

$\chi_{c0}(1P)$

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

$\chi_{c0}(1P)$ MASS

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
3414.75 ± 0.31 OUR AVERAGE				
3414.2 ± 0.5 ± 2.3	5.4k	UEHARA	08 BELL	$\gamma\gamma \rightarrow \chi_{c0} \rightarrow \text{hadrons}$
3406 ± 7 ± 6	230	¹ ABE	07 BELL	$e^+e^- \rightarrow J/\psi(c\bar{c})$
3414.21 ± 0.39 ± 0.27		ABLIKIM	05G BES2	$\psi(2S) \rightarrow \gamma\chi_{c0}$
3414.7 ^{+0.7} _{-0.6} ± 0.2		² ANDREOTTI	03 E835	$\bar{p}p \rightarrow \chi_{c0} \rightarrow \pi^0\pi^0$
3415.5 ± 0.4 ± 0.4	392	³ BAGNASCO	02 E835	$\bar{p}p \rightarrow \chi_{c0} \rightarrow J/\psi\gamma$
3417.4 ^{+1.8} _{-1.9} ± 0.2		² AMBROGIANI	99B E835	$\bar{p}p \rightarrow e^+e^-\gamma$
3414.1 ± 0.6 ± 0.8		BAI	99B BES	$\psi(2S) \rightarrow \gamma X$
3417.8 ± 0.4 ± 4		² GAISER	86 CBAL	$\psi(2S) \rightarrow \gamma X$
3416 ± 3 ± 4		⁴ TANENBAUM	78 MRK1	e^+e^-
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
3414.6 ± 1.1	266	UEHARA	13 BELL	$\gamma\gamma \rightarrow K_S^0 K_S^0$
3416.5 ± 3.0		EISENSTEIN	01 CLE2	$e^+e^- \rightarrow e^+e^-\chi_{c0}$
3422 ± 10		⁴ BARTEL	78B CNTR	$e^+e^- \rightarrow J/\psi 2\gamma$
3415 ± 9		⁴ BIDDICK	77 CNTR	$e^+e^- \rightarrow \gamma X$

¹ From a fit of the J/ψ recoil mass spectrum. Supersedes ABE,K 02 and ABE 04G.

² Using mass of $\psi(2S) = 3686.0$ MeV.

³ Recalculated by ANDREOTTI 05A, using the value of $\psi(2S)$ mass from AULCHENKO 03.

⁴ Mass value shifted by us by amount appropriate for $\psi(2S)$ mass = 3686 MeV and $J/\psi(1S)$ mass = 3097 MeV.

$\chi_{c0}(1P)$ WIDTH

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
10.5 ± 0.6 OUR FIT				
10.5 ± 0.8 OUR AVERAGE Error includes scale factor of 1.1.				
10.6 ± 1.9 ± 2.6	5.4k	UEHARA	08 BELL	$\gamma\gamma \rightarrow \chi_{c0} \rightarrow \text{hadrons}$
12.6 ^{+1.5+0.9} _{-1.6-1.1}		ABLIKIM	05G BES2	$\psi(2S) \rightarrow \gamma\chi_{c0}$
8.6 ^{+1.7} _{-1.3} ± 0.1		ANDREOTTI	03 E835	$\bar{p}p \rightarrow \chi_{c0} \rightarrow \pi^0\pi^0$
9.7 ± 1.0	392	¹ BAGNASCO	02 E835	$\bar{p}p \rightarrow \chi_{c0} \rightarrow J/\psi\gamma$
16.6 ^{+5.2} _{-3.7} ± 0.1		AMBROGIANI	99B E835	$\bar{p}p \rightarrow e^+e^-\gamma$
14.3 ± 2.0 ± 3.0		BAI	98I BES	$\psi(2S) \rightarrow \gamma\pi^+\pi^-$
13.5 ± 3.3 ± 4.2		GAISER	86 CBAL	$\psi(2S) \rightarrow \gamma X, \gamma\pi^0\pi^0$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
13.2 ± 2.1	266	UEHARA	13 BELL	$\gamma\gamma \rightarrow K_S^0 K_S^0$

¹ Recalculated by ANDREOTTI 05A.

$\chi_{c0}(1P)$ DECAY MODES

Mode	Fraction (Γ_i/Γ)	Scale factor/ Confidence level
Hadronic decays		
Γ_1 $2(\pi^+\pi^-)$	$(2.24 \pm 0.18) \%$	
Γ_2 $\rho^0\pi^+\pi^-$	$(8.7 \pm 2.8) \times 10^{-3}$	
Γ_3 $\rho^0\rho^0$		
Γ_4 $f_0(980)f_0(980)$	$(6.5 \pm 2.1) \times 10^{-4}$	
Γ_5 $\pi^+\pi^-\pi^0\pi^0$	$(3.3 \pm 0.4) \%$	
Γ_6 $\rho^+\pi^-\pi^0 + \text{c.c.}$	$(2.8 \pm 0.4) \%$	
Γ_7 $4\pi^0$	$(3.2 \pm 0.4) \times 10^{-3}$	
Γ_8 $\pi^+\pi^-K^+K^-$	$(1.75 \pm 0.14) \%$	
Γ_9 $K_0^*(1430)^0\bar{K}_0^*(1430)^0 \rightarrow \pi^+\pi^-K^+K^-$	$(9.6 \begin{smallmatrix} +3.5 \\ -2.8 \end{smallmatrix}) \times 10^{-4}$	
Γ_{10} $K_0^*(1430)^0\bar{K}_2^*(1430)^0 + \text{c.c.} \rightarrow \pi^+\pi^-K^+K^-$	$(7.8 \begin{smallmatrix} +1.9 \\ -2.4 \end{smallmatrix}) \times 10^{-4}$	
Γ_{11} $K_1(1270)^+K^- + \text{c.c.} \rightarrow \pi^+\pi^-K^+K^-$	$(6.1 \pm 1.9) \times 10^{-3}$	
Γ_{12} $K_1(1400)^+K^- + \text{c.c.} \rightarrow \pi^+\pi^-K^+K^-$	$< 2.6 \times 10^{-3}$	CL=90%
Γ_{13} $f_0(980)f_0(980)$	$(1.6 \begin{smallmatrix} +1.0 \\ -0.9 \end{smallmatrix}) \times 10^{-4}$	
Γ_{14} $f_0(980)f_0(2200)$	$(7.8 \begin{smallmatrix} +2.0 \\ -2.5 \end{smallmatrix}) \times 10^{-4}$	
Γ_{15} $f_0(1370)f_0(1370)$	$< 2.7 \times 10^{-4}$	CL=90%
Γ_{16} $f_0(1370)f_0(1500)$	$< 1.7 \times 10^{-4}$	CL=90%
Γ_{17} $f_0(1370)f_0(1710)$	$(6.6 \begin{smallmatrix} +3.5 \\ -2.3 \end{smallmatrix}) \times 10^{-4}$	
Γ_{18} $f_0(1500)f_0(1370)$	$< 1.3 \times 10^{-4}$	CL=90%
Γ_{19} $f_0(1500)f_0(1500)$	$< 5 \times 10^{-5}$	CL=90%
Γ_{20} $f_0(1500)f_0(1710)$	$< 7 \times 10^{-5}$	CL=90%
Γ_{21} $K^+K^-\pi^+\pi^-\pi^0$	$(1.11 \pm 0.26) \%$	
Γ_{22} $K^+K^-\pi^0\pi^0$	$(5.4 \pm 0.9) \times 10^{-3}$	
Γ_{23} $K^+\pi^-\bar{K}^0\pi^0 + \text{c.c.}$	$(2.44 \pm 0.33) \%$	
Γ_{24} $\rho^+K^-K^0 + \text{c.c.}$	$(1.18 \pm 0.21) \%$	
Γ_{25} $K^*(892)^-K^+\pi^0 \rightarrow K^+\pi^-\bar{K}^0\pi^0 + \text{c.c.}$	$(4.5 \pm 1.1) \times 10^{-3}$	
Γ_{26} $K_S^0K_S^0\pi^+\pi^-$	$(5.6 \pm 1.0) \times 10^{-3}$	
Γ_{27} $K^+K^-\eta\pi^0$	$(3.0 \pm 0.7) \times 10^{-3}$	
Γ_{28} $3(\pi^+\pi^-)$	$(1.20 \pm 0.18) \%$	
Γ_{29} $K^+\bar{K}^*(892)^0\pi^- + \text{c.c.}$	$(7.2 \pm 1.6) \times 10^{-3}$	
Γ_{30} $K^*(892)^0\bar{K}^*(892)^0$	$(1.7 \pm 0.6) \times 10^{-3}$	
Γ_{31} $\pi\pi$	$(8.33 \pm 0.35) \times 10^{-3}$	
Γ_{32} $\pi^0\eta$	$< 1.8 \times 10^{-4}$	
Γ_{33} $\pi^0\eta'$	$< 1.1 \times 10^{-3}$	

