar{p} \omega)/\Gamma_{\text{total}}$ Γ_{29}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
1.30±0.25 OUR AVERAGE	Error includes scale factor of 1.3.			
1.10±0.17±0.18	486	EATON	84 MRK2	$e^+ e^-$
1.6 ±0.3	77	PERUZZI	78 MRK1	$e^+ e^-$

$\Gamma(\Delta(1232)^{++} \bar{\Delta}(1232)^{--})/\Gamma_{\text{total}}$ Γ_{30}/Γ

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

$\Gamma(\Sigma(1385)^- \bar{\Sigma}(1385)^+ (\text{or c.c.}))/\Gamma_{\text{total}}$ Γ_{31}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
1.03±0.13 OUR AVERAGE				
1.00±0.04±0.21	631 ± 25	HENRARD	87 DM2	$e^+ e^- \rightarrow \Sigma^{*-}$
1.19±0.04±0.25	754 ± 27	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	$e^+ e^- \rightarrow \Sigma^{*+}$

$\Gamma(p\bar{p}\eta'(958))/\Gamma_{\text{total}}$ Γ_{32}/Γ

VALUE (units 10^{-3})	EVTs	DOCUMENT ID	TECN	COMMENT
0.9 ± 0.4 OUR AVERAGE	Error includes scale factor of 1.7.			
$0.68 \pm 0.23 \pm 0.17$	19	EATON	84	MRK2 e^+e^-
1.8 ± 0.6	19	PERUZZI	78	MRK1 e^+e^-

$\Gamma(\phi f'_2(1525))/\Gamma_{\text{total}}$ Γ_{33}/Γ

VALUE (units 10^{-4})	EVTs	DOCUMENT ID	TECN	COMMENT
8 ± 4 OUR AVERAGE	Error includes scale factor of 2.7.			
$12.3 \pm 0.6 \pm 2.0$	^{27,28}	FALVARD	88	DM2 $J/\psi \rightarrow \text{hadrons}$
4.8 ± 1.8	46	²⁷ GIDAL	81	MRK2 $J/\psi \rightarrow K^+K^-K^+K^-$

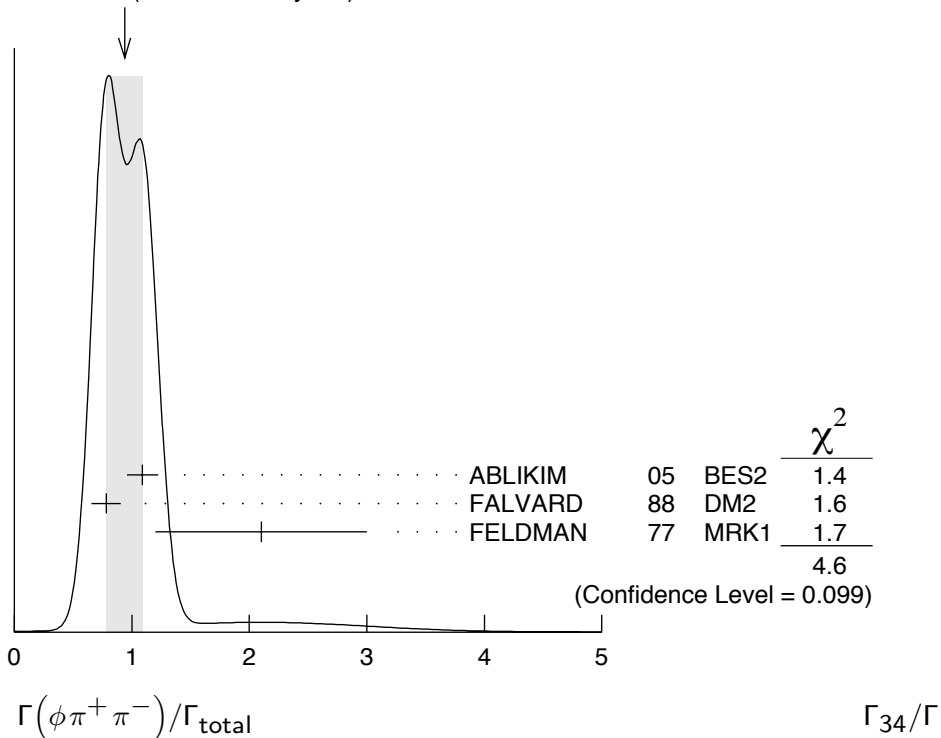
²⁷ Re-evaluated using $B(f'_2(1525) \rightarrow K\bar{K}) = 0.713$.

²⁸ Including interference with $f_0(1710)$.

$\Gamma(\phi\pi^+\pi^-)/\Gamma_{\text{total}}$ Γ_{34}/Γ

VALUE (units 10^{-3})	EVTs	DOCUMENT ID	TECN	COMMENT
0.94 ± 0.15 OUR AVERAGE	Error includes scale factor of 1.7. See the ideogram below.			
$1.09 \pm 0.02 \pm 0.13$		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^-

WEIGHTED AVERAGE
 0.94 ± 0.15 (Error scaled by 1.7)



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

Γ_{35}/Γ

VALUE (units 10^{-4}) EVTS

7.2 ± 0.9 OUR AVERAGE

$7.4 \pm 0.9 \pm 1.1$

$7 \pm 0.6 \pm 1.0$ 163 \pm 15

DOCUMENT ID

TECN

COMMENT

FALVARD

88

DM2

$J/\psi \rightarrow$ hadrons

BECKER

87

MRK3

$e^+ e^- \rightarrow$ hadrons

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

Γ_{36}/Γ

VALUE (units 10^{-4}) EVTS

$6.8^{+1.9}_{-1.6} \pm 1.7$

111 $^{+31}_{-26}$

DOCUMENT ID

TECN

COMMENT

BECKER

87

MRK3

$e^+ e^- \rightarrow$ hadrons

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

Γ_{37}/Γ

VALUE (units 10^{-3}) EVTS

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

$e^+ e^- \rightarrow J/\psi \rightarrow$ hadr

$0.64 \pm 0.04 \pm 0.11$ 346

JOUSSET

90

DM2

$J/\psi \rightarrow$ hadrons

$0.661 \pm 0.045 \pm 0.078$

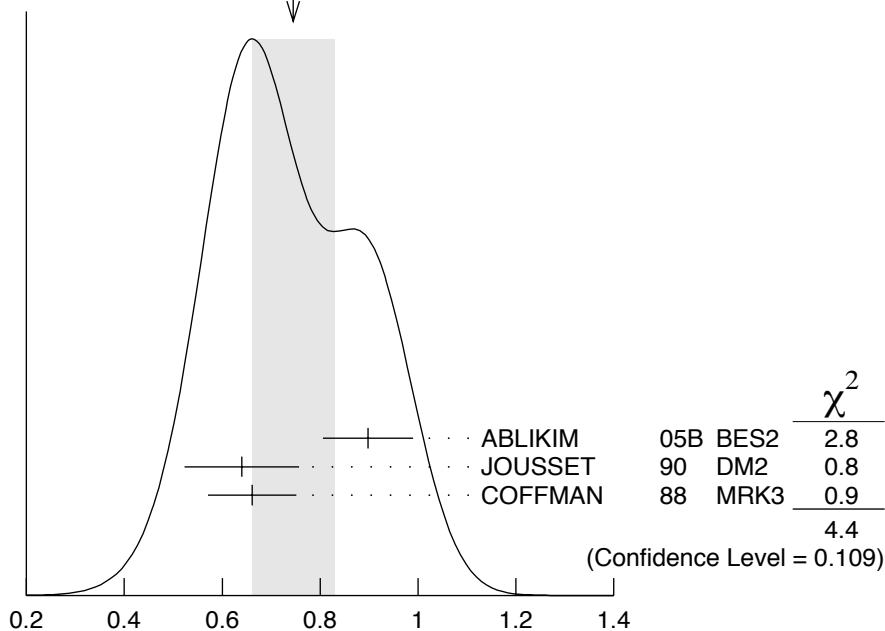
COFFMAN

88

MRK3

$e^+ e^- \rightarrow K^+ K^- \eta$

WEIGHTED AVERAGE
 0.74 ± 0.08 (Error scaled by 1.5)



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

Γ_{37}/Γ

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

Γ_{38}/Γ

VALUE (units 10^{-3}) EVTS

$0.59 \pm 0.09 \pm 0.12$

75 \pm 11

DOCUMENT ID

TECN

COMMENT

HENRARD

87

DM2

$e^+ e^-$

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

Γ_{39}/Γ

VALUE (units 10^{-3}) EVTS

$0.51 \pm 0.26 \pm 0.18$

89

DOCUMENT ID

TECN

COMMENT

EATON

84

MRK2

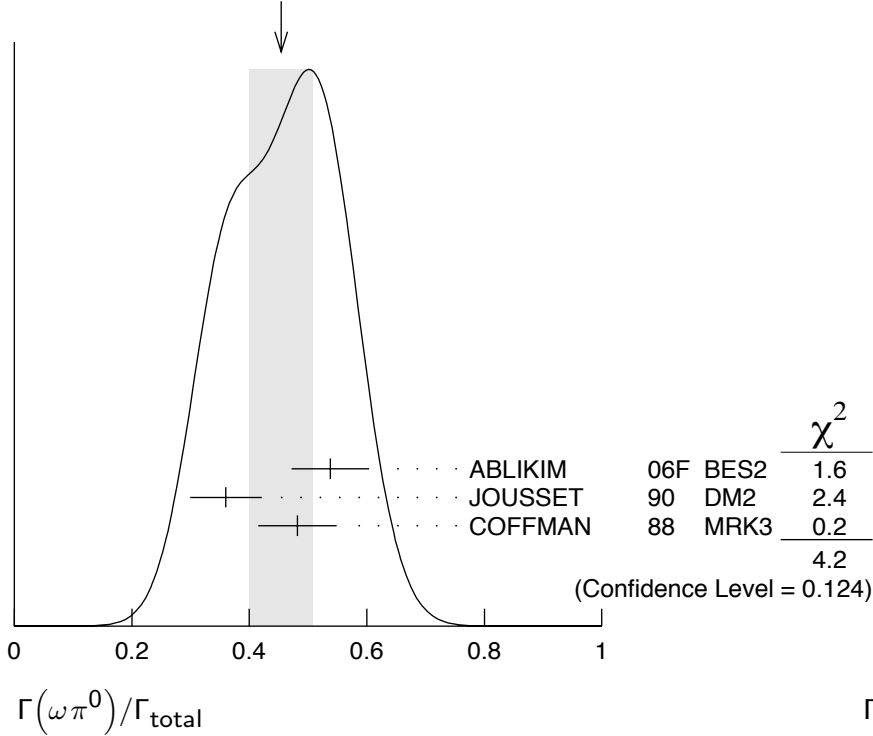
$e^+ e^-$

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

Γ_{40}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
0.45 ± 0.05 OUR AVERAGE		Error includes scale factor of 1.4. See the ideogram below.		
0.538 ± 0.012 ± 0.065	2090	37 ABLIKIM	06F BES2	$J/\psi \rightarrow \omega\pi^0$
0.360 ± 0.028 ± 0.054	222	JOUSSET	90 DM2	$J/\psi \rightarrow \text{hadrons}$
0.482 ± 0.019 ± 0.064		COFFMAN	88 MRK3	$e^+e^- \rightarrow \pi^0\pi^+\pi^-\pi^0$

WEIGHTED AVERAGE
0.45 ± 0.05 (Error scaled by 1.4)