Γ_{34}	$\eta\eta$	$(2.95 \pm 0.19) \times 10^{-3}$	
Γ_{35}	$\eta\eta'$	$< 2.3 \times 10^{-4}$	CL=90%
Γ_{36}	$\eta'\eta'$	$(1.96 \pm 0.21) \times 10^{-3}$	
Γ_{37}	$\omega\omega$	$(9.5 \pm 1.1) \times 10^{-4}$	
Γ_{38}	$\omega\phi$	$(1.16 \pm 0.21) \times 10^{-4}$	
Γ_{39}	K^+K^-	$(5.91 \pm 0.32) \times 10^{-3}$	
Γ_{40}	$K_S^0 K_S^0$	$(3.10 \pm 0.18) \times 10^{-3}$	
Γ_{41}	$\pi^+\pi^-\eta$	$< 1.9 \times 10^{-4}$	CL=90%
Γ_{42}	$\pi^+\pi^-\eta'$	$< 3.5 \times 10^{-4}$	CL=90%
Γ_{43}	$\bar{K}^0 K^+ \pi^- + \text{c.c.}$	$< 9 \times 10^{-5}$	CL=90%
Γ_{44}	$K^+K^-\pi^0$	$< 6 \times 10^{-5}$	CL=90%
Γ_{45}	$K^+K^-\eta$	$< 2.2 \times 10^{-4}$	CL=90%
Γ_{46}	$K^+K^-\bar{K}_S^0 K_S^0$	$(1.4 \pm 0.5) \times 10^{-3}$	
Γ_{47}	$K^+K^-\bar{K}^+ K^-$	$(2.75 \pm 0.28) \times 10^{-3}$	
Γ_{48}	$K^+K^-\phi$	$(9.5 \pm 2.4) \times 10^{-4}$	
Γ_{49}	$\phi\phi$	$(7.7 \pm 0.7) \times 10^{-4}$	
Γ_{50}	$\rho\bar{\rho}$	$(2.25 \pm 0.09) \times 10^{-4}$	
Γ_{51}	$\rho\bar{\rho}\pi^0$	$(6.8 \pm 0.7) \times 10^{-4}$	S=1.3
Γ_{52}	$\rho\bar{\rho}\eta$	$(3.5 \pm 0.4) \times 10^{-4}$	
Γ_{53}	$\rho\bar{\rho}\omega$	$(5.1 \pm 0.6) \times 10^{-4}$	
Γ_{54}	$\rho\bar{\rho}\phi$	$(5.9 \pm 1.4) \times 10^{-5}$	
Γ_{55}	$\rho\bar{\rho}\pi^+\pi^-$	$(2.1 \pm 0.7) \times 10^{-3}$	S=1.4
Γ_{56}	$\rho\bar{\rho}\pi^0\pi^0$	$(1.02 \pm 0.27) \times 10^{-3}$	
Γ_{57}	$\rho\bar{\rho}K^+K^-$ (non-resonant)	$(1.19 \pm 0.26) \times 10^{-4}$	
Γ_{58}	$\rho\bar{\rho}K_S^0 K_S^0$	$< 8.8 \times 10^{-4}$	CL=90%
Γ_{59}	$\rho\bar{n}\pi^-$	$(1.24 \pm 0.11) \times 10^{-3}$	
Γ_{60}	$\bar{\rho}n\pi^+$	$(1.34 \pm 0.12) \times 10^{-3}$	
Γ_{61}	$\rho\bar{n}\pi^-\pi^0$	$(2.29 \pm 0.21) \times 10^{-3}$	
Γ_{62}	$\bar{\rho}n\pi^+\pi^0$	$(2.16 \pm 0.18) \times 10^{-3}$	
Γ_{63}	$\Lambda\bar{\Lambda}$	$(3.21 \pm 0.25) \times 10^{-4}$	
Γ_{64}	$\Lambda\bar{\Lambda}\pi^+\pi^-$	$(1.15 \pm 0.13) \times 10^{-3}$	
Γ_{65}	$\Lambda\bar{\Lambda}\pi^+\pi^-$ (non-resonant)	$< 5 \times 10^{-4}$	CL=90%
Γ_{66}	$\Sigma(1385)^+\bar{\Lambda}\pi^- + \text{c.c.}$	$< 5 \times 10^{-4}$	CL=90%
Γ_{67}	$\Sigma(1385)^-\bar{\Lambda}\pi^+ + \text{c.c.}$	$< 5 \times 10^{-4}$	CL=90%
Γ_{68}	$K^+\bar{\rho}\Lambda + \text{c.c.}$	$(1.22 \pm 0.12) \times 10^{-3}$	S=1.3
Γ_{69}	$K^+\bar{\rho}\Lambda(1520) + \text{c.c.}$	$(2.9 \pm 0.7) \times 10^{-4}$	
Γ_{70}	$\Lambda(1520)\bar{\Lambda}(1520)$	$(3.1 \pm 1.2) \times 10^{-4}$	
Γ_{71}	$\Sigma^0\bar{\Sigma}^0$	$(4.4 \pm 0.4) \times 10^{-4}$	
Γ_{72}	$\Sigma^+\bar{\Sigma}^-$	$(3.9 \pm 0.7) \times 10^{-4}$	S=1.7
Γ_{73}	$\Sigma(1385)^+\bar{\Sigma}(1385)^-$	$(1.6 \pm 0.6) \times 10^{-4}$	
Γ_{74}	$\Sigma(1385)^-\bar{\Sigma}(1385)^+$	$(2.3 \pm 0.6) \times 10^{-4}$	
Γ_{75}	$\Xi^0\bar{\Xi}^0$	$(3.1 \pm 0.8) \times 10^{-4}$	
Γ_{76}	$\Xi^-\bar{\Xi}^+$	$(4.7 \pm 0.7) \times 10^{-4}$	

Radiative decays

Γ_{77}	$\gamma J/\psi(1S)$	$(1.27 \pm 0.06) \%$	
Γ_{78}	$\gamma \rho^0$	< 9	$\times 10^{-6}$ CL=90%
Γ_{79}	$\gamma \omega$	< 8	$\times 10^{-6}$ CL=90%
Γ_{80}	$\gamma \phi$	< 6	$\times 10^{-6}$ CL=90%
Γ_{81}	$\gamma \gamma$	$(2.23 \pm 0.13) \times 10^{-4}$	

CONSTRAINED FIT INFORMATION

A multiparticle fit to $\chi_{c1}(1P)$, $\chi_{c0}(1P)$, $\chi_{c2}(1P)$, and $\psi(2S)$ with 4 total widths, a partial width, 25 combinations of partial widths obtained from integrated cross section, and 84 branching ratios uses 239 measurements to determine 49 parameters. The overall fit has a $\chi^2 = 341.3$ for 190 degrees of freedom.

The following *off-diagonal* array elements are the correlation coefficients $\langle \delta p_i \delta p_j \rangle / (\delta p_i \cdot \delta p_j)$, in percent, from the fit to parameters p_i , including the branching fractions, $x_i \equiv \Gamma_i / \Gamma_{\text{total}}$.

x_2	25									
x_8	14	4								
x_{29}	7	2	29							
x_{31}	15	4	16	5						
x_{34}	8	2	9	3	21					
x_{39}	13	3	14	5	28	17				
x_{40}	12	3	13	4	27	16	22			
x_{47}	9	2	8	3	14	8	12	11		
x_{49}	10	3	10	4	14	9	12	12	7	
x_{50}	7	2	9	3	13	6	15	15	8	8
x_{63}	8	2	9	3	20	12	17	16	8	9
x_{77}	4	1	5	1	14	9	10	10	5	5
x_{81}	-16	-4	-9	-6	5	4	2	4	-2	-4
Γ	-22	-6	-17	-8	-16	-9	-15	-14	-10	-13
	x_1	x_2	x_8	x_{29}	x_{31}	x_{34}	x_{39}	x_{40}	x_{47}	x_{49}
x_{63}	11									
x_{77}	-21	8								
x_{81}	2	4	9							
Γ	-7	-9	-8	-48						
	x_{50}	x_{63}	x_{77}	x_{81}						

$\chi_{c0}(1P)$ PARTIAL WIDTHS

———— $\chi_{c0}(1P) \Gamma(i)\Gamma(\gamma J/\psi(1S))/\Gamma(\text{total})$ ————

$\Gamma(p\bar{p}) \times \Gamma(\gamma J/\psi(1S))/\Gamma_{\text{total}}$ $\Gamma_{50}\Gamma_{77}/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
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30.0 ± 2.3 OUR FIT

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

26.6 ± 2.6 ± 1.4	392	1,2 BAGNASCO	02	E835	$\bar{p}p \rightarrow \chi_{c0} \rightarrow J/\psi\gamma$
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48.7 ^{+11.3} _{-8.9} ± 2.4	1,2	AMBROGIANI	99B	E835	$\bar{p}p \rightarrow \gamma J/\psi$
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¹ Calculated by us using $B(J/\psi(1S) \rightarrow e^+e^-) = 0.0593 \pm 0.0010$.