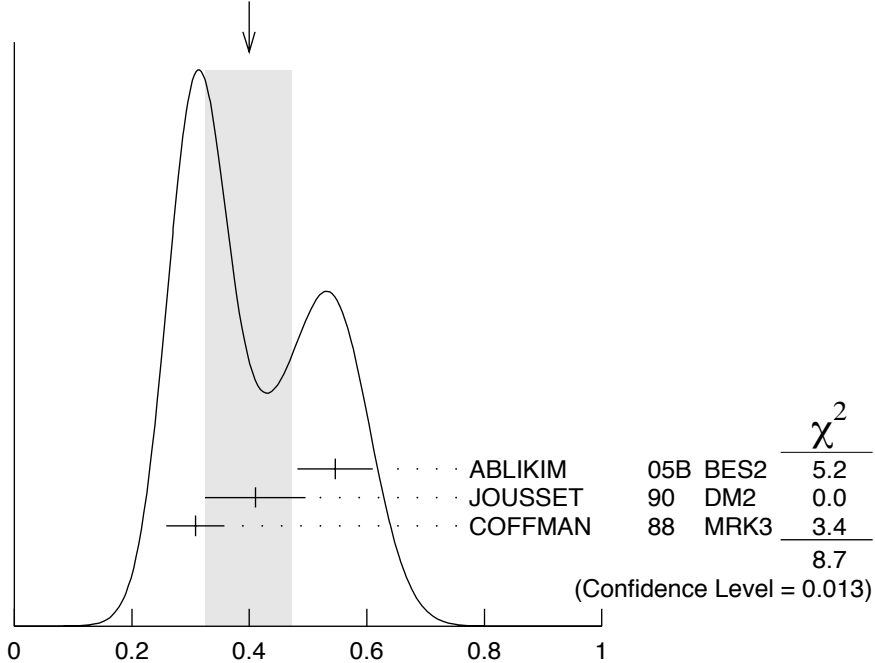


$\Gamma(\phi\eta'(958))/\Gamma_{\text{total}}$

Γ_{41}/Γ

VALUE (units 10^{-3})	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
0.40 ± 0.07 OUR AVERAGE			Error includes scale factor of 2.1. See the ideogram below.		
0.546 ± 0.031 ± 0.056			ABLIKIM	05B BES2	$e^+e^- \rightarrow J/\psi \rightarrow \text{hadr}$
0.41 ± 0.03 ± 0.08		167	JOUSSET	90 DM2	$J/\psi \rightarrow \text{hadrons}$
0.308 ± 0.034 ± 0.036			COFFMAN	88 MRK3	$e^+e^- \rightarrow K^+K^-\eta'$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
< 1.3		90	VANNUCCI	77 MRK1	e^+e^-

WEIGHTED AVERAGE
 0.40 ± 0.07 (Error scaled by 2.1)



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

Γ_{41}/Γ

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

Γ_{42}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
3.2 ± 0.9 OUR AVERAGE	Error includes scale factor of 1.9.			
$4.6 \pm 0.4 \pm 0.8$		²⁹ FALVARD	88 DM2	$J/\psi \rightarrow \text{hadrons}$
2.6 ± 0.6	50	²⁹ GIDAL	81 MRK2	$J/\psi \rightarrow K^+ K^- K^+ K^-$

²⁹ Assuming $B(f_0(980) \rightarrow \pi\pi) = 0.78$.

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

Γ_{43}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
$0.32 \pm 0.12 \pm 0.07$	24 ± 9	HENRARD	87 DM2	$e^+ e^-$

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

Γ_{44}/Γ

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

$\Gamma(\phi f_1(1285))/\Gamma_{\text{total}}$ Γ_{45}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
2.6 ± 0.5 OUR AVERAGE	Error includes scale factor of 1.1.			
$3.2 \pm 0.6 \pm 0.4$		JOUSSET	90 DM2	$J/\psi \rightarrow \phi 2(\pi^+ \pi^-)$
$2.1 \pm 0.5 \pm 0.4$	25	³⁰ JOUSSET	90 DM2	$J/\psi \rightarrow \phi \eta \pi^+ \pi^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.6 \pm 0.2 \pm 0.1$	16 ± 6	BECKER	87 MRK3	$J/\psi \rightarrow \phi K \bar{K} \pi$

³⁰ We attribute to the $f_1(1285)$ the signal observed in the $\pi^+ \pi^- \eta$ invariant mass distribution at 1297 Mev.

$\Gamma(\rho\eta)/\Gamma_{\text{total}}$ Γ_{46}/Γ

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

$\Gamma(\omega\eta'(958))/\Gamma_{\text{total}}$ Γ_{47}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
0.182 ± 0.021 OUR AVERAGE				
0.226 ± 0.043	218	^{37,40} ABLIKIM	06F BES2	$J/\psi \rightarrow \omega\eta'$
$0.18^{+0.10}_{-0.08} \pm 0.03$	6	JOUSSET	90 DM2	$J/\psi \rightarrow \text{hadrons}$
$0.166 \pm 0.017 \pm 0.019$		COFFMAN	88 MRK3	$e^+ e^- \rightarrow 3\pi\eta'$

$\Gamma(\omega f_0(980))/\Gamma_{\text{total}}$ Γ_{48}/Γ

VALUE (units 10^{-4})	DOCUMENT ID	TECN	COMMENT
$1.41 \pm 0.27 \pm 0.47$	³¹ AUGUSTIN	89 DM2	$J/\psi \rightarrow 2(\pi^+ \pi^-) \pi^0$

³¹ Assuming $B(f_0(980) \rightarrow \pi\pi) = 0.78$.

$\Gamma(\rho\eta'(958))/\Gamma_{\text{total}}$ Γ_{49}/Γ

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

$\Gamma(p\bar{p}\phi)/\Gamma_{\text{total}}$ Γ_{50}/Γ

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

$\Gamma(a_2(1320)^\pm \pi^\mp)/\Gamma_{\text{total}}$ Γ_{51}/Γ

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

$\Gamma(K\bar{K}_2^*(1430) + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{52}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID	TECN	COMMENT
<40	90	VANNUCCI	77 MRK1	$e^+ e^- \rightarrow K^0 \bar{K}_2^{*0}$

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

<66	90	BRAUNSCH...	76 DASP	$e^+ e^- \rightarrow K^\pm \bar{K}_2^{*\mp}$
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$\Gamma(K_1(1270)^\pm K^\mp)/\Gamma_{\text{total}}$ Γ_{53}/Γ

VALUE (units 10^{-3})	CL%	DOCUMENT ID	TECN	COMMENT
<3.0	90	³² BAI	99C BES	$e^+ e^-$

³² Assuming $B(K_1(1270) \rightarrow K \rho) = 0.42 \pm 0.06$ $\Gamma(K_2^*(1430)^0 \bar{K}_2^*(1430)^0)/\Gamma_{\text{total}}$ Γ_{54}/Γ

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

 $\Gamma(K^*(892)^0 \bar{K}^*(892)^0)/\Gamma_{\text{total}}$ Γ_{55}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID	TECN	COMMENT
<5	90	VANNUCCI	77 MRK1	$e^+ e^- \rightarrow \pi^+ \pi^- K^+ K^-$

 $\Gamma(\phi f_2(1270))/\Gamma_{\text{total}}$ Γ_{56}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID	TECN	COMMENT
<3.7	90	VANNUCCI	77 MRK1	$e^+ e^- \rightarrow \pi^+ \pi^- K^+ K^-$

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

<4.5	90	FALVARD	88 DM2	$J/\psi \rightarrow \text{hadrons}$
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 $\Gamma(p \bar{p} \rho)/\Gamma_{\text{total}}$ Γ_{57}/Γ

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

 $\Gamma(\phi \eta(1405) \rightarrow \phi \eta \pi \pi)/\Gamma_{\text{total}}$ Γ_{58}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID	TECN	COMMENT
<2.5	90	³³ FALVARD	88 DM2	$J/\psi \rightarrow \text{hadrons}$

³³ Includes unknown branching fraction $\eta(1405) \rightarrow \eta \pi \pi$. $\Gamma(\omega f_2'(1525))/\Gamma_{\text{total}}$ Γ_{59}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID	TECN	COMMENT
<2.2	90	³⁴ VANNUCCI	77 MRK1	$e^+ e^- \rightarrow \pi^+ \pi^- \pi^0 K^+ K^-$

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

<2.8	90	³⁴ FALVARD	88 DM2	$J/\psi \rightarrow \text{hadrons}$
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³⁴ Re-evaluated assuming $B(f_2'(1525) \rightarrow K \bar{K}) = 0.713$. $\Gamma(\Sigma(1385)^0 \bar{\Lambda})/\Gamma_{\text{total}}$ Γ_{60}/Γ

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

 $\Gamma(\Delta(1232)^+ \bar{p})/\Gamma_{\text{total}}$ Γ_{61}/Γ

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

$\Gamma(\Sigma^0 \bar{\Lambda})/\Gamma_{\text{total}}$ Γ_{67}/Γ

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

 $\Gamma(\phi \pi^0)/\Gamma_{\text{total}}$ Γ_{68}/Γ

VALUE (units 10^{-6})	CL%	DOCUMENT ID	TECN	COMMENT
<6.4	90	ABLIKIM	05B BES2	$e^+ e^- \rightarrow J/\psi \rightarrow \phi \gamma \gamma$

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

<6.8	90	COFFMAN	88 MRK3	$e^+ e^- \rightarrow K^+ K^- \pi^0$
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 $\Gamma(\Theta(1540) \bar{\Theta}(1540) \rightarrow K_S^0 p K^- \bar{n} + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{62}/Γ

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

 $\Gamma(\Theta(1540) K^- \bar{n} \rightarrow K_S^0 p K^- \bar{n})/\Gamma_{\text{total}}$ Γ_{63}/Γ

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

 $\Gamma(\Theta(1540) K_S^0 \bar{p} \rightarrow K_S^0 \bar{p} K^+ n)/\Gamma_{\text{total}}$ Γ_{64}/Γ

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

 $\Gamma(\bar{\Theta}(1540) K^+ n \rightarrow K_S^0 \bar{p} K^+ n)/\Gamma_{\text{total}}$ Γ_{65}/Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID	TECN	COMMENT
<5.6	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_{66}/Γ

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

³⁵ Using $\Gamma(J/\psi \rightarrow e^+ e^-) = 5.52 \pm 0.14 \pm 0.04$ keV.

³⁶ Using $B(\eta \rightarrow 2\gamma) = (39.43 \pm 0.26)\%$, $B(\eta \rightarrow \pi^+ \pi^- \pi^0) = 22.6 \pm 0.4\%$ and, $B(\eta \rightarrow \pi^+ \pi^- \gamma) = 4.68 \pm 0.11\%$.

³⁷ Using $B(\omega \rightarrow \pi^+ \pi^- \pi^0) = (89.1 \pm 0.7)\%$.

³⁸ We have multiplied $K^+ K^-$ measurement by 2 to obtain $K \bar{K}$.

³⁹ Using $B(B^+ \rightarrow J/\psi K^+) = (1.01 \pm 0.05) \times 10^{-3}$.

⁴⁰ Using $B(\eta' \rightarrow \pi^+ \pi^- \eta) = (44.3 \pm 1.5)\%$, $B(\eta' \rightarrow \pi^+ \pi^- \gamma) = 29.5 \pm 1.0\%$ and, $B(\eta \rightarrow 2\gamma) = 39.43 \pm 0.26\%$.

STABLE HADRONS

 $\Gamma(2(\pi^+ \pi^-) \pi^0)/\Gamma_{\text{total}}$ Γ_{69}/Γ

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
0.0337 ± 0.0026 OUR AVERAGE				
0.0325 ± 0.0049	46055	AUGUSTIN	89 DM2	$J/\psi \rightarrow 2(\pi^+ \pi^-) \pi^0$
0.0317 ± 0.0042	147	FRANKLIN	83 MRK2	$e^+ e^- \rightarrow \text{hadrons}$
0.0364 ± 0.0052	1500	BURMESTER	77D PLUT	$e^+ e^-$
0.04 ± 0.01	675	JEAN-MARIE	76 MRK1	$e^+ e^-$

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

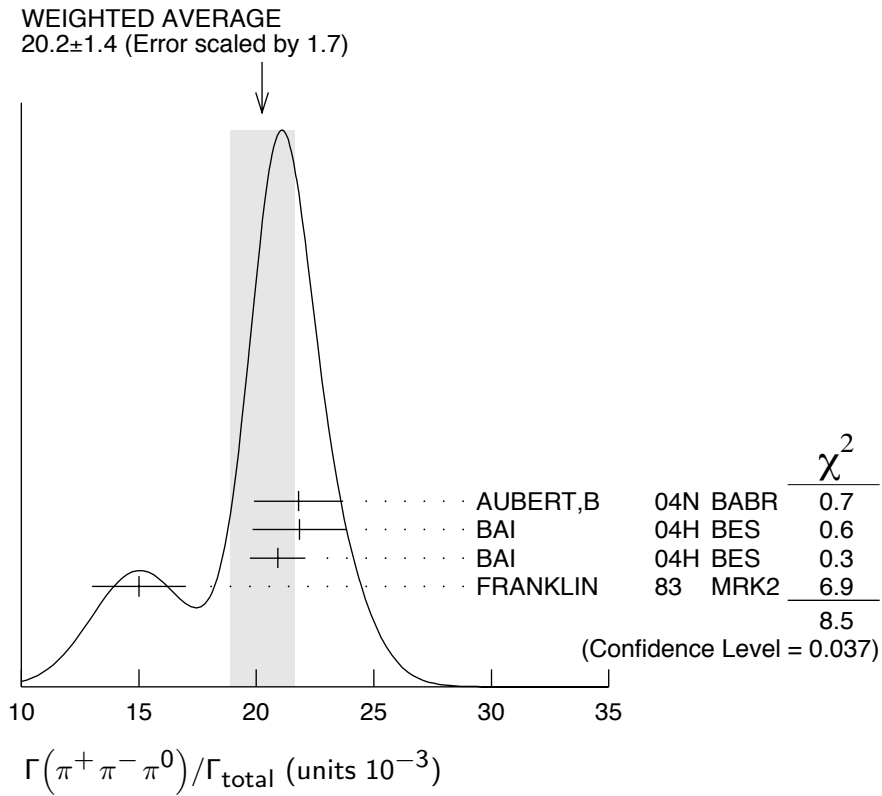
Γ_{70}/Γ

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_{71}/Γ

VALUE (units 10^{-3})	EVTs	DOCUMENT ID	TECN	COMMENT
20.2 ±1.4 OUR AVERAGE				Error includes scale factor of 1.7. See the ideogram below.
21.8 ±1.9	47,48	AUBERT,B	04N BABR	10.6 $e^+e^- \rightarrow \pi^+\pi^-\pi^0\gamma$
21.84±0.05±2.01	220k	48,49 BAI	04H BES	e^+e^-
20.91±0.21±1.16		48,50 BAI	04H BES	e^+e^-
15 ±2	168	FRANKLIN	83	MRK2 e^+e^-



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

Γ_{72}/Γ

VALUE	EVTs	DOCUMENT ID	TECN	COMMENT
0.012±0.003	309	VANNUCCI	77	MRK1 e^+e^-

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

Γ_{73}/Γ

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

$\Gamma(\pi^+\pi^-K^+K^-)/\Gamma_{\text{total}}$ Γ_{74}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
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6.2±0.7 OUR AVERAGE

6.1±0.7±0.2	233	⁴¹ AUBERT	05D BABR	10.6 $e^+e^- \rightarrow K^+K^-\pi^+\pi^-\gamma$
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7.2±2.3	205	VANNUCCI	77 MRK1	e^+e^-
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⁴¹ AUBERT 05D reports $[B(J/\psi \rightarrow \pi^+\pi^-K^+K^-) \times \Gamma(J/\psi \rightarrow e^+e^-)] = (33.6 \pm 2.7 \pm 2.7) \times 10^{-3}$ keV. We divide by our best value $\Gamma(J/\psi \rightarrow e^+e^-) = (5.55 \pm 0.14 \pm 0.02)$ keV. Our first error is the total experiment's error and our second error is the systematic error from using our best value.

 $\Gamma(K\bar{K}\pi)/\Gamma_{\text{total}}$ Γ_{75}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
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61 ±10 OUR AVERAGE

55.2±12.0	25	FRANKLIN	83 MRK2	$e^+e^- \rightarrow K^+K^-\pi^0$
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78.0±21.0	126	VANNUCCI	77 MRK1	$e^+e^- \rightarrow K_S^0 K^\pm \pi^\mp$
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 $\Gamma(p\bar{p}\pi^+\pi^-)/\Gamma_{\text{total}}$ Γ_{76}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
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6.0 ±0.5 OUR AVERAGE Error includes scale factor of 1.3. See the ideogram below.

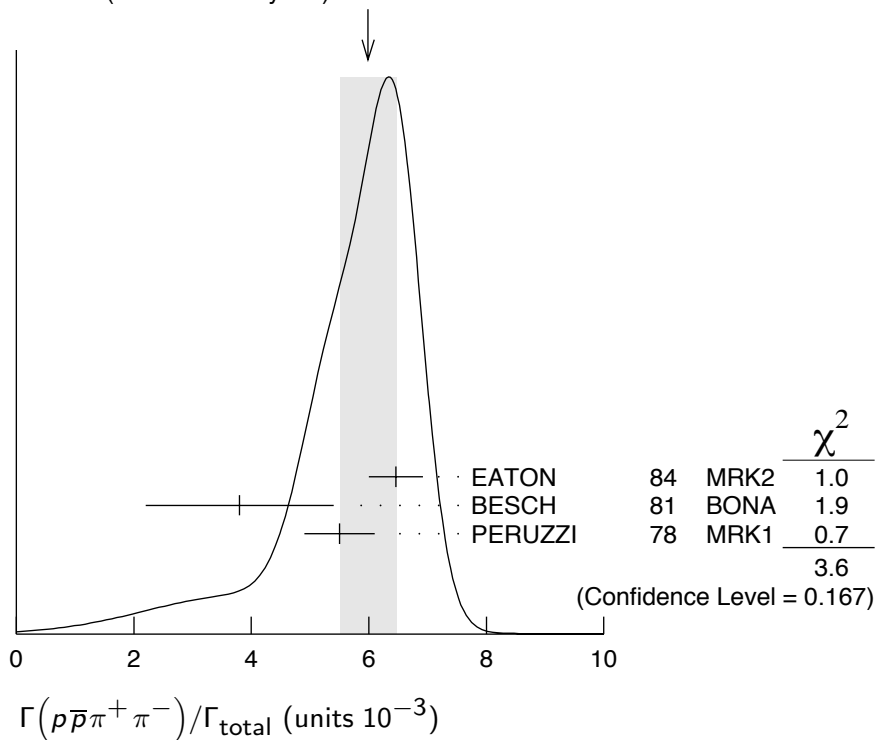
6.46±0.17±0.43	1435	EATON	84 MRK2	e^+e^-
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3.8 ±1.6	48	BESCH	81 BONA	e^+e^-
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5.5 ±0.6	533	PERUZZI	78 MRK1	e^+e^-
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WEIGHTED AVERAGE

6.0±0.5 (Error scaled by 1.3)



$\Gamma(2(\pi^+\pi^-))/\Gamma_{\text{total}}$ Γ_{77}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
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3.55 \pm 0.23 OUR AVERAGE

3.53 \pm 0.12 \pm 0.29	1107	42 ABLIKIM	05H BES2	$e^+e^- \rightarrow \psi(2S) \rightarrow J/\psi \pi^+\pi^-, J/\psi \rightarrow 2\pi^+2\pi^-$
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3.51 \pm 0.34 \pm 0.09	270	43 AUBERT	05D BABR	10.6 $e^+e^- \rightarrow 2(\pi^+\pi^-)\gamma$
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4.0 \pm 1.0	76	JEAN-MARIE	76 MRK1	e^+e^-
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⁴² Computed using $B(J/\psi \rightarrow \mu^+\mu^-) = 0.0588 \pm 0.0010$.⁴³ AUBERT 05D reports $[B(J/\psi \rightarrow 2(\pi^+\pi^-)) \times \Gamma(J/\psi \rightarrow e^+e^-)] = (19.5 \pm 1.4 \pm 1.3) \times 10^{-3}$ keV. We divide by our best value $\Gamma(J/\psi \rightarrow e^+e^-) = (5.55 \pm 0.14 \pm 0.02)$ keV. Our first error is the total experiment's error and our second error is the systematic error from using our best value.

$\Gamma(3(\pi^+\pi^-))/\Gamma_{\text{total}}$ Γ_{78}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
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43 \pm 4 OUR AVERAGE

43.0 \pm 2.9 \pm 2.8	496	35 AUBERT	06D BABR	10.6 $e^+e^- \rightarrow 3(\pi^+\pi^-)\gamma$
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40 \pm 20	32	JEAN-MARIE	76 MRK1	e^+e^-
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$\Gamma(2(\pi^+\pi^-\pi^0))/\Gamma_{\text{total}}$ Γ_{79}/Γ

VALUE (units 10^{-2})	EVTS	DOCUMENT ID	TECN	COMMENT
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1.62 \pm 0.09 \pm 0.19	761	35 AUBERT	06D BABR	10.6 $e^+e^- \rightarrow 2(\pi^+\pi^-\pi^0)\gamma$
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$\Gamma(2(\pi^+\pi^-\eta))/\Gamma_{\text{total}}$ Γ_{80}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
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2.26 \pm 0.08 \pm 0.27	4839	ABLIKIM	05C BES2	$e^+e^- \rightarrow 2(\pi^+\pi^-\eta)$
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$\Gamma(3(\pi^+\pi^-\eta))/\Gamma_{\text{total}}$ Γ_{81}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
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7.24 \pm 0.96 \pm 1.11	616	ABLIKIM	05C BES2	$e^+e^- \rightarrow 3(\pi^+\pi^-\eta)$
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$\Gamma(n\bar{n}\pi^+\pi^-)/\Gamma_{\text{total}}$ Γ_{82}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
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3.8 \pm 3.6	5	BESCH	81 BONA	e^+e^-
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$\Gamma(\Sigma^0\bar{\Sigma}^0)/\Gamma_{\text{total}}$ Γ_{83}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
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1.31 \pm 0.10 OUR AVERAGE

1.33 \pm 0.04 \pm 0.11	1779	ABLIKIM	06 BES2	$J/\psi \rightarrow \Sigma^0\bar{\Sigma}^0$
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1.06 \pm 0.04 \pm 0.23	884 \pm 30	PALLIN	87 DM2	$e^+e^- \rightarrow \Sigma^0\bar{\Sigma}^0$
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1.58 \pm 0.16 \pm 0.25	90	EATON	84 MRK2	$e^+e^- \rightarrow \Sigma^0\bar{\Sigma}^0$
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1.3 \pm 0.4	52	PERUZZI	78 MRK1	$e^+e^- \rightarrow \Sigma^0\bar{\Sigma}^0$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

2.4 \pm 2.6	3	BESCH	81 BONA	$e^+e^- \rightarrow \Sigma^+\bar{\Sigma}^-$
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$\Gamma(2(\pi^+\pi^-)K^+K^-)/\Gamma_{\text{total}}$ Γ_{84}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
47 \pm 7 OUR AVERAGE	Error includes scale factor of 1.3.			
49.8 \pm 4.2 \pm 3.4	205	³⁵ AUBERT	06D BABR	10.6 $e^+e^- \rightarrow \omega K^+K^- 2(\pi^+\pi^-)\gamma$
31 \pm 13	30	VANNUCCI	77 MRK1	e^+e^-

 $\Gamma(p\bar{p}\pi^+\pi^-\pi^0)/\Gamma_{\text{total}}$ Γ_{85}/Γ Including $p\bar{p}\pi^+\pi^-\gamma$ and excluding ω, η, η'

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
2.3 \pm 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 \pm 0.6	39	PERUZZI	78 MRK1	e^+e^-

 $\Gamma(p\bar{p})/\Gamma_{\text{total}}$ Γ_{86}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
2.17 \pm 0.08 OUR AVERAGE				
2.26 \pm 0.01 \pm 0.14	63316	BAI	04E BES2	$e^+e^- \rightarrow J/\psi$
1.97 \pm 0.22	99	BALDINI	98 FENI	e^+e^-
1.91 \pm 0.04 \pm 0.30		PALLIN	87 DM2	e^+e^-
2.16 \pm 0.07 \pm 0.15	1420	EATON	84 MRK2	e^+e^-
2.5 \pm 0.4	133	BRANDELIK	79C DASP	e^+e^-
2.0 \pm 0.5		BESCH	78 BONA	e^+e^-
2.2 \pm 0.2	331	⁴⁴ PERUZZI	78 MRK1	e^+e^-

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

2.0 \pm 0.3	48	ANTONELLI	93 SPEC	e^+e^-
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⁴⁴ Assuming angular distribution $(1+\cos^2\theta)$. $\Gamma(p\bar{p}\eta)/\Gamma_{\text{total}}$ Γ_{87}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
2.09 \pm 0.18 OUR AVERAGE				
2.03 \pm 0.13 \pm 0.15	826	EATON	84 MRK2	e^+e^-
2.5 \pm 1.2		BRANDELIK	79C DASP	e^+e^-
2.3 \pm 0.4	197	PERUZZI	78 MRK1	e^+e^-