² Values in $(\Gamma(p\bar{p}) \times \Gamma(\gamma J/\psi(1S))/\Gamma_{\text{total}})$ and $(\Gamma(p\bar{p})/\Gamma_{\text{total}} \times \Gamma(\gamma J/\psi(1S))/\Gamma_{\text{total}})$ are not independent. The latter is used in the fit since it is less correlated to the total width.

———— $\chi_{c0}(1P) \Gamma(i)\Gamma(\gamma\gamma)/\Gamma(\text{total})$ ————

$\Gamma(2(\pi^+\pi^-)) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ $\Gamma_1\Gamma_{81}/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
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52 ± 4 OUR FIT

49 ± 10 OUR AVERAGE Error includes scale factor of 1.8.

44.7 ± 3.6 ± 4.9	3.6k	UEHARA	08	BELL	$\gamma\gamma \rightarrow \chi_{c0} \rightarrow 2(\pi^+\pi^-)$
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75 ± 13 ± 8		EISENSTEIN	01	CLE2	$e^+e^- \rightarrow e^+e^-\chi_{c0}$
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$\Gamma(\rho^0\rho^0) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ $\Gamma_3\Gamma_{81}/\Gamma$

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

<12	90	<252	UEHARA	08	BELL $\gamma\gamma \rightarrow \chi_{c0} \rightarrow 2(\pi^+\pi^-)$
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$\Gamma(\pi^+\pi^-K^+K^-) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ $\Gamma_8\Gamma_{81}/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
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41 ± 4 OUR FIT

38.8 ± 3.7 ± 4.7	1.7k	UEHARA	08	BELL	$\gamma\gamma \rightarrow \chi_{c0} \rightarrow K^+K^-\pi^+\pi^-$
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$\Gamma(K^+K^-\pi^+\pi^-\pi^0) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ $\Gamma_{21}\Gamma_{81}/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
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26 ± 4 ± 4	1094	DEL-AMO-SA..11M	BABR	$\gamma\gamma \rightarrow K^+K^-\pi^+\pi^-\pi^0$
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$\Gamma(K^+\bar{K}^*(892)^0\pi^- + \text{c.c.}) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ $\Gamma_{29}\Gamma_{81}/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
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17 ± 4 OUR FIT

16.7 ± 6.1 ± 3.0	495 ± 182	UEHARA	08	BELL	$\gamma\gamma \rightarrow \chi_{c0} \rightarrow K^+K^-\pi^+\pi^-$
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$\Gamma(K^*(892)^0\bar{K}^*(892)^0) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ $\Gamma_{30}\Gamma_{81}/\Gamma$

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

<6	90	<148	UEHARA	08	BELL $\gamma\gamma \rightarrow \chi_{c0} \rightarrow K^+K^-\pi^+\pi^-$
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$\Gamma(\pi\pi) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ $\Gamma_{31}\Gamma_{81}/\Gamma$

<u>VALUE (eV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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19.5 ± 1.4 OUR FIT
23 ± 5 OUR AVERAGE

29.7 ^{+17.4} _{-12.0} ± 4.8	103 ⁺⁶⁰ ₋₄₂	¹ UEHARA	09 BELL	10.6 e ⁺ e ⁻ → e ⁺ e ⁻ π ⁰ π ⁰
22.7 ± 3.2 ± 3.5	129 ± 18	² NAKAZAWA	05 BELL	10.6 e ⁺ e ⁻ → e ⁺ e ⁻ π ⁺ π ⁻

¹We multiplied the measurement by 3 to convert from π⁰π⁰ to ππ. Interference with the continuum included.
²We have multiplied π⁺π⁻ measurement by 3/2 to obtain ππ.

$\Gamma(\eta\eta) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ $\Gamma_{34}\Gamma_{81}/\Gamma$

<u>VALUE (eV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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9.4 ± 2.3 ± 1.2 22 ¹ UEHARA 10A BELL 10.6 e⁺e⁻ → e⁺e⁻ηη

¹Interference with the continuum not included.

$\Gamma(\omega\omega) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ $\Gamma_{37}\Gamma_{81}/\Gamma$

<u>VALUE (eV)</u>	<u>CL%</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. • • •

<3.9	90	¹ LIU	12B BELL	γγ → 2(π ⁺ π ⁻ π ⁰)
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¹Using B(ω → π⁺π⁻π⁰) = (89.2 ± 0.7)%.

$\Gamma(\omega\phi) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ $\Gamma_{38}\Gamma_{81}/\Gamma$

<u>VALUE (eV)</u>	<u>CL%</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. • • •

<0.34	90	¹ LIU	12B BELL	γγ → K ⁺ K ⁻ π ⁺ π ⁻ π ⁰
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¹Using B(φ → K⁺K⁻) = (48.9 ± 0.5)% and B(ω → π⁺π⁻π⁰) = (89.2 ± 0.7)%.

$\Gamma(K^+K^-) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ $\Gamma_{39}\Gamma_{81}/\Gamma$

<u>VALUE (eV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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13.9 ± 1.1 OUR FIT

14.3 ± 1.6 ± 2.3 153 ± 17 NAKAZAWA 05 BELL 10.6 e⁺e⁻ → e⁺e⁻K⁺K⁻

$\Gamma(K_S^0 K_S^0) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ $\Gamma_{40}\Gamma_{81}/\Gamma$

<u>VALUE (eV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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7.3 ± 0.6 OUR FIT

8.7 ± 1.7 ± 0.9 266 ¹ UEHARA 13 BELL γγ → K_S⁰K_S⁰

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

7.00 ± 0.65 ± 0.71	134 ± 12	CHEN	07B BELL	e ⁺ e ⁻ → e ⁺ e ⁻ χ _{c0}
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¹Supersedes CHEN 07B.

$\Gamma(K^+K^-K^+K^-) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ $\Gamma_{47}\Gamma_{81}/\Gamma$

<u>VALUE (eV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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6.4 ± 0.7 OUR FIT

7.9 ± 1.3 ± 1.1 215 ± 36 UEHARA 08 BELL γγ → χ_{c0} → 2(K⁺K⁻)

$\Gamma(\phi\phi) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$			$\Gamma_{49}\Gamma_{81}/\Gamma$		
<u>VALUE (eV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
1.82±0.19 OUR FIT					
1.72±0.33±0.14	56 ± 11	¹ LIU	12B	BELL	$\gamma\gamma \rightarrow 2(K^+K^-)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
2.3 ± 0.9 ± 0.4	23.6 ± 9.6	UEHARA	08	BELL	$\gamma\gamma \rightarrow \chi_{c0} \rightarrow 2(K^+K^-)$
¹ Supersedes UEHARA 08. Using $B(\phi \rightarrow K^+K^-) = (48.9 \pm 0.5)\%$.					

$\chi_{c0}(1P)$ BRANCHING RATIOS

HADRONIC DECAYS

$\Gamma(2(\pi^+\pi^-))/\Gamma_{\text{total}}$		Γ_1/Γ
<u>VALUE</u>	<u>DOCUMENT ID</u>	
0.0224±0.0018 OUR FIT		

$\Gamma(\rho^0\pi^+\pi^-)/\Gamma(2(\pi^+\pi^-))$		Γ_2/Γ_1	
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.39±0.12 OUR FIT			
0.39±0.12	TANENBAUM	78	MRK1 $\psi(2S) \rightarrow \gamma\chi_{c0}$

$\Gamma(\rho^0\pi^+\pi^-)/\Gamma_{\text{total}}$		Γ_2/Γ
<u>VALUE</u>	<u>DOCUMENT ID</u>	
0.0087±0.0028 OUR FIT		

$\Gamma(f_0(980)f_0(980))/\Gamma_{\text{total}}$			Γ_4/Γ	
<u>VALUE (units 10⁻⁴)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
6.5±2.1±0.2	36 ± 9	¹ ABLIKIM	04G	BES $\psi(2S) \rightarrow \gamma 2\pi^+ 2\pi^-$

¹ ABLIKIM 04G reports $[\Gamma(\chi_{c0}(1P) \rightarrow f_0(980)f_0(980))/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))]$ = $(6.5 \pm 1.6 \pm 1.3) \times 10^{-5}$ which we divide by our best value $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\pi^+\pi^-\pi^0\pi^0)/\Gamma_{\text{total}}$		Γ_5/Γ		
<u>VALUE (%)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
3.3±0.4±0.1	1751.4	¹ HE	08B	CLEO $e^+e^- \rightarrow \gamma h^+ h^- h^0 h^0$

¹ HE 08B reports $3.54 \pm 0.10 \pm 0.43 \pm 0.18 \%$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow \pi^+\pi^-\pi^0\pi^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\rho^+\pi^-\pi^0 + \text{c.c.})/\Gamma_{\text{total}}$		Γ_6/Γ		
<u>VALUE (%)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
2.8±0.4±0.1	1358.5	^{1,2} HE	08B	CLEO $e^+e^- \rightarrow \gamma h^+ h^- h^0 h^0$

¹ HE 08B reports $3.04 \pm 0.18 \pm 0.42 \pm 0.16$ % from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow \rho^+ \pi^- \pi^0 + \text{c.c.})/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

² Calculated by us. We have added the values from HE 08B for $\rho^+ \pi^- \pi^0$ and $\rho^- \pi^+ \pi^0$ decays assuming uncorrelated statistical and fully correlated systematic uncertainties.