 $\Gamma(p\bar{n}\pi^-)/\Gamma_{\text{total}}$ Γ_{88}/Γ

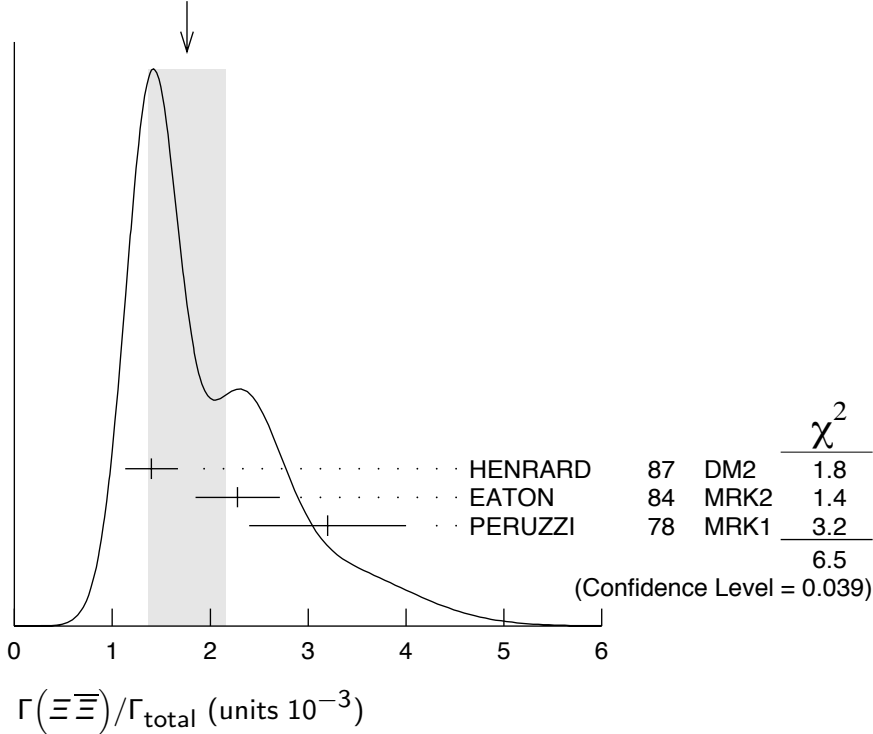
VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
2.00 \pm 0.10 OUR AVERAGE				
2.02 \pm 0.07 \pm 0.16	1288	EATON	84 MRK2	$e^+e^- \rightarrow p\pi^-$
1.93 \pm 0.07 \pm 0.16	1191	EATON	84 MRK2	$e^+e^- \rightarrow \bar{p}\pi^+$
1.7 \pm 0.7	32	BESCH	81 BONA	$e^+e^- \rightarrow p\pi^-$
1.6 \pm 1.2	5	BESCH	81 BONA	$e^+e^- \rightarrow \bar{p}\pi^+$
2.16 \pm 0.29	194	PERUZZI	78 MRK1	$e^+e^- \rightarrow p\pi^-$
2.04 \pm 0.27	204	PERUZZI	78 MRK1	$e^+e^- \rightarrow \bar{p}\pi^+$

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

Γ_{90}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
1.8 ± 0.4 OUR AVERAGE		Error includes scale factor of 1.8. See the ideogram below.		
$1.40 \pm 0.12 \pm 0.24$	132 ± 11	HENRARD	87	DM2 $e^+e^- \rightarrow \Xi^- \Xi^+$
$2.28 \pm 0.16 \pm 0.40$	194	EATON	84	MRK2 $e^+e^- \rightarrow \Xi^- \Xi^+$
3.2 ± 0.8	71	PERUZZI	78	MRK1 e^+e^-

WEIGHTED AVERAGE
 1.8 ± 0.4 (Error scaled by 1.8)



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

Γ_{89}/Γ

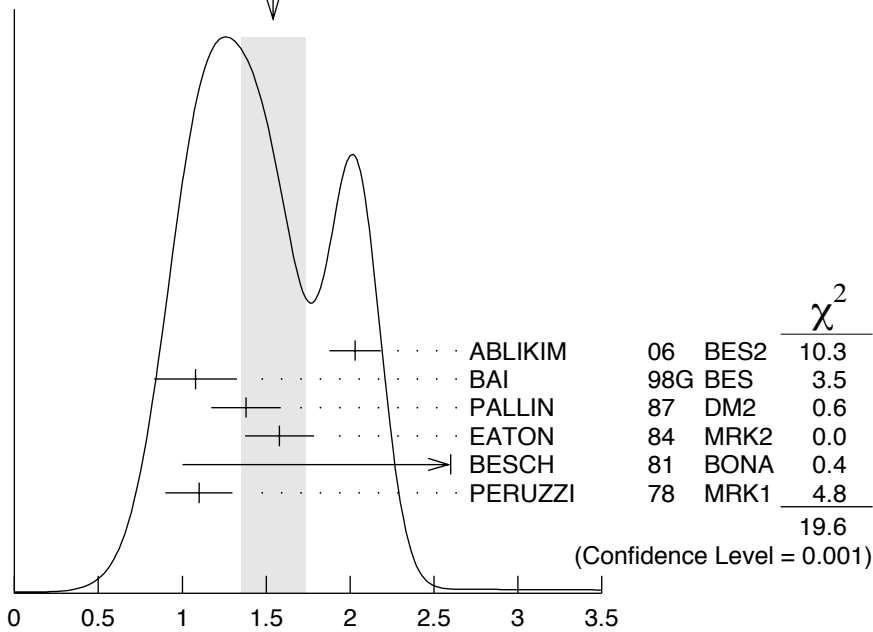
VALUE (units 10^{-2})	EVTS	DOCUMENT ID	TECN	COMMENT
0.22 ± 0.04 OUR AVERAGE				
0.231 ± 0.049	79	BALDINI	98	FENI e^+e^-
0.18 ± 0.09		BESCH	78	BONA e^+e^-
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.190 ± 0.055	40	ANTONELLI	93	SPEC e^+e^-

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

Γ_{91}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
1.54 ± 0.19 OUR AVERAGE		Error includes scale factor of 2.2. See the ideogram below.		
$2.03 \pm 0.03 \pm 0.15$	8887	ABLIKIM	06	BES2 $J/\psi \rightarrow \Lambda \bar{\Lambda}$
$1.08 \pm 0.06 \pm 0.24$	631	BAI	98G	BES e^+e^-
$1.38 \pm 0.05 \pm 0.20$	1847	PALLIN	87	DM2 e^+e^-
$1.58 \pm 0.08 \pm 0.19$	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
 1.54 ± 0.19 (Error scaled by 2.2)



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

Γ_{91}/Γ

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

Γ_{92}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
1.09 ± 0.09 OUR AVERAGE				
$1.13 \pm 0.09 \pm 0.09$	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^-

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

Γ_{93}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
1.06 ± 0.12 OUR AVERAGE				
$0.90 \pm 0.06 \pm 0.16$	225 ± 15	HENRARD	87 DM2	$e^+e^- \rightarrow \Lambda\bar{\Sigma}^+ \pi^-$
$1.11 \pm 0.06 \pm 0.20$	342 ± 18	HENRARD	87 DM2	$e^+e^- \rightarrow \Lambda\bar{\Sigma}^- \pi^+$
$1.53 \pm 0.17 \pm 0.38$	135	EATON	84 MRK2	$e^+e^- \rightarrow \Lambda\bar{\Sigma}^+ \pi^-$
$1.38 \pm 0.21 \pm 0.35$	118	EATON	84 MRK2	$e^+e^- \rightarrow \Lambda\bar{\Sigma}^- \pi^+$

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

Γ_{94}/Γ

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

$\Gamma(2(K^+ K^-))/\Gamma_{\text{total}}$ Γ_{95}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
0.78 ± 0.14 OUR AVERAGE				
$0.72 \pm 0.17 \pm 0.02$	38	45 AUBERT	05D BABR	$10.6 e^+ e^- \rightarrow 2(K^+ K^-) \gamma$
$1.4^{+0.5}_{-0.4} \pm 0.2$	$11.0^{+4.3}_{-3.5}$	39 HUANG	03 BELL	$B^+ \rightarrow 2(K^+ K^-) K^+$
0.7 ± 0.3		VANNUCCI	77 MRK1	$e^+ e^-$
45 AUBERT 05D reports $[B(J/\psi \rightarrow 2(K^+ K^-)) \times \Gamma(J/\psi \rightarrow e^+ e^-)] = (4.0 \pm 0.7 \pm 0.6) \times 10^{-3}$ keV. We divide by our best value $\Gamma(J/\psi \rightarrow e^+ e^-) = (5.55 \pm 0.14 \pm 0.02)$ keV. Our first error is the total experiment's error and our second error is the systematic error from using our best value.				

 $\Gamma(p K^- \bar{\Sigma}^0)/\Gamma_{\text{total}}$ Γ_{96}/Γ

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

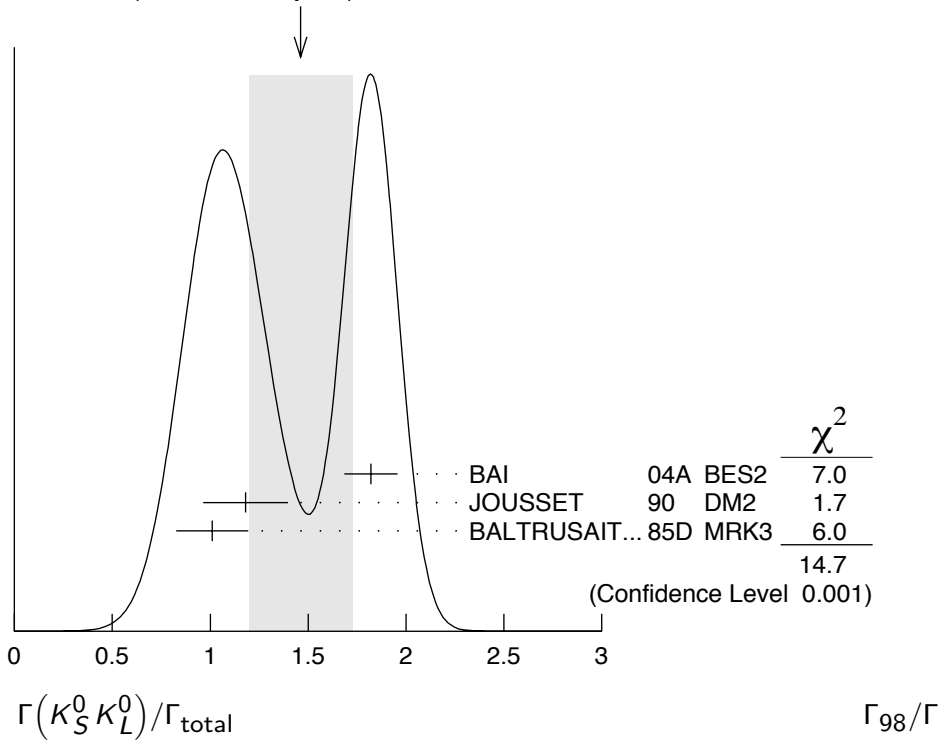
 $\Gamma(K^+ K^-)/\Gamma_{\text{total}}$ Γ_{97}/Γ

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

 $\Gamma(K_S^0 K_L^0)/\Gamma_{\text{total}}$ Γ_{98}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
1.46 ± 0.26 OUR AVERAGE				Error includes scale factor of 2.7. See the ideogram below.
$1.82 \pm 0.04 \pm 0.13$	2155 ± 45	51 BAI	04A BES2	$J/\psi \rightarrow K_S^0 K_L^0 \rightarrow \pi^+ \pi^- X$
$1.18 \pm 0.12 \pm 0.18$		JOUSSET	90 DM2	$J/\psi \rightarrow \text{hadrons}$
$1.01 \pm 0.16 \pm 0.09$	74	BALTRUSAIT..85D	MRK3	$e^+ e^-$

WEIGHTED AVERAGE
1.46±0.26 (Error scaled by 2.7)



Γ(ΛΛ̄π⁰)/Γ_{total} Γ₉₉/Γ

VALUE (units 10 ⁻³)	EVTS	DOCUMENT ID	TECN	COMMENT
0.22±0.06 OUR AVERAGE				
0.23±0.07±0.08	11	BAI	98G BES	e ⁺ e ⁻
0.22±0.05±0.05	19 ± 4	HENRARD	87 DM2	e ⁺ e ⁻

Γ(π⁺π⁻)/Γ_{total} Γ₁₀₀/Γ

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

Γ(ΛΣ̄ + c.c.)/Γ_{total} Γ₁₀₁/Γ

VALUE (units 10 ⁻³)	CL%	DOCUMENT ID	TECN	COMMENT
<0.15	90	PERUZZI	78 MRK1	e ⁺ e ⁻ → ΛX

Γ(K_S⁰K_S⁰)/Γ_{total} Γ₁₀₂/Γ

VALUE (units 10 ⁻⁴)	CL%	DOCUMENT ID	TECN	COMMENT
<0.01	95	⁴⁶ BAI	04D BES	e ⁺ e ⁻
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
<0.052	90	⁴⁶ BALTRUSAIT...85C	MRK3	e ⁺ e ⁻
⁴⁶ Forbidden by CP.				

⁴⁷ From the ratio of $\Gamma(e^+e^-)B(\pi^+\pi^-\pi^0)$ and $\Gamma(e^+e^-)B(\mu^+\mu^-)$ (AUBERT 04).

⁴⁸ Mostly $\rho\pi$, see also $\rho\pi$ subsection.

⁴⁹ From $J/\psi \rightarrow \pi^+\pi^-\pi^0$ events directly.

⁵⁰ 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 $B(J/\psi \rightarrow \mu^+\mu^-) = 5.88 \pm 0.10\%$.

⁵¹ Using $B(K_S^0 \rightarrow \pi^+\pi^-) = 0.6868 \pm 0.0027$.

RADIATIVE DECAYS

$\Gamma(\gamma\eta_c(1S))/\Gamma_{\text{total}}$ Γ_{103}/Γ

VALUE	EVTs	DOCUMENT ID	TECN	COMMENT
0.0127 ± 0.0036		GAISER	86	CBAL $J/\psi \rightarrow \gamma X$

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

0.0079 ± 0.0020	273 ± 43	⁵² AUBERT	06E	BABR $B^\pm \rightarrow K^\pm X_{c\bar{c}}$
seen	16	BALTRUSAIT..84	MRK3	$J/\psi \rightarrow 2\phi\gamma$

⁵² 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.

$\Gamma(\gamma\pi^+\pi^-2\pi^0)/\Gamma_{\text{total}}$ Γ_{104}/Γ

VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
8.3 ± 0.2 ± 3.1	⁵³ BALTRUSAIT..86B	MRK3	$J/\psi \rightarrow 4\pi\gamma$

⁵³ 4π mass less than 2.0 GeV.

$\Gamma(\gamma\eta\pi\pi)/\Gamma_{\text{total}}$ Γ_{105}/Γ

VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
6.1 ± 1.0 OUR AVERAGE			
5.85 ± 0.3 ± 1.05	⁵⁴ EDWARDS	83B	CBAL $J/\psi \rightarrow \eta\pi^+\pi^-$
7.8 ± 1.2 ± 2.4	⁵⁴ EDWARDS	83B	CBAL $J/\psi \rightarrow \eta 2\pi^0$

⁵⁴ Broad enhancement at 1700 MeV.

$\Gamma(\gamma\eta(1405/1475) \rightarrow \gamma K\bar{K}\pi)/\Gamma_{\text{total}}$ Γ_{106}/Γ

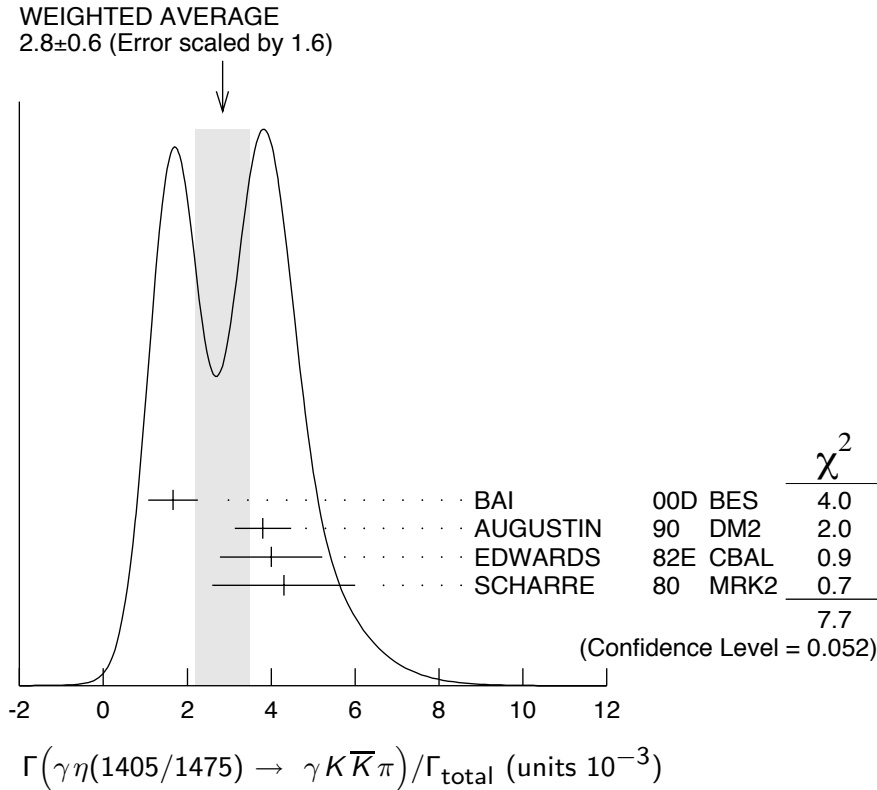
VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
2.8 ± 0.6 OUR AVERAGE	Error includes scale factor of 1.6. See the ideogram below.		

1.66 ± 0.1 ± 0.58	^{55,56} BAI	00D	BES $J/\psi \rightarrow \gamma K^\pm K_S^0 \pi^\mp$
3.8 ± 0.3 ± 0.6	⁵⁷ AUGUSTIN	90	DM2 $J/\psi \rightarrow \gamma K\bar{K}\pi$
4.0 ± 0.7 ± 1.0	⁵⁷ EDWARDS	82E	CBAL $J/\psi \rightarrow K^+ K^- \pi^0 \gamma$
4.3 ± 1.7	^{57,58} SCHARRE	80	MRK2 e^+e^-

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

1.78 ± 0.21 ± 0.33	^{57,59,60} AUGUSTIN	92	DM2 $J/\psi \rightarrow \gamma K\bar{K}\pi$
0.83 ± 0.13 ± 0.18	^{57,61,62} AUGUSTIN	92	DM2 $J/\psi \rightarrow \gamma K\bar{K}\pi$
0.66 $^{+0.17}_{-0.16} \pm 0.24_{-0.15}$	^{57,60,63} BAI	90C	MRK3 $J/\psi \rightarrow \gamma K_S^0 K^\pm \pi^\mp$
1.03 $^{+0.21}_{-0.18} \pm 0.26_{-0.19}$	^{57,62,64} BAI	90C	MRK3 $J/\psi \rightarrow \gamma K_S^0 K^\pm \pi^\mp$

- 55 Interference with the $J/\psi(1S)$ radiative transition to the broad $K\bar{K}\pi$ pseudoscalar state around 1800 is $(0.15 \pm 0.01 \pm 0.05) \times 10^{-3}$.
 56 Interference with $J/\psi \rightarrow \gamma f_1(1420)$ is $(-0.03 \pm 0.01 \pm 0.01) \times 10^{-3}$.
 57 Includes unknown branching fraction $\eta(1405) \rightarrow K\bar{K}\pi$.
 58 Corrected for spin-zero hypothesis for $\eta(1405)$.
 59 From fit to the $a_0(980)\pi$ 0^-+ partial wave.
 60 $a_0(980)\pi$ mode.
 61 From fit to the $K^*(892)K$ 0^-+ partial wave.
 62 K^*K mode.
 63 From $a_0(980)\pi$ final state.
 64 From $K^*(890)K$ final state.



$\Gamma(\gamma\eta(1405/1475) \rightarrow \gamma\gamma\rho^0) / \Gamma_{\text{total}}$ Γ_{107}/Γ

VALUE (units 10^{-5})	DOCUMENT ID	TECN	COMMENT
0.78 ± 0.20 OUR AVERAGE	Error includes scale factor of 1.8.		
$1.07 \pm 0.17 \pm 0.11$	65 BAI	04J BES2	$J/\psi \rightarrow \gamma\gamma\pi^+\pi^-$
$0.64 \pm 0.12 \pm 0.07$	65 COFFMAN	90 MRK3	$J/\psi \rightarrow \gamma\gamma\pi^+\pi^-$

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

$\Gamma(\gamma\eta(1405/1475) \rightarrow \gamma\eta\pi^+\pi^-) / \Gamma_{\text{total}}$ Γ_{108}/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	$J/\psi \rightarrow \gamma\eta\pi^+\pi^-$
$3.38 \pm 0.33 \pm 0.64$		66 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	67 AUGUSTIN	90 DM2	$J/\psi \rightarrow \gamma\eta\pi^+\pi^-$

⁶⁶ Via $a_0(980)\pi$.⁶⁷ Includes unknown branching fraction to $\eta\pi^+\pi^-$. $\Gamma(\gamma\rho\rho)/\Gamma_{\text{total}}$ Γ_{110}/Γ

VALUE (units 10^{-3})	CL%	DOCUMENT ID	TECN	COMMENT
4.5 ± 0.8 OUR AVERAGE				
4.7 ± 0.3 ± 0.9		⁶⁸ BALTRUSAIT..86B	MRK3	$J/\psi \rightarrow 4\pi\gamma$
3.75 ± 1.05 ± 1.20		⁶⁹ BURKE	82 MRK2	$J/\psi \rightarrow 4\pi\gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<0.09	90	⁷⁰ BISELLO	89B	$J/\psi \rightarrow 4\pi\gamma$
⁶⁸ 4π mass less than 2.0 GeV.				
⁶⁹ 4π mass less than 2.0 GeV. We have multiplied $2\rho^0$ measurement by 3 to obtain 2ρ .				
⁷⁰ 4π mass in the range 2.0–25 GeV.				

 $\Gamma(\gamma\eta(1405/1475) \rightarrow \gamma\gamma\phi)/\Gamma_{\text{total}}$ Γ_{109}/Γ

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

 $\Gamma(\gamma\eta_2(1870) \rightarrow \gamma\pi^+\pi^-)/\Gamma_{\text{total}}$ Γ_{111}/Γ

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

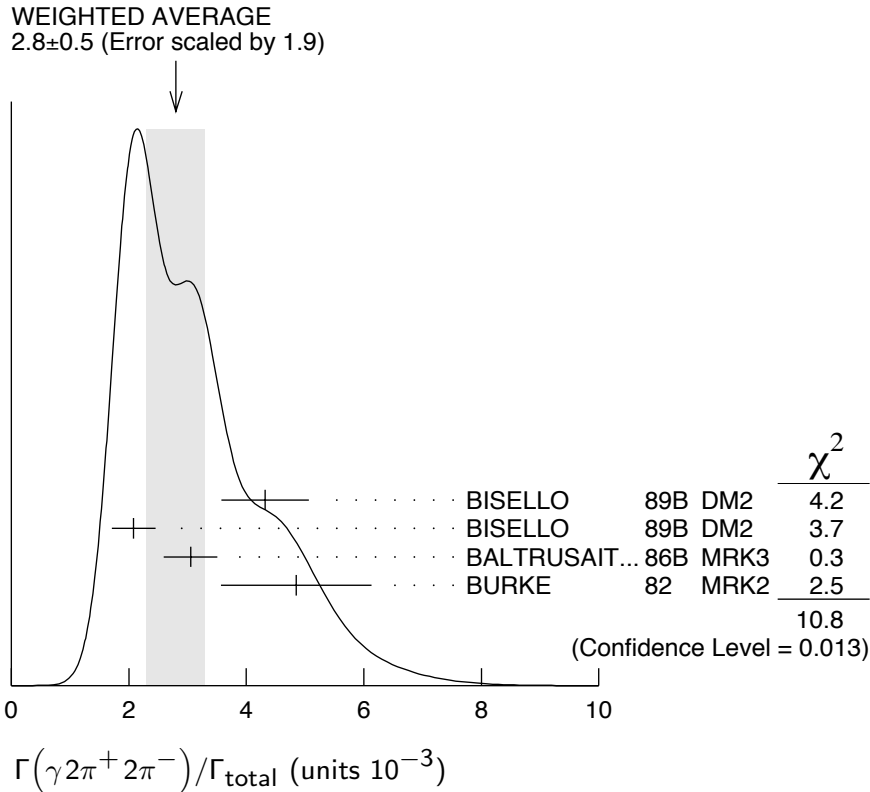
 $\Gamma(\gamma\eta'(958))/\Gamma_{\text{total}}$ Γ_{112}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
4.71 ± 0.27 OUR AVERAGE				Error includes scale factor of 1.1.
5.55 ± 0.44	35k	ABLIKIM	06E BES2	$J/\psi \rightarrow \eta'\gamma$
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	$e^+e^- \rightarrow 3\gamma + \text{hadrons}$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
2.9 ± 1.1	6	BRANDELIK	79C DASP	$e^+e^- \rightarrow 3\gamma$
2.4 ± 0.7	57	BARTEL	76 CNTR	$e^+e^- \rightarrow 2\gamma\rho$

 $\Gamma(\gamma 2\pi^+ 2\pi^-)/\Gamma_{\text{total}}$ Γ_{113}/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	⁷¹ BISELLO	89B DM2	$J/\psi \rightarrow 4\pi\gamma$
2.08 ± 0.13 ± 0.35	⁷² BISELLO	89B DM2	$J/\psi \rightarrow 4\pi\gamma$
3.05 ± 0.08 ± 0.45	⁷² BALTRUSAIT..86B	MRK3	$J/\psi \rightarrow 4\pi\gamma$
4.85 ± 0.45 ± 1.20	⁷³ BURKE	82 MRK2	e^+e^-

⁷¹ 4π mass less than 3.0 GeV.
⁷² 4π mass less than 2.0 GeV.
⁷³ 4π mass less than 2.5 GeV.