$\Gamma(4\pi^0)/\Gamma_{\text{total}}$ Γ_7/Γ

<u>VALUE (units 10^{-3})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$3.2 \pm 0.4 \pm 0.1$	3296	¹ ABLIKIM	11A BES3	$e^+ e^- \rightarrow \psi(2S) \rightarrow \gamma \chi_{c0}$

¹ ABLIKIM 11A reports $(3.34 \pm 0.06 \pm 0.44) \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow 4\pi^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.62 \pm 0.31) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\pi^+ \pi^- K^+ K^-)/\Gamma_{\text{total}}$ Γ_8/Γ

<u>VALUE (units 10^{-3})</u>	<u>DOCUMENT ID</u>
17.5 ± 1.4 OUR FIT	

$\Gamma(K^+ \bar{K}^*(892)^0 \pi^- + \text{c.c.})/\Gamma(\pi^+ \pi^- K^+ K^-)$ Γ_{29}/Γ_8

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.41 ± 0.09 OUR FIT			
0.41 ± 0.10	TANENBAUM 78	MRK1	$\psi(2S) \rightarrow \gamma \chi_{c0}$

$\Gamma(K_0^*(1430)^0 \bar{K}_0^*(1430)^0 \rightarrow \pi^+ \pi^- K^+ K^-)/\Gamma_{\text{total}}$ Γ_9/Γ

<u>VALUE (units 10^{-4})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$9.6^{+3.5}_{-2.8} \pm 0.3$	83	¹ ABLIKIM	05Q BES2	$\psi(2S) \rightarrow \gamma \pi^+ \pi^- K^+ K^-$

¹ ABLIKIM 05Q reports $(10.44 \pm 2.37^{+3.05}_{-1.90}) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow K_0^*(1430)^0 \bar{K}_0^*(1430)^0 \rightarrow \pi^+ \pi^- K^+ K^-)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(K_0^*(1430)^0 \bar{K}_2^*(1430)^0 + \text{c.c.} \rightarrow \pi^+ \pi^- K^+ K^-)/\Gamma_{\text{total}}$ Γ_{10}/Γ

<u>VALUE (units 10^{-4})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$7.8^{+1.9}_{-2.4} \pm 0.2$	62	¹ ABLIKIM	05Q BES2	$\psi(2S) \rightarrow \gamma \pi^+ \pi^- K^+ K^-$

¹ ABLIKIM 05Q reports $(8.49 \pm 1.66^{+1.32}_{-1.99}) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow K_0^*(1430)^0 \bar{K}_2^*(1430)^0 + \text{c.c.} \rightarrow \pi^+ \pi^- K^+ K^-)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$$\Gamma(K_1(1270)^+ K^- + \text{c.c.} \rightarrow \pi^+ \pi^- K^+ K^-) / \Gamma_{\text{total}} \quad \Gamma_{11} / \Gamma$$

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
$6.1^{+1.9}_{-1.8} \pm 0.2$	68	¹ ABLIKIM	05Q BES2	$\psi(2S) \rightarrow \gamma \pi^+ \pi^- K^+ K^-$

¹ ABLIKIM 05Q reports $(6.66 \pm 1.31^{+1.60}_{-1.51}) \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow K_1(1270)^+ K^- + \text{c.c.} \rightarrow \pi^+ \pi^- K^+ K^-) / \Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. The measurement assumes $B(K_1(1270) \rightarrow K \rho(770)) = 42 \pm 6\%$.

$$\Gamma(K_1(1400)^+ K^- + \text{c.c.} \rightarrow \pi^+ \pi^- K^+ K^-) / \Gamma_{\text{total}} \quad \Gamma_{12} / \Gamma$$

VALUE (units 10^{-3})	CL%	DOCUMENT ID	TECN	COMMENT
< 2.6	90	¹ ABLIKIM	05Q BES2	$\psi(2S) \rightarrow \gamma \pi^+ \pi^- K^+ K^-$

¹ ABLIKIM 05Q reports $< 2.85 \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow K_1(1400)^+ K^- + \text{c.c.} \rightarrow \pi^+ \pi^- K^+ K^-) / \Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = 9.99 \times 10^{-2}$. The measurement assumes $B(K_1(1400) \rightarrow K^*(892) \pi) = 94 \pm 6\%$.

$$\Gamma(f_0(980) f_0(980)) / \Gamma_{\text{total}} \quad \Gamma_{13} / \Gamma$$

VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT
$15.9^{+10.2}_{-8.8} \pm 0.4$	28	¹ ABLIKIM	05Q BES2	$\psi(2S) \rightarrow \gamma \pi^+ \pi^- K^+ K^-$

¹ ABLIKIM 05Q reports $[\Gamma(\chi_{c0}(1P) \rightarrow f_0(980) f_0(980)) / \Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))] = (1.59 \pm 0.50^{+0.89}_{-0.72}) \times 10^{-5}$ which we divide by our best value $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. One of the $f_0(980)$ mesons is identified via decay to $\pi^+ \pi^-$ while the other via $K^+ K^-$ decay.

$$\Gamma(f_0(980) f_0(2200)) / \Gamma_{\text{total}} \quad \Gamma_{14} / \Gamma$$

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
$7.8^{+2.0}_{-2.5} \pm 0.2$	77	¹ ABLIKIM	05Q BES2	$\psi(2S) \rightarrow \gamma \pi^+ \pi^- K^+ K^-$

¹ ABLIKIM 05Q reports $(8.42 \pm 1.42^{+1.65}_{-2.29}) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow f_0(980) f_0(2200)) / \Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. The f_0 mesons are identified via $f_0(980) \rightarrow \pi^+ \pi^-$ and $f_0(2200) \rightarrow K^+ K^-$ decays.

$$\Gamma(f_0(1370) f_0(1370)) / \Gamma_{\text{total}} \quad \Gamma_{15} / \Gamma$$

VALUE (units 10^{-4})	CL%	DOCUMENT ID	TECN	COMMENT
< 2.7	90	¹ ABLIKIM	05Q BES2	$\psi(2S) \rightarrow \gamma \pi^+ \pi^- K^+ K^-$

¹ ABLIKIM 05Q reports $< 2.9 \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow f_0(1370) f_0(1370))/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = 9.99 \times 10^{-2}$. One of the $f_0(1370)$ mesons is identified via decay to $\pi^+ \pi^-$ while the other via $K^+ K^-$ decay. Both branching fractions for these f_0 decays are implicitly included in the quoted result.

$\Gamma(f_0(1370) f_0(1500))/\Gamma_{\text{total}}$ Γ_{16}/Γ

<u>VALUE (units 10^{-4})</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<1.7	90	¹ ABLIKIM	05Q BES2	$\psi(2S) \rightarrow \gamma \pi^+ \pi^- K^+ K^-$
¹ ABLIKIM 05Q reports $< 1.8 \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow f_0(1370) f_0(1500))/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = 9.99 \times 10^{-2}$. The f_0 mesons are identified via $f_0(1370) \rightarrow \pi^+ \pi^-$ and $f_0(1500) \rightarrow K^+ K^-$ decays. Both branching fractions for these f_0 decays are implicitly included in the quoted result.				

$\Gamma(f_0(1370) f_0(1710))/\Gamma_{\text{total}}$ Γ_{17}/Γ

<u>VALUE (units 10^{-4})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$6.6^{+3.5}_{-2.3} \pm 0.2$	61	¹ ABLIKIM	05Q BES2	$\psi(2S) \rightarrow \gamma \pi^+ \pi^- K^+ K^-$
¹ ABLIKIM 05Q reports $(7.12 \pm 1.85^{+3.28}_{-1.68}) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow f_0(1370) f_0(1710))/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. The f_0 mesons are identified via $f_0(1370) \rightarrow \pi^+ \pi^-$ and $f_0(1710) \rightarrow K^+ K^-$ decays. Both branching fractions for these f_0 decays are implicitly included in the quoted result.				

$\Gamma(f_0(1500) f_0(1370))/\Gamma_{\text{total}}$ Γ_{18}/Γ

<u>VALUE (units 10^{-4})</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<1.3	90	¹ ABLIKIM	05Q BES2	$\psi(2S) \rightarrow \gamma \pi^+ \pi^- K^+ K^-$
¹ ABLIKIM 05Q reports $< 1.4 \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow f_0(1500) f_0(1370))/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = 9.99 \times 10^{-2}$. The f_0 mesons are identified via $f_0(1500) \rightarrow \pi^+ \pi^-$ and $f_0(1370) \rightarrow K^+ K^-$ decays. Both branching fractions for these f_0 decays are implicitly included in the quoted result.				

$\Gamma(f_0(1500) f_0(1500))/\Gamma_{\text{total}}$ Γ_{19}/Γ

<u>VALUE (units 10^{-4})</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<0.5	90	¹ ABLIKIM	05Q BES2	$\psi(2S) \rightarrow \gamma \pi^+ \pi^- K^+ K^-$
¹ ABLIKIM 05Q reports $< 0.55 \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow f_0(1500) f_0(1500))/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = 9.99 \times 10^{-2}$. One of the $f_0(1500)$ is identified via decay to $\pi^+ \pi^-$ while the other via $K^+ K^-$ decay. Both branching fractions for these f_0 decays are implicitly included in the quoted result.				

$\Gamma(f_0(1500)f_0(1710))/\Gamma_{\text{total}}$ **Γ_{20}/Γ**

<u>VALUE (units 10^{-4})</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<0.7	90	¹ ABLIKIM	05Q BES2	$\psi(2S) \rightarrow \gamma\pi^+\pi^-K^+K^-$

¹ ABLIKIM 05Q reports $< 0.73 \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow f_0(1500)f_0(1710))/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = 9.99 \times 10^{-2}$. The f_0 mesons are identified via $f_0(1500) \rightarrow \pi^+\pi^-$ and $f_0(1710) \rightarrow K^+K^-$ decays. Both branching fractions for these f_0 decays are implicitly included in the quoted result.

$\Gamma(K^+K^-\pi^0\pi^0)/\Gamma_{\text{total}}$ **Γ_{22}/Γ**

<u>VALUE (%)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$0.54 \pm 0.09 \pm 0.01$	213.5	¹ HE	08B CLEO	$e^+e^- \rightarrow \gamma h^+h^-h^0h^0$

¹ HE 08B reports $0.59 \pm 0.05 \pm 0.08 \pm 0.03$ % from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow K^+K^-\pi^0\pi^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

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

<u>VALUE (%)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$2.44 \pm 0.32 \pm 0.07$	401.7	¹ HE	08B CLEO	$e^+e^- \rightarrow \gamma h^+h^-h^0h^0$

¹ HE 08B reports $2.64 \pm 0.15 \pm 0.31 \pm 0.14$ % from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow K^+\pi^-\bar{K}^0\pi^0 + \text{c.c.})/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\rho^+K^-K^0 + \text{c.c.})/\Gamma_{\text{total}}$ **Γ_{24}/Γ**

<u>VALUE (%)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$1.18 \pm 0.20 \pm 0.03$	179.7	¹ HE	08B CLEO	$e^+e^- \rightarrow \gamma h^+h^-h^0h^0$

¹ HE 08B reports $1.28 \pm 0.16 \pm 0.15 \pm 0.07$ % from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow \rho^+K^-K^0 + \text{c.c.})/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

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

<u>VALUE (%)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$0.45 \pm 0.11 \pm 0.01$	64.1	¹ HE	08B CLEO	$e^+e^- \rightarrow \gamma h^+h^-h^0h^0$

¹ HE 08B reports $0.49 \pm 0.10 \pm 0.07 \pm 0.03$ % from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow K^*(892)^-K^+\pi^0 \rightarrow K^+\pi^-\bar{K}^0\pi^0 + \text{c.c.})/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(K_S^0 K_S^0 \pi^+ \pi^-) / \Gamma_{\text{total}}$ Γ_{26} / Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
5.6 ± 1.0 ± 0.2	152 ± 14	¹ ABLIKIM	050 BES2	$\psi(2S) \rightarrow \gamma \chi_{c0}$

¹ ABLIKIM 050 reports $[\Gamma(\chi_{c0}(1P) \rightarrow K_S^0 K_S^0 \pi^+ \pi^-) / \Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))] = (0.558 \pm 0.051 \pm 0.089) \times 10^{-3}$ which we divide by our best value $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(K^+ K^- \eta \pi^0) / \Gamma_{\text{total}}$ Γ_{27} / Γ

VALUE (%)	EVTS	DOCUMENT ID	TECN	COMMENT
0.30 ± 0.07 ± 0.01	56.4	¹ HE	08B CLEO	$e^+ e^- \rightarrow \gamma h^+ h^- h^0 h^0$

¹ HE 08B reports $0.32 \pm 0.05 \pm 0.05 \pm 0.02$ % from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow K^+ K^- \eta \pi^0) / \Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(3(\pi^+ \pi^-)) / \Gamma_{\text{total}}$ Γ_{28} / Γ

VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
12.0 ± 1.8 OUR EVALUATION	Treating systematic error as correlated.		
12.0 ± 1.7 OUR AVERAGE			

11.7 ± 1.0 ± 1.9

¹ BAI 99B BES $\psi(2S) \rightarrow \gamma \chi_{c0}$

12.5 ± 2.9 ± 0.5

¹ TANENBAUM 78 MRK1 $\psi(2S) \rightarrow \gamma \chi_{c0}$

¹ Rescaled by us using $B(\psi(2S) \rightarrow \gamma \chi_{c0}) = (9.4 \pm 0.4)\%$ and $B(\psi(2S) \rightarrow J/\psi(1S) \pi^+ \pi^-) = (32.6 \pm 0.5)\%$.

$\Gamma(K^+ \bar{K}^*(892)^0 \pi^- + \text{c.c.}) / \Gamma_{\text{total}}$ Γ_{29} / Γ

VALUE	DOCUMENT ID
0.0072 ± 0.0016 OUR FIT	

$\Gamma(K^*(892)^0 \bar{K}^*(892)^0) / \Gamma_{\text{total}}$ Γ_{30} / Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
1.68^{+0.59}_{-0.53} ± 0.05	64	¹ ABLIKIM	05Q BES2	$\psi(2S) \rightarrow \gamma \pi^+ \pi^- K^+ K^-$

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

1.53 ± 0.39 ± 0.04 30 ± 6 ^{2,3} ABLIKIM 04H BES Repl. by ABLIKIM 05Q

¹ ABLIKIM 05Q reports $[\Gamma(\chi_{c0}(1P) \rightarrow K^*(892)^0 \bar{K}^*(892)^0) / \Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))] = (0.168 \pm 0.035^{+0.047}_{-0.040}) \times 10^{-3}$ which we divide by our best value $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

² Assumes $B(K^*(892)^0 \rightarrow K^- \pi^+) = 2/3$.

³ ABLIKIM 04H reports $[\Gamma(\chi_{c0}(1P) \rightarrow K^*(892)^0 \bar{K}^*(892)^0) / \Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))] = (1.53 \pm 0.29 \pm 0.26) \times 10^{-4}$ which we divide by our best value $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\pi\pi)/\Gamma_{\text{total}}$	Γ_{31}/Γ
<u>VALUE (units 10^{-3})</u>	<u>DOCUMENT ID</u>
8.33±0.35 OUR FIT	

$\Gamma(\eta\eta)/\Gamma_{\text{total}}$	Γ_{34}/Γ
<u>VALUE (units 10^{-3})</u>	<u>DOCUMENT ID</u>
2.95±0.19 OUR FIT	

$\Gamma(\eta\eta)/\Gamma(\pi\pi)$	Γ_{34}/Γ_{31}
<u>VALUE</u>	<u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>
0.354±0.025 OUR FIT	

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

0.26 ±0.09	$^{+0.03}_{-0.02}$	1	ANDREOTTI	05C	E835	$\bar{p}p \rightarrow 2$ mesons
0.24 ±0.10	±0.08	1	BAI	03C	BES	$\psi(2S) \rightarrow 5\gamma$

¹ We have multiplied $\pi^0\pi^0$ measurement by 3 to obtain $\pi\pi$.