$\Gamma(\gamma f_2(1270) f_2(1270)) / \Gamma_{\text{total}}$				Γ_{114} / Γ
VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
$9.5 \pm 0.7 \pm 1.6$	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_{115} / Γ
VALUE (units 10^{-4})		DOCUMENT ID	TECN	COMMENT
$8.2 \pm 0.8 \pm 1.7$	⁷⁴	ABLIKIM	04M BES	$J/\psi \rightarrow \gamma 2\pi^+ 2\pi^-$
⁷⁴ Subtracting contribution from intermediate $\eta_c(1S)$ decays.				

$\Gamma(\gamma K^+ K^- \pi^+ \pi^-) / \Gamma_{\text{total}}$				Γ_{116} / Γ
VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
$2.1 \pm 0.1 \pm 0.6$	1516	BAI	00B BES	$J/\psi \rightarrow \gamma K^+ K^0 \pi^+ \pi^-$

$\Gamma(\gamma f_4(2050)) / \Gamma_{\text{total}}$				Γ_{117} / Γ
VALUE (units 10^{-3})		DOCUMENT ID	TECN	COMMENT
$2.7 \pm 0.5 \pm 0.5$	⁷⁵	BALTRUSAIT..87	MRK3	$J/\psi \rightarrow \gamma \pi^+ \pi^-$
⁷⁵ Assuming branching fraction $f_4(2050) \rightarrow \pi \pi / \text{total} = 0.167$.				

$\Gamma(\gamma\omega\omega)/\Gamma_{\text{total}}$ Γ_{118}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
1.59 ± 0.33 OUR AVERAGE				
$1.41 \pm 0.2 \pm 0.42$	120 ± 17	BISELLO	87 SPEC	e^+e^- , hadrons γ
$1.76 \pm 0.09 \pm 0.45$		BALTRUSAIT..85C	MRK3	$e^+e^- \rightarrow$ hadrons γ

 $\Gamma(\gamma\eta(1405/1475) \rightarrow \gamma\rho^0\rho^0)/\Gamma_{\text{total}}$ Γ_{119}/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	^{76,77} BISELLO	89B DM2	$J/\psi \rightarrow 4\pi\gamma$

⁷⁶ Estimated by us from various fits.⁷⁷ Includes unknown branching fraction to $\rho^0\rho^0$.
 $\Gamma(\gamma f_2(1270))/\Gamma_{\text{total}}$ Γ_{120}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	CHG	COMMENT
1.38 ± 0.14 OUR AVERAGE					
$1.33 \pm 0.05 \pm 0.20$		⁷⁸ AUGUSTIN	87 DM2		$J/\psi \rightarrow \gamma\pi^+\pi^-$
$1.36 \pm 0.09 \pm 0.23$		⁷⁸ BALTRUSAIT..87	MRK3		$J/\psi \rightarrow \gamma\pi^+\pi^-$
$1.48 \pm 0.25 \pm 0.30$	178	EDWARDS	82B CBAL		$e^+e^- \rightarrow 2\pi^0\gamma$
2.0 ± 0.7	35	ALEXANDER	78 PLUT 0		e^+e^-
1.2 ± 0.6	30	⁷⁹ BRANDELIK	78B DASP		$e^+e^- \rightarrow \pi^+\pi^-\gamma$

⁷⁸ 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.⁷⁹ Restated by us to take account of spread of E1, M2, E3 transitions.
 $\Gamma(\gamma f_0(1710) \rightarrow \gamma K\bar{K})/\Gamma_{\text{total}}$ Γ_{121}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID	TECN	COMMENT
8.5 ± 1.2 OUR AVERAGE		Error includes scale factor of 1.2.		
$9.62 \pm 0.29 \pm 3.51$	-1.86	⁸⁰ BAI	03G BES	$J/\psi \rightarrow \gamma K\bar{K}$
$5.0 \pm 0.8 \pm 1.8$	-0.4	^{81,82} BAI	96C BES	$J/\psi \rightarrow \gamma K^+ K^-$
$9.2 \pm 1.4 \pm 1.4$		⁸² AUGUSTIN	88 DM2	$J/\psi \rightarrow \gamma K^+ K^-$
$10.4 \pm 1.2 \pm 1.6$		⁸² AUGUSTIN	88 DM2	$J/\psi \rightarrow \gamma K_S^0 K_S^0$
$9.6 \pm 1.2 \pm 1.8$		⁸² BALTRUSAIT..87	MRK3	$J/\psi \rightarrow \gamma K^+ K^-$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
$1.6 \pm 0.2 \pm 0.6$	-0.2	^{82,83} BAI	96C BES	$J/\psi \rightarrow \gamma K^+ K^-$
< 0.8		⁸⁴ BISELLO	89B	$J/\psi \rightarrow 4\pi\gamma$
$1.6 \pm 0.4 \pm 0.3$		⁸⁵ BALTRUSAIT..87	MRK3	$J/\psi \rightarrow \gamma\pi^+\pi^-$
3.8 ± 1.6		⁸⁶ EDWARDS	82D CBAL	$e^+e^- \rightarrow \eta\eta\gamma$

⁸⁰ Includes unknown branching ratio to K^+K^- or $K_S^0 K_S^0$.⁸¹ Assuming $J^P = 2^+$ for $f_0(1710)$.⁸² 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.⁸³ Assuming $J^P = 0^+$ for $f_0(1710)$.⁸⁴ Includes unknown branching fraction to $\rho^0\rho^0$.⁸⁵ Includes unknown branching fraction to $\pi^+\pi^-$.⁸⁶ Includes unknown branching fraction to $\eta\eta$.

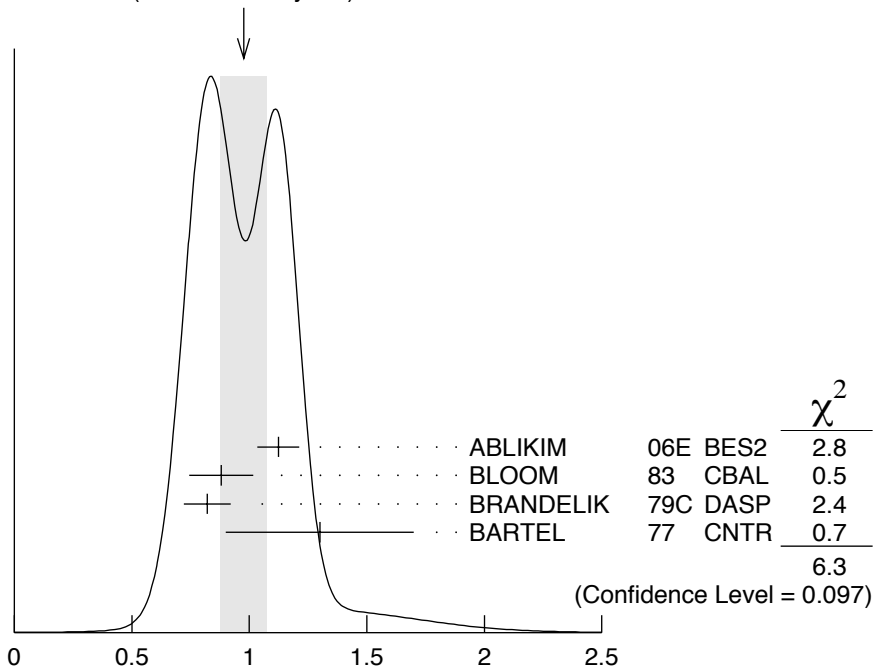
$\Gamma(\gamma f_0(1710) \rightarrow \gamma \pi \pi) / \Gamma_{\text{total}}$ Γ_{122} / Γ

VALUE (units 10^{-4})	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
$2.5 \pm 1.6 \pm 0.8$	BAI	98H BES	$J/\psi \rightarrow \gamma \pi^0 \pi^0$

 $\Gamma(\gamma \eta) / \Gamma_{\text{total}}$ Γ_{123} / Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
0.98 ± 0.10 OUR AVERAGE		Error includes scale factor of 1.7. See the ideogram below.		
1.123 ± 0.089	11k	ABLIKIM	06E BES2	$J/\psi \rightarrow \eta \gamma$
$0.88 \pm 0.08 \pm 0.11$		BLOOM	83 CBAL	$e^+ e^-$
0.82 ± 0.10		BRANDELIK	79C DASP	$e^+ e^-$
1.3 ± 0.4	21	BARTEL	77 CNTR	$e^+ e^-$

WEIGHTED AVERAGE
 0.98 ± 0.10 (Error scaled by 1.7)

 $\Gamma(\gamma \eta) / \Gamma_{\text{total}}$ Γ_{123} / Γ $\Gamma(\gamma f_1(1420) \rightarrow \gamma K \bar{K} \pi) / \Gamma_{\text{total}}$ Γ_{124} / Γ

VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
0.79 ± 0.13 OUR AVERAGE			
$0.68 \pm 0.04 \pm 0.24$	BAI	00D BES	$J/\psi \rightarrow \gamma K^\pm K_S^0 \pi^\mp$
$0.76 \pm 0.15 \pm 0.21$	87,88 AUGUSTIN	92 DM2	$J/\psi \rightarrow \gamma K \bar{K} \pi$
$0.87 \pm 0.14^{+0.14}_{-0.11}$	87 BAI	90C MRK3	$J/\psi \rightarrow \gamma K_S^0 K^\pm \pi^\mp$

⁸⁷ Included unknown branching fraction $f_1(1420) \rightarrow K \bar{K} \pi$.

⁸⁸ From fit to the $K^*(892) K 1^{++}$ partial wave.

$\Gamma(\gamma f_1(1285))/\Gamma_{\text{total}}$ Γ_{125}/Γ

VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
0.61 \pm 0.08 OUR AVERAGE			
0.69 \pm 0.16 \pm 0.20	89 BAI	04J BES2	$J/\psi \rightarrow \gamma \gamma \rho^0$
0.61 \pm 0.04 \pm 0.21	90 BAI	00D BES	$J/\psi \rightarrow \gamma K^\pm K_S^0 \pi^\mp$
0.45 \pm 0.09 \pm 0.17	91 BAI	99 BES	$J/\psi \rightarrow \gamma \eta \pi^+ \pi^-$
0.625 \pm 0.063 \pm 0.103	92 BOLTON	92 MRK3	$J/\psi \rightarrow \gamma f_1(1285)$
0.70 \pm 0.08 \pm 0.16	93 BOLTON	92B MRK3	$J/\psi \rightarrow \gamma \eta \pi^+ \pi^-$
89 Assuming $B(f_1(1285) \rightarrow \rho^0 \gamma) = 0.055 \pm 0.013$.			
90 Assuming $\Gamma(f_1(1285) \rightarrow K \bar{K} \pi)/\Gamma_{\text{total}} = 0.090 \pm 0.004$.			
91 Assuming $\Gamma(f_1(1285) \rightarrow \eta \pi \pi)/\Gamma_{\text{total}} = 0.5 \pm 0.18$.			
92 Obtained summing the sequential decay channels			
$B(J/\psi \rightarrow \gamma f_1(1285), f_1(1285) \rightarrow \pi \pi \pi \pi) = (1.44 \pm 0.39 \pm 0.27) \times 10^{-4}$;			
$B(J/\psi \rightarrow \gamma f_1(1285), f_1(1285) \rightarrow a_0(980) \pi, a_0(980) \rightarrow \eta \pi) = (3.90 \pm 0.42 \pm 0.87) \times 10^{-4}$;			
$B(J/\psi \rightarrow \gamma f_1(1285), f_1(1285) \rightarrow a_0(980) \pi, a_0(980) \rightarrow K \bar{K}) = (0.66 \pm 0.26 \pm 0.29) \times 10^{-4}$;			
$B(J/\psi \rightarrow \gamma f_1(1285), f_1(1285) \rightarrow \gamma \rho^0) = (0.25 \pm 0.07 \pm 0.03) \times 10^{-4}$.			
93 Using $B(f_1(1285) \rightarrow a_0(980) \pi) = 0.37$, and including unknown branching ratio for $a_0(980) \rightarrow \eta \pi$.			