$\Gamma(\eta\eta')/\Gamma_{\text{total}}$	Γ_{35}/Γ
<u>VALUE (units 10^{-3})</u>	<u>CL%</u> <u>EVTS</u> <u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>

<0.23	90	35 ± 13	1	ASNER	09	CLEO $\psi(2S) \rightarrow \gamma\eta'\eta$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

<0.5	90		2	ADAMS	07	CLEO $\psi(2S) \rightarrow \gamma\chi_{c0}$
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¹ ASNER 09 reports $< 0.25 \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow \eta\eta')/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = 9.99 \times 10^{-2}$.

² Superseded by ASNER 09. ADAMS 07 reports $< 0.5 \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow \eta\eta')/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = 9.99 \times 10^{-2}$.

$\Gamma(\eta'\eta')/\Gamma_{\text{total}}$	Γ_{36}/Γ
<u>VALUE (units 10^{-3})</u>	<u>EVTS</u> <u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>

1.96±0.20±0.05	0.4k	1	ASNER	09	CLEO $\psi(2S) \rightarrow \gamma\eta'\eta'$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

1.57±0.40±0.04	23	2	ADAMS	07	CLEO $\psi(2S) \rightarrow \gamma\chi_{c0}$
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¹ ASNER 09 reports $(2.12 \pm 0.13 \pm 0.21) \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow \eta'\eta')/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

² Superseded by ASNER 09. ADAMS 07 reports $(1.7 \pm 0.4 \pm 0.2) \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow \eta'\eta')/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = 0.0922 \pm 0.0011 \pm 0.0046$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\omega\omega)/\Gamma_{\text{total}}$ Γ_{37}/Γ

<u>VALUE (units 10^{-3})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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0.95±0.11 OUR AVERAGE

0.91±0.11±0.02	991	¹ ABLIKIM	11K BES3	$\psi(2S) \rightarrow \gamma$ hadrons
2.1 ±0.6 ±0.1	38.1 ±9.6	² ABLIKIM	05N BES2	$\psi(2S) \rightarrow \gamma\chi_{c0} \rightarrow \gamma 6\pi$

¹ ABLIKIM 11K reports $(0.95 \pm 0.03 \pm 0.11) \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow \omega\omega)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.62 \pm 0.31) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

² ABLIKIM 05N reports $[\Gamma(\chi_{c0}(1P) \rightarrow \omega\omega)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))] = (0.212 \pm 0.053 \pm 0.037) \times 10^{-3}$ which we divide by our best value $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

 $\Gamma(\omega\phi)/\Gamma_{\text{total}}$ Γ_{38}/Γ

<u>VALUE (units 10^{-4})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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1.16±0.21±0.03 $\psi(2S) \rightarrow \gamma$ hadrons

¹ ABLIKIM 11K reports $(1.2 \pm 0.1 \pm 0.2) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow \omega\phi)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.62 \pm 0.31) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

 $\Gamma(K^+K^-)/\Gamma_{\text{total}}$ Γ_{39}/Γ

<u>VALUE (units 10^{-3})</u>	<u>DOCUMENT ID</u>
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5.91±0.32 OUR FIT $\Gamma(K_S^0 K_S^0)/\Gamma_{\text{total}}$ Γ_{40}/Γ

<u>VALUE (units 10^{-3})</u>	<u>DOCUMENT ID</u>
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3.10±0.18 OUR FIT $\Gamma(K_S^0 K_S^0)/\Gamma(\pi\pi)$ Γ_{40}/Γ_{31}

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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0.372±0.023 OUR FIT

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

0.31 ±0.05 ±0.05	^{1,2} CHEN	07B BELL	$e^+e^- \rightarrow e^+e^-\chi_{c0}$
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¹ Using $\Gamma(\pi\pi) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ from the $\pi^+\pi^-$ measurement of NAKAZAWA 05 rescaled by 3/2 to convert to $\pi\pi$.

² Not independent from other measurements.

 $\Gamma(K_S^0 K_S^0)/\Gamma(K^+K^-)$ Γ_{40}/Γ_{39}

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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0.52±0.04 OUR FIT

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

0.49±0.07±0.08	^{1,2} CHEN	07B BELL	$e^+e^- \rightarrow e^+e^-\chi_{c0}$
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¹ Using $\Gamma(K^+K^-) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ from NAKAZAWA 05.

² Not independent from other measurements.

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

<u>VALUE (units 10^{-3})</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<0.19	90	¹ ATHAR 07	CLEO	$\psi(2S) \rightarrow \gamma h^+ h^- h^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<1.0	90	² ABLIKIM 06R	BES2	$\psi(2S) \rightarrow \gamma \chi_{c0}$
¹ ATHAR 07 reports $< 0.21 \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow \pi^+\pi^-\eta)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = 9.99 \times 10^{-2}$.				
² ABLIKIM 06R reports $< 1.1 \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow \pi^+\pi^-\eta)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.2 \pm 0.4) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = 9.99 \times 10^{-2}$.				

$\Gamma(\pi^+\pi^-\eta')/\Gamma_{\text{total}}$ Γ_{42}/Γ

<u>VALUE (units 10^{-3})</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<0.35	90	¹ ATHAR 07	CLEO	$\psi(2S) \rightarrow \gamma h^+ h^- h^0$
¹ ATHAR 07 reports $< 0.38 \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow \pi^+\pi^-\eta')/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = 9.99 \times 10^{-2}$.				

$\Gamma(\bar{K}^0 K^+ \pi^- + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{43}/Γ

<u>VALUE (units 10^{-3})</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<0.09	90	¹ ATHAR 07	CLEO	$\psi(2S) \rightarrow \gamma h^+ h^- h^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<0.6	90	^{2,3} ABLIKIM 06R	BES2	$\psi(2S) \rightarrow \gamma \chi_{c0}$
<0.7	90	^{3,4} BAI 99B	BES	$\psi(2S) \rightarrow \gamma \chi_{c0}$
¹ ATHAR 07 reports $< 0.10 \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow \bar{K}^0 K^+ \pi^- + \text{c.c.})/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = 9.99 \times 10^{-2}$.				
² ABLIKIM 06R reports $< 0.70 \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow \bar{K}^0 K^+ \pi^- + \text{c.c.})/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.2 \pm 0.4) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = 9.99 \times 10^{-2}$.				
³ We have multiplied the $K_S^0 K^+ \pi^-$ measurement by a factor of 2 to convert to $K^0 K^+ \pi^-$.				
⁴ Rescaled by us using $B(\psi(2S) \rightarrow \gamma \chi_{c0}) = (9.4 \pm 0.4)\%$ and $B(\psi(2S) \rightarrow J/\psi(1S) \pi^+ \pi^-) = (32.6 \pm 0.5)\%$.				

$\Gamma(K^+ K^- \pi^0)/\Gamma_{\text{total}}$ Γ_{44}/Γ

<u>VALUE (units 10^{-3})</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<0.06	90	¹ ATHAR 07	CLEO	$\psi(2S) \rightarrow \gamma h^+ h^- h^0$
¹ ATHAR 07 reports $< 0.06 \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow K^+ K^- \pi^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = 9.99 \times 10^{-2}$.				

$\Gamma(K^+ K^- \eta)/\Gamma_{\text{total}}$ Γ_{45}/Γ

<u>VALUE (units 10^{-3})</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<0.22	90	¹ ATHAR	07	CLEO $\psi(2S) \rightarrow \gamma h^+ h^- h^0$

¹ ATHAR 07 reports $< 0.24 \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow K^+ K^- \eta)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = 9.99 \times 10^{-2}$.

$\Gamma(K^+ K^- K_S^0 K_S^0)/\Gamma_{\text{total}}$ Γ_{46}/Γ

<u>VALUE (units 10^{-3})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
1.38 ± 0.46 ± 0.04	16.8 ± 4.8	¹ ABLIKIM	050	BES2 $\psi(2S) \rightarrow \gamma \chi_{c0}$

¹ ABLIKIM 050 reports $[\Gamma(\chi_{c0}(1P) \rightarrow K^+ K^- K_S^0 K_S^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))]$ = $(0.138 \pm 0.039 \pm 0.025) \times 10^{-3}$ which we divide by our best value $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(K^+ K^- K^+ K^-)/\Gamma_{\text{total}}$ Γ_{47}/Γ

<u>VALUE (units 10^{-3})</u>	<u>DOCUMENT ID</u>
2.75 ± 0.28 OUR FIT	

$\Gamma(K^+ K^- \phi)/\Gamma_{\text{total}}$ Γ_{48}/Γ

<u>VALUE (units 10^{-3})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.95 ± 0.24 ± 0.03	38	¹ ABLIKIM	06T	BES2 $\psi(2S) \rightarrow \gamma 2K^+ 2K^-$

¹ ABLIKIM 06T reports $(1.03 \pm 0.22 \pm 0.15) \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow K^+ K^- \phi)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.2 \pm 0.4) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\phi\phi)/\Gamma_{\text{total}}$ Γ_{49}/Γ

<u>VALUE (units 10^{-3})</u>	<u>DOCUMENT ID</u>
0.77 ± 0.07 OUR FIT	

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

<u>VALUE (units 10^{-4})</u>	<u>DOCUMENT ID</u>
2.25 ± 0.09 OUR FIT	

$\Gamma(p\bar{p}\pi^0)/\Gamma_{\text{total}}$ Γ_{51}/Γ

<u>VALUE (units 10^{-3})</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.68 ± 0.07 OUR AVERAGE	Error includes scale factor of 1.3.		
0.72 ± 0.06 ± 0.02	¹ ONYISI	10	CLE3 $\psi(2S) \rightarrow \gamma p\bar{p}X$
0.54 ± 0.11 ± 0.01	² ATHAR	07	CLEO $\psi(2S) \rightarrow \gamma h^+ h^- h^0$

¹ ONYISI 10 reports $(7.76 \pm 0.37 \pm 0.51 \pm 0.39) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow p\bar{p}\pi^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

² ATHAR 07 reports $(0.59 \pm 0.10 \pm 0.08) \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow p\bar{p}\pi^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(p\bar{p}\eta)/\Gamma_{\text{total}}$ Γ_{52}/Γ

<u>VALUE (units 10^{-3})</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.35±0.04 OUR AVERAGE			
0.34±0.04±0.01	¹ ONYISI	10	CLE3 $\psi(2S) \rightarrow \gamma p\bar{p}X$
0.36±0.11±0.01	² ATHAR	07	CLEO $\psi(2S) \rightarrow \gamma h^+ h^- h^0$

¹ ONYISI 10 reports $(3.73 \pm 0.38 \pm 0.28 \pm 0.19) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow p\bar{p}\eta)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

² ATHAR 07 reports $(0.39 \pm 0.11 \pm 0.04) \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow p\bar{p}\eta)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

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

<u>VALUE (units 10^{-3})</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.51±0.05±0.01	¹ ONYISI	10	CLE3 $\psi(2S) \rightarrow \gamma p\bar{p}X$

¹ ONYISI 10 reports $(5.57 \pm 0.48 \pm 0.42 \pm 0.14) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow p\bar{p}\omega)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(p\bar{p}\phi)/\Gamma_{\text{total}}$ Γ_{54}/Γ

<u>VALUE (units 10^{-5})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
5.9±1.4±0.2	42 ± 8	¹ ABLIKIM	11F	BES3 $\psi(2S) \rightarrow \gamma p\bar{p}K^+ K^-$

¹ ABLIKIM 11F reports $(6.12 \pm 1.18 \pm 0.86) \times 10^{-5}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow p\bar{p}\phi)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.62 \pm 0.31) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\rho\bar{\rho}\pi^+\pi^-)/\Gamma_{\text{total}}$ Γ_{55}/Γ

VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
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2.1 ± 0.7 OUR EVALUATION Error includes scale factor of 1.4. Treating systematic error as correlated.

2.1 ± 1.0 OUR AVERAGE Error includes scale factor of 2.0.

1.57 ± 0.21 ± 0.53	¹ BAI	99B	BES $\psi(2S) \rightarrow \gamma\chi_{c0}$
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4.20 ± 1.15 ± 0.18	¹ TANENBAUM	78	MRK1 $\psi(2S) \rightarrow \gamma\chi_{c0}$
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¹ Rescaled by us using $B(\psi(2S) \rightarrow \gamma\chi_{c0}) = (9.4 \pm 0.4)\%$ and $B(\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-) = (32.6 \pm 0.5)\%$.

$\Gamma(\rho\bar{\rho}\pi^0\pi^0)/\Gamma_{\text{total}}$ Γ_{56}/Γ

VALUE (%)	EVTS	DOCUMENT ID	TECN	COMMENT
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0.102 ± 0.027 ± 0.003	39.5	¹ HE	08B	CLEO $e^+e^- \rightarrow \gamma h^+ h^- h^0 h^0$
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¹ HE 08B reports $0.11 \pm 0.02 \pm 0.02 \pm 0.01\%$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow \rho\bar{\rho}\pi^0\pi^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\rho\bar{\rho}K^+K^- \text{ (non-resonant)})/\Gamma_{\text{total}}$ Γ_{57}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
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1.19 ± 0.26 ± 0.03	48 ± 8	¹ ABLIKIM	11F	BES3 $\psi(2S) \rightarrow \gamma\rho\bar{\rho}K^+K^-$
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¹ ABLIKIM 11F reports $(1.24 \pm 0.20 \pm 0.18) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow \rho\bar{\rho}K^+K^- \text{ (non-resonant)})/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.62 \pm 0.31) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\rho\bar{\rho}K_S^0K_S^0)/\Gamma_{\text{total}}$ Γ_{58}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID	TECN	COMMENT
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<8.8	90	¹ ABLIKIM	06D	BES2 $\psi(2S) \rightarrow \chi_{c0}\gamma$
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¹ Using $B(\psi(2S) \rightarrow \chi_{c0}\gamma) = (9.2 \pm 0.5)\%$

$\Gamma(\rho\bar{\eta}\pi^-)/\Gamma_{\text{total}}$ Γ_{59}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
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12.4 ± 1.1 OUR AVERAGE

12.6 ± 1.1 ± 0.3	5150	¹ ABLIKIM	12J	BES3 $\psi(2S) \rightarrow \gamma\rho\bar{\eta}\pi^-$
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11.0 ± 3.0 ± 0.3		² ABLIKIM	06i	BES2 $\psi(2S) \rightarrow \gamma\rho\pi^-X$
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¹ ABLIKIM 12J reports $[\Gamma(\chi_{c0}(1P) \rightarrow \rho\bar{\eta}\pi^-)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))]$ = $(1.26 \pm 0.02 \pm 0.11) \times 10^{-4}$ which we divide by our best value $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

² ABLIKIM 06i reports $[\Gamma(\chi_{c0}(1P) \rightarrow \rho\bar{\eta}\pi^-)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))]$ = $(1.10 \pm 0.24 \pm 0.18) \times 10^{-4}$ which we divide by our best value $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\bar{p}n\pi^+)/\Gamma_{\text{total}}$ Γ_{60}/Γ

<u>VALUE (units 10^{-4})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
13.4±1.1±0.4	5808	¹ ABLIKIM	12J BES3	$\psi(2S) \rightarrow \gamma\bar{p}n\pi^+$

¹ ABLIKIM 12J reports $[\Gamma(\chi_{c0}(1P) \rightarrow \bar{p}n\pi^+)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))] = (1.34 \pm 0.03 \pm 0.11) \times 10^{-4}$ which we divide by our best value $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

 $\Gamma(\rho\bar{n}\pi^-\pi^0)/\Gamma_{\text{total}}$ Γ_{61}/Γ

<u>VALUE (units 10^{-4})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
22.9±2.0±0.6	2480	¹ ABLIKIM	12J BES3	$\psi(2S) \rightarrow \gamma\rho\bar{n}\pi^-\pi^0$

¹ ABLIKIM 12J reports $[\Gamma(\chi_{c0}(1P) \rightarrow \rho\bar{n}\pi^-\pi^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))] = (2.29 \pm 0.08 \pm 0.18) \times 10^{-4}$ which we divide by our best value $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

 $\Gamma(\bar{p}n\pi^+\pi^0)/\Gamma_{\text{total}}$ Γ_{62}/Γ

<u>VALUE (units 10^{-4})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
21.6±1.7±0.6	2757	¹ ABLIKIM	12J BES3	$\psi(2S) \rightarrow \gamma\bar{p}n\pi^+\pi^0$

¹ ABLIKIM 12J reports $[\Gamma(\chi_{c0}(1P) \rightarrow \bar{p}n\pi^+\pi^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))] = (2.16 \pm 0.07 \pm 0.16) \times 10^{-4}$ which we divide by our best value $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

 $\Gamma(\Lambda\bar{\Lambda})/\Gamma_{\text{total}}$ Γ_{63}/Γ

<u>VALUE (units 10^{-4})</u>	<u>DOCUMENT ID</u>
3.21±0.25 OUR FIT	

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

<u>VALUE (units 10^{-5})</u>	<u>CL%</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
115±12±3		426	¹ ABLIKIM	12I BES3	$\psi(2S) \rightarrow \gamma\Lambda\bar{\Lambda}\pi^+\pi^-$

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

<400 90 ² ABLIKIM 06D BES2 $\psi(2S) \rightarrow \chi_{c0}\gamma$

¹ ABLIKIM 12I reports $(119.0 \pm 6.4 \pm 11.4) \times 10^{-5}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow \Lambda\bar{\Lambda}\pi^+\pi^-)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.68 \pm 0.31) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

² Using $B(\psi(2S) \rightarrow \chi_{c0}\gamma) = (9.2 \pm 0.5)\%$

 $\Gamma(\Lambda\bar{\Lambda}\pi^+\pi^- \text{ (non-resonant)})/\Gamma_{\text{total}}$ Γ_{65}/Γ

<u>VALUE (units 10^{-5})</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<50	90	¹ ABLIKIM	12I BES3	$\psi(2S) \rightarrow \gamma\Lambda\bar{\Lambda}\pi^+\pi^-$

¹ ABLIKIM 12I reports $< 54 \times 10^{-5}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow \Lambda\bar{\Lambda}\pi^+\pi^- \text{ (non-resonant)})/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.68 \pm 0.31) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = 9.99 \times 10^{-2}$.