$\Gamma(\gamma f_1(1510) \rightarrow \gamma \eta \pi^+ \pi^-)/\Gamma_{\text{total}}$ Γ_{126}/Γ

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

$\Gamma(\gamma f'_2(1525))/\Gamma_{\text{total}}$ Γ_{127}/Γ

VALUE (units 10^{-4})	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
4.5 $^{+0.7}_{-0.4}$ OUR AVERAGE					
3.85 \pm 0.17 $^{+1.91}_{-0.73}$			94 BAI	03G BES	$J/\psi \rightarrow \gamma K \bar{K}$
3.6 \pm 0.4 $^{+1.4}_{-0.4}$			94 BAI	96C BES	$J/\psi \rightarrow \gamma K^+ K^-$
5.6 \pm 1.4 \pm 0.9			94 AUGUSTIN	88 DM2	$J/\psi \rightarrow \gamma K^+ K^-$
4.5 \pm 0.4 \pm 0.9			94 AUGUSTIN	88 DM2	$J/\psi \rightarrow \gamma K_S^0 K_S^0$
6.8 \pm 1.6 \pm 1.4			94 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	95 BRANDELIK	79C DASP	$e^+ e^- \rightarrow \pi^+ \pi^- \gamma$
<2.3	90	3	ALEXANDER	78 PLUT	$e^+ e^- \rightarrow K^+ K^- \gamma$
94 Using $B(f'_2(1525) \rightarrow K \bar{K}) = 0.888$.					
95 Assuming isotropic production and decay of the $f'_2(1525)$ and isospin.					

$\Gamma(\gamma X(1835))/\Gamma_{\text{total}}$ Γ_{134}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT
22.0 \pm 4.0 \pm 4.0	264	96 ABLIKIM	05R BES2	$J/\psi \rightarrow \gamma \pi^+ \pi^- \eta'$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
7.0 \pm 0.4 $^{+1.9}_{-0.8}$		97 BAI	03F BES2	$J/\psi \rightarrow \gamma p \bar{p}$

⁹⁶ Including the unknown branching fraction to $\pi^+ \pi^- \eta'$.

⁹⁷ Including the unknown branching fraction to $\rho \bar{\rho}$. The fit including final state interaction effects according to SIBIRTSEV 05A gives close results.

$\Gamma(\gamma f_2(1950) \rightarrow \gamma K^*(892) \bar{K}^*(892))/\Gamma_{\text{total}}$ Γ_{128}/Γ

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

$\Gamma(\gamma K^*(892) \bar{K}^*(892))/\Gamma_{\text{total}}$ Γ_{129}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
$4.0 \pm 0.3 \pm 1.3$	320	⁹⁸ BAI	00B BES	$J/\psi \rightarrow \gamma K^+ K^0 \pi^+ \pi^-$

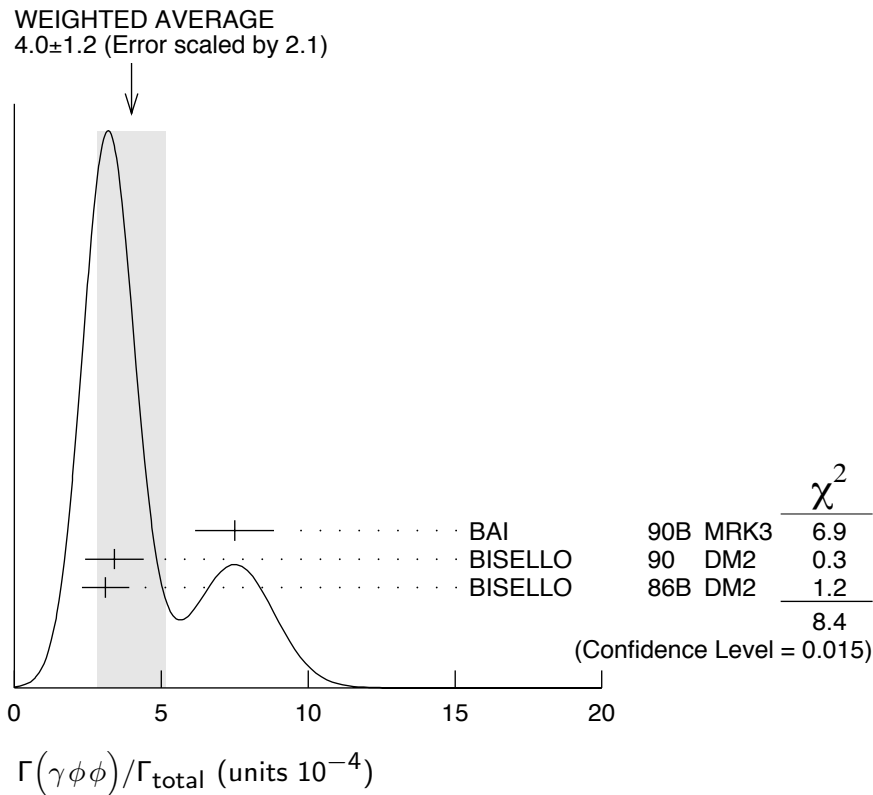
⁹⁸ Summed over all charges.

$\Gamma(\gamma \phi \phi)/\Gamma_{\text{total}}$ Γ_{130}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
4.0 ± 1.2 OUR AVERAGE		Error includes scale factor of 2.1. See the ideogram below.		

$7.5 \pm 0.6 \pm 1.2$	168	BAI	90B MRK3	$J/\psi \rightarrow \gamma 4K$
$3.4 \pm 0.8 \pm 0.6$	33 ± 7	⁹⁹ BISELLO	90 DM2	$J/\psi \rightarrow \gamma K^+ K^- K_S^0 K_L^0$
$3.1 \pm 0.7 \pm 0.4$		⁹⁹ BISELLO	86B DM2	$J/\psi \rightarrow \gamma K^+ K^- K^+ K^-$

⁹⁹ $\phi \phi$ mass less than 2.9 GeV, η_C excluded.



$\Gamma(\gamma\rho\bar{\rho})/\Gamma_{\text{total}}$ Γ_{131}/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^-

 $\Gamma(\gamma\eta(2225))/\Gamma_{\text{total}}$ Γ_{132}/Γ

VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
0.29 ± 0.06 OUR AVERAGE			
$0.33 \pm 0.08 \pm 0.05$	¹⁰⁰ BAI	90B MRK3	$J/\psi \rightarrow \gamma K^+ K^- K^+ K^-$
$0.27 \pm 0.06 \pm 0.06$	¹⁰⁰ BAI	90B MRK3	$J/\psi \rightarrow \gamma K^+ K^- K_S^0 K_L^0$
$0.24^{+0.15}_{-0.10}$	^{101,102} BISELLO	89B DM2	$J/\psi \rightarrow 4\pi\gamma$

¹⁰⁰ Includes unknown branching fraction to $\phi\phi$.¹⁰¹ Estimated by us from various fits.¹⁰² Includes unknown branching fraction to $\rho^0\rho^0$.
 $\Gamma(\gamma\eta(1760) \rightarrow \gamma\rho^0\rho^0)/\Gamma_{\text{total}}$ Γ_{133}/Γ

VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
0.13 ± 0.09	^{103,104} BISELLO	89B DM2	$J/\psi \rightarrow 4\pi\gamma$

¹⁰³ Estimated by us from various fits.¹⁰⁴ Includes unknown branching fraction to $\rho^0\rho^0$.
 $\Gamma(\gamma(K\bar{K}\pi)_{JPC=0-+})/\Gamma_{\text{total}}$ Γ_{135}/Γ

VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
0.7 ± 0.4 OUR AVERAGE	Error includes scale factor of 2.1.		
$0.58 \pm 0.03 \pm 0.20$	¹⁰⁵ BAI	00D BES	$J/\psi \rightarrow \gamma K^\pm K_S^0 \pi^\mp$
$2.1 \pm 0.1 \pm 0.7$	¹⁰⁶ BAI	00D BES	$J/\psi \rightarrow \gamma K^\pm K_S^0 \pi^\mp$

¹⁰⁵ For a broad structure around 1800 MeV.¹⁰⁶ For a broad structure around 2040 MeV.
 $\Gamma(\gamma\pi^0)/\Gamma_{\text{total}}$ Γ_{136}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT
$3.3^{+0.6}_{-0.4}$ OUR AVERAGE				
$3.13^{+0.65}_{-0.47}$	586	ABLIKIM	06E BES2	$J/\psi \rightarrow \pi^0\gamma$
$3.6 \pm 1.1 \pm 0.7$		BLOOM	83 CBAL	e^+e^-
7.3 ± 4.7	10	BRANDELIK	79C DASP	e^+e^-

 $\Gamma(\gamma\rho\bar{\rho}\pi^+\pi^-)/\Gamma_{\text{total}}$ Γ_{137}/Γ

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

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

VALUE (units 10^{-3})	CL%	DOCUMENT ID	TECN	COMMENT
<0.5	90	BARTEL	77	CNTR e^+e^-

$\Gamma(\gamma\Lambda\bar{\Lambda})/\Gamma_{\text{total}}$ Γ_{139}/Γ

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

 $\Gamma(3\gamma)/\Gamma_{\text{total}}$ Γ_{140}/Γ

VALUE (units 10^{-3})	CL%	DOCUMENT ID	TECN	COMMENT
<0.055	90	PARTRIDGE	80 CBAL	e^+e^-

 $\Gamma(\gamma f_0(2200))/\Gamma_{\text{total}}$ Γ_{141}/Γ

VALUE (units 10^{-4})	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
1.5	¹⁰⁷ AUGUSTIN	88 DM2	$J/\psi \rightarrow \gamma K_S^0 K_S^0$
¹⁰⁷ Includes unknown branching fraction to $K_S^0 K_S^0$.			

 $\Gamma(\gamma f_J(2220))/\Gamma_{\text{total}}$ Γ_{142}/Γ

VALUE (units 10^{-5})	CL%	EVTs	DOCUMENT ID	TECN	COMMENT
>250	99.9	108	HASAN	96 SPEC	$\bar{p}p \rightarrow \pi^+\pi^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
>300		109	BAI	96B BES	$e^+e^- \rightarrow \gamma \bar{p}p, K\bar{K}$
< 2.3	95	110	AUGUSTIN	88 DM2	$J/\psi \rightarrow \gamma K^+K^-$
< 1.6	95	110	AUGUSTIN	88 DM2	$J/\psi \rightarrow \gamma K_S^0 K_S^0$
$12.4^{+6.4}_{-5.2} \pm 2.8$		23	¹¹⁰ BALTRUSAIT..86D	MRK3	$J/\psi \rightarrow \gamma K_S^0 K_S^0$
$8.4^{+3.4}_{-2.8} \pm 1.6$		93	¹¹⁰ BALTRUSAIT..86D	MRK3	$J/\psi \rightarrow \gamma K^+K^-$

¹⁰⁸ Using BAI 96B.¹⁰⁹ Using BARNES 93.¹¹⁰ 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_{143}/Γ

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

 $\Gamma(\gamma f_J(2220) \rightarrow \gamma K \bar{K})/\Gamma_{\text{total}}$ Γ_{144}/Γ

VALUE (units 10^{-5})	DOCUMENT ID	TECN	COMMENT
8.1 ± 3.0 OUR AVERAGE			
$6.6 \pm 2.9 \pm 2.4$	BAI	96B BES	$e^+e^- \rightarrow J/\psi \rightarrow \gamma K^+K^-$
$10.8 \pm 4.0 \pm 3.2$	BAI	96B BES	$e^+e^- \rightarrow J/\psi \rightarrow \gamma K_S^0 K_S^0$

 $\Gamma(\gamma f_J(2220) \rightarrow \gamma p \bar{p})/\Gamma_{\text{total}}$ Γ_{145}/Γ

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

$\Gamma(\gamma f_0(1500))/\Gamma_{\text{total}}$ Γ_{146}/Γ

VALUE (units 10^{-4})	DOCUMENT ID	TECN	COMMENT
$>5.7 \pm 0.8$	111,112 BUGG	95 MRK3	$J/\psi \rightarrow \gamma \pi^+ \pi^- \pi^+ \pi^-$

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

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

 $\Gamma(\gamma e^+ e^-)/\Gamma_{\text{total}}$ Γ_{147}/Γ

VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
$8.8 \pm 1.3 \pm 0.4$	113 ARMSTRONG	96 E760	$\bar{p} p \rightarrow e^+ e^- \gamma$

113 For $E_\gamma > 100$ MeV.

LEPTON FAMILY NUMBER (LF) VIOLATING MODES

 $\Gamma(e^\pm \mu^\mp)/\Gamma_{\text{total}}$ Γ_{148}/Γ

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

 $\Gamma(e^\pm \tau^\mp)/\Gamma_{\text{total}}$ Γ_{149}/Γ

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

 $\Gamma(\mu^\pm \tau^\mp)/\Gamma_{\text{total}}$ Γ_{150}/Γ

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

$J/\psi(1S)$ REFERENCES

ABLIKIM	06	PL B632 181	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.)
ADAMS	06A	PR D73 051103R	G.S. Adams <i>et al.</i>	(CLEO Collab.)
AUBERT	06B	PR D73 012005	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	06D	PR D73 052003	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	06E	PRL 96 052002	B. Aubert <i>et al.</i>	(BABAR Collab.)
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>	(BEPC 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 Collab.)
BAI	03G	PR D68 052003	J.Z. Bai <i>et al.</i>	(BES Collab.)
HUANG	03	PRL 91 241802	H.-C. Huang <i>et al.</i>	(BELLE Collab.)
BAI	02C	PRL 88 101802	J.Z. Bai <i>et al.</i>	(BES Collab.)
ARTAMONOV	00	PL B474 427	A.S. Artamonov <i>et al.</i>	
BAI	00	PRL 84 594	J.Z. Bai <i>et al.</i>	(BES Collab.)
BAI	00B	PL B472 200	J.Z. Bai <i>et al.</i>	(BES Collab.)
BAI	00D	PL B476 25	J.Z. Bai <i>et al.</i>	(BES Collab.)
BAI	99	PL B446 356	J.Z. Bai <i>et al.</i>	(BES Collab.)
BAI	99C	PRL 83 1918	J.Z. Bai <i>et al.</i>	(BES Collab.)
BAI	98D	PR D58 092006	J.Z. Bai <i>et al.</i>	(BES Collab.)
BAI	98G	PL B424 213	J.Z. Bai <i>et al.</i>	(BES Collab.)
BAI	98H	PRL 81 1179	J.Z. Bai <i>et al.</i>	(BES Collab.)
BALDINI	98	PL B444 111	R. Baldini <i>et al.</i>	(FENICE Collab.)
ARMSTRONG	96	PR D54 7067	T.A. Armstrong <i>et al.</i>	(E760 Collab.)
BAI	96B	PRL 76 3502	J.Z. Bai <i>et al.</i>	(BES Collab.)
BAI	96C	PRL 77 3959	J.Z. Bai <i>et al.</i>	(BES Collab.)
BAI	96D	PR D54 1221	J.Z. Bai <i>et al.</i>	(BES Collab.)
GRIBUSHIN	96	PR D53 4723	A. Gribushin <i>et al.</i>	(E672 Collab., E706 Collab.)
HASAN	96	PL B388 376	A. Hasan, D.V. Bugg	(BRUN, LOQM)
BAI	95B	PL B355 374	J.Z. Bai <i>et al.</i>	(BES Collab.)
BUGG	95	PL B353 378	D.V. Bugg <i>et al.</i>	(LOQM, PNPI, WASH)
ANTONELLI	93	PL B301 317	A. Antonelli <i>et al.</i>	(FENICE Collab.)
ARMSTRONG	93B	PR D47 772	T.A. Armstrong <i>et al.</i>	(FNAL E760 Collab.)
BARNES	93	PL B309 469	P.D. Barnes, P. Birien, W.H. Breunlich	
AUGUSTIN	92	PR D46 1951	J.E. Augustin, G. Cosme	(DM2 Collab.)
BOLTON	92	PL B278 495	T. Bolton <i>et al.</i>	(Mark III Collab.)
BOLTON	92B	PRL 69 1328	T. Bolton <i>et al.</i>	(Mark III Collab.)
COFFMAN	92	PRL 68 282	D.M. Coffman <i>et al.</i>	(Mark III Collab.)
HSUEH	92	PR D45 R2181	S. Hsueh, S. Palestini	(FNAL, TORI)
BISELLO	91	NP B350 1	D. Bisello <i>et al.</i>	(DM2 Collab.)
AUGUSTIN	90	PR D42 10	J.E. Augustin <i>et al.</i>	(DM2 Collab.)
BAI	90B	PRL 65 1309	Z. Bai <i>et al.</i>	(Mark III Collab.)
BAI	90C	PRL 65 2507	Z. Bai <i>et al.</i>	(Mark III Collab.)
BISELLO	90	PL B241 617	D. Bisello <i>et al.</i>	(DM2 Collab.)
COFFMAN	90	PR D41 1410	D.M. Coffman <i>et al.</i>	(Mark III Collab.)
JOUSSET	90	PR D41 1389	J. Jousset <i>et al.</i>	(DM2 Collab.)
ALEXANDER	89	NP B320 45	J.P. Alexander <i>et al.</i>	(LBL, MICH, SLAC)
AUGUSTIN	89	NP B320 1	J.E. Augustin, G. Cosme	(DM2 Collab.)
BISELLO	89B	PR D39 701	G. Busetto <i>et al.</i>	(DM2 Collab.)
AUGUSTIN	88	PRL 60 2238	J.E. Augustin <i>et al.</i>	(DM2 Collab.)
COFFMAN	88	PR D38 2695	D.M. Coffman <i>et al.</i>	(Mark III Collab.)
FALVARD	88	PR D38 2706	A. Falvard <i>et al.</i>	(CLER, FRAS, LALO+)
AUGUSTIN	87	ZPHY C36 369	J.E. Augustin <i>et al.</i>	(LALO, CLER, FRAS+)
BAGLIN	87	NP B286 592	C. Baglin <i>et al.</i>	(LAPP, CERN, GENO, LYON+)
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	PRL 52 2126	R.M. Baltrusaitis <i>et al.</i>	(CIT, UCSC+)
EATON	84	PR D29 804	M.W. Eaton <i>et al.</i>	(LBL, SLAC)
BLOOM	83	ARNS 33 143	E.D. Bloom, C. Peck	(SLAC, CIT)
EDWARDS	83B	PRL 51 859	C. Edwards <i>et al.</i>	(CIT, HARV, PRIN+)
FRANKLIN	83	PRL 51 963	M.E.B. Franklin <i>et al.</i>	(LBL, SLAC)
BURKE	82	PRL 49 632	D.L. Burke <i>et al.</i>	(LBL, SLAC)
EDWARDS	82B	PR D25 3065	C. Edwards <i>et al.</i>	(CIT, HARV, PRIN+)
EDWARDS	82D	PRL 48 458	C. Edwards <i>et al.</i>	(CIT, HARV, PRIN+)
Also		ARNS 33 143	E.D. Bloom, C. Peck	(SLAC, CIT)
EDWARDS	82E	PRL 49 259	C. Edwards <i>et al.</i>	(CIT, HARV, PRIN+)
LEMOIGNE	82	PL 113B 509	Y. Lemoigne <i>et al.</i>	(SACL, LOIC, SHMP+)

BESCH	81	ZPHY C8 1	H.J. Besch <i>et al.</i>	(BONN, DESY, MANZ)
GIDAL	81	PL 107B 153	G. Gidal <i>et al.</i>	(SLAC, LBL)
PARTRIDGE	80	PRL 44 712	R. Partridge <i>et al.</i>	(CIT, HARV, PRIN+)
SCHARRE	80	PL 97B 329	D.L. Scharre <i>et al.</i>	(SLAC, LBL)
ZHOLENTZ	80	PL 96B 214	A.A. Zholents <i>et al.</i>	(NOVO)
Also		SJNP 34 814	A.A. Zholents <i>et al.</i>	(NOVO)
		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, MANZ)
BRANDELIK	78B	PL 74B 292	R. Brandelik <i>et al.</i>	(DASP Collab.)
PERUZZI	78	PR D17 2901	I. Peruzzi <i>et al.</i>	(SLAC, LBL)
BARTEL	77	PL 66B 489	W. Bartel <i>et al.</i>	(DESY, HEIDP)
BURMESTER	77D	PL 72B 135	J. Burmester <i>et al.</i>	(DESY, HAMB, SIEG+)
FELDMAN	77	PRPL 33C 285	G.J. Feldman, M.L. Perl	(LBL, SLAC)
VANNUCCI	77	PR D15 1814	F. Vannucci <i>et al.</i>	(SLAC, LBL)
BARTEL	76	PL 64B 483	W. Bartel <i>et al.</i>	(DESY, HEIDP)
BRAUNSCH...	76	PL 63B 487	W. Braunschweig <i>et al.</i>	(DASP Collab.)
JEAN-MARIE	76	PRL 36 291	B. Jean-Marie <i>et al.</i>	(SLAC, LBL) IG
BALDINI-...	75	PL 58B 471	R. Baldini-Celio <i>et al.</i>	(FRAS, ROMA)
BOYARSKI	75	PRL 34 1357	A.M. Boyarski <i>et al.</i>	(SLAC, LBL) JPC
DASP	75	PL 56B 491	W. Braunschweig <i>et al.</i>	(DASP Collab.)
ESPOSITO	75B	LNC 14 73	B. Esposito <i>et al.</i>	(FRAS, NAPL, PADO+)
FORD	75	PRL 34 604	R.L. Ford <i>et al.</i>	(SLAC, PENN)

OTHER RELATED PAPERS

ABLIKIM	06A	PL B633 19	M. Ablikim <i>et al.</i>	(BES Collab.)
ABLIKIM	06B	EPJ C45 337	M. Ablikim <i>et al.</i>	(BES Collab.)
GLOZMAN	06	PR D73 017503	L.Ya. Glozman	
ABLIKIM	04J	PRL 93 112002	M. Ablikim <i>et al.</i>	(BES Collab.)
DATTA	03B	PL B567 273	A. Datta, P.J. O'Donnell	
LI	03C	EPJ C28 335	D.M. Li <i>et al.</i>	
LI	03D	IJMP A18 3335	D.M. Li <i>et al.</i>	
BAI	01B	PL B510 75	J.Z. Bai <i>et al.</i>	(BEPC BES Collab.)
CHEN	98	PRL 80 5060	Y.Q. Chen, E. Braaten	
SUZUKI	98	PR D57 5717	M. Suzuki	
BARATE	83	PL 121B 449	R. Barate <i>et al.</i>	(SACL, LOIC, SHMP, IND)
ABRAMS	74	PRL 33 1453	G.S. Abrams <i>et al.</i>	(LBL, SLAC)
ASH	74	LNC 11 705	W.W. Ash <i>et al.</i>	(FRAS, UMD, NAPL, PADO+)
AUBERT	74	PRL 33 1404	J.J. Aubert <i>et al.</i>	(MIT, BNL)
AUGUSTIN	74	PRL 33 1406	J.E. Augustin <i>et al.</i>	(SLAC, LBL)
BACCI	74	PRL 33 1408	C. Bacci <i>et al.</i>	(FRAS)
Also		PRL 33 1649 (erratum)	C. Bacci	
BALDINI-...	74	LNC 11 711	R. Baldini-Celio <i>et al.</i>	(FRAS, ROMA)
BARBIELLINI	74	LNC 11 718	G. Barbiellini <i>et al.</i>	(FRAS, NAPL, PISA+)
BRAUNSCH...	74	PL 53B 393	W. Braunschweig <i>et al.</i>	(DASP Collab.)
CHRISTENS...	70	PRL 25 1523	J.C. Christenson <i>et al.</i>	(COLU, BNL, CERN)