$\Gamma(\Sigma(1385)^+\bar{\Lambda}\pi^- + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{66}/Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID	TECN	COMMENT
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<50	90	¹ ABLIKIM	12I	BES3 $\psi(2S) \rightarrow \gamma \Sigma(1385)^+\bar{\Lambda}\pi^-$
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¹ ABLIKIM 12I reports $< 55 \times 10^{-5}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow \Sigma(1385)^+\bar{\Lambda}\pi^- + \text{c.c.})/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.68 \pm 0.31) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = 9.99 \times 10^{-2}$.

$\Gamma(\Sigma(1385)^-\bar{\Lambda}\pi^+ + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{67}/Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID	TECN	COMMENT
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<50	90	¹ ABLIKIM	12I	BES3 $\psi(2S) \rightarrow \gamma \Sigma(1385)^-\bar{\Lambda}\pi^+$
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¹ ABLIKIM 12I reports $< 50 \times 10^{-5}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow \Sigma(1385)^-\bar{\Lambda}\pi^+ + \text{c.c.})/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.68 \pm 0.31) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = 9.99 \times 10^{-2}$.

$\Gamma(K^+\bar{p}\Lambda + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{68}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
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1.22±0.12 OUR AVERAGE Error includes scale factor of 1.3.

1.28±0.09±0.03	9k	^{1,2} ABLIKIM	13D	BES3 $\psi(2S) \rightarrow \gamma \Lambda\bar{p}K^+$
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0.99±0.19±0.03		³ ATHAR	07	CLEO $\psi(2S) \rightarrow \gamma h^+ h^- h^0$
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¹ ABLIKIM 13D reports $(1.32 \pm 0.03 \pm 0.10) \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow K^+\bar{p}\Lambda + \text{c.c.})/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.68 \pm 0.31) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

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

³ ATHAR 07 reports $(1.07 \pm 0.17 \pm 0.12) \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow K^+\bar{p}\Lambda + \text{c.c.})/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(K^+\bar{p}\Lambda(1520) + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{69}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
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2.9±0.7±0.1	62 ± 12	¹ ABLIKIM	11F	BES3 $\psi(2S) \rightarrow \gamma p\bar{p}K^+K^-$
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¹ ABLIKIM 11F reports $(3.00 \pm 0.58 \pm 0.50) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow K^+\bar{p}\Lambda(1520) + \text{c.c.})/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.62 \pm 0.31) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\Lambda(1520)\bar{\Lambda}(1520))/\Gamma_{\text{total}}$ Γ_{70}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
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$3.1 \pm 1.2 \pm 0.1$	28 ± 10	¹ ABLIKIM	11F BES3	$\psi(2S) \rightarrow \gamma p \bar{p} K^+ K^-$
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¹ ABLIKIM 11F reports $(3.18 \pm 1.11 \pm 0.53) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow \Lambda(1520)\bar{\Lambda}(1520))/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.62 \pm 0.31) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

 $\Gamma(\Sigma^0\bar{\Sigma}^0)/\Gamma_{\text{total}}$ Γ_{71}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
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4.4 ± 0.4 OUR AVERAGE				
$4.6 \pm 0.5 \pm 0.1$	243	¹ ABLIKIM	13H BES3	$\psi(2S) \rightarrow \gamma \Sigma^0 \bar{\Sigma}^0$
$4.1 \pm 0.6 \pm 0.1$	78 ± 10	² NAIK	08 CLEO	$\psi(2S) \rightarrow \gamma \Sigma^0 \bar{\Sigma}^0$

¹ ABLIKIM 13H reports $(4.78 \pm 0.34 \pm 0.39) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow \Sigma^0 \bar{\Sigma}^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.62 \pm 0.31) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

² NAIK 08 reports $(4.41 \pm 0.56 \pm 0.47) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow \Sigma^0 \bar{\Sigma}^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

 $\Gamma(\Sigma^+\bar{\Sigma}^-)/\Gamma_{\text{total}}$ Γ_{72}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
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3.9 ± 0.7 OUR AVERAGE	Error includes scale factor of 1.7.			
$4.4 \pm 0.5 \pm 0.1$	148	¹ ABLIKIM	13H BES3	$\psi(2S) \rightarrow \gamma \Sigma^+ \bar{\Sigma}^-$
$3.0 \pm 0.6 \pm 0.1$	39 ± 7	² NAIK	08 CLEO	$\psi(2S) \rightarrow \gamma \Sigma^+ \bar{\Sigma}^-$

¹ ABLIKIM 13H reports $(4.54 \pm 0.42 \pm 0.30) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow \Sigma^+ \bar{\Sigma}^-)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.62 \pm 0.31) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

² NAIK 08 reports $(3.25 \pm 0.57 \pm 0.43) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow \Sigma^+ \bar{\Sigma}^-)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

 $\Gamma(\Sigma(1385)^+\bar{\Sigma}(1385)^-)/\Gamma_{\text{total}}$ Γ_{73}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT
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$15.9 \pm 5.7 \pm 0.4$	27	¹ ABLIKIM	12i BES3	$\psi(2S) \rightarrow \gamma \Lambda \bar{\Lambda} \pi^+ \pi^-$
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¹ ABLIKIM 12i reports $(16.4 \pm 5.7 \pm 1.6) \times 10^{-5}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow \Sigma(1385)^+ \bar{\Sigma}(1385)^-)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.68 \pm 0.31) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\Sigma(1385)^- \bar{\Sigma}(1385)^+)/\Gamma_{\text{total}}$ Γ_{74}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT
23±6±1	33	¹ ABLIKIM 12I	BES3	$\psi(2S) \rightarrow \gamma \Lambda \bar{\Lambda} \pi^+ \pi^-$

¹ ABLIKIM 12I reports $(23.5 \pm 6.2 \pm 2.3) \times 10^{-5}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow \Sigma(1385)^- \bar{\Sigma}(1385)^+)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.68 \pm 0.31) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\Xi^0 \Xi^0)/\Gamma_{\text{total}}$ Γ_{75}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
3.1±0.8±0.1	23.3 ± 4.9	¹ NAIK 08	CLEO	$\psi(2S) \rightarrow \gamma \Xi^0 \Xi^0$

¹ NAIK 08 reports $(3.34 \pm 0.70 \pm 0.48) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow \Xi^0 \Xi^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\Xi^- \Xi^+)/\Gamma_{\text{total}}$ Γ_{76}/Γ

VALUE (units 10^{-4})	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
4.7±0.7±0.1	95 ± 11		¹ NAIK 08	CLEO	$\psi(2S) \rightarrow \gamma \Xi^+ \Xi^-$

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

<10.3	90	² ABLIKIM 06D	BES2	$\psi(2S) \rightarrow \chi_{c0} \gamma$
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¹ NAIK 08 reports $(5.14 \pm 0.60 \pm 0.47) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow \Xi^- \Xi^+)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.99 \pm 0.27) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

² Using $B(\psi(2S) \rightarrow \chi_{c0} \gamma) = (9.2 \pm 0.5)\%$

$\Gamma(p\bar{p})/\Gamma_{\text{total}} \times \Gamma(\pi\pi)/\Gamma_{\text{total}}$ $\Gamma_{50}/\Gamma \times \Gamma_{31}/\Gamma$

VALUE (units 10^{-7})	DOCUMENT ID	TECN	COMMENT
18.8±1.2 OUR FIT			
15.3±2.4±0.8	¹ ANDREOTTI 03	E835	$\bar{p}p \rightarrow \chi_{c0} \rightarrow \pi^0 \pi^0$

¹ We have multiplied $B(p\bar{p}) \cdot B(\pi^0 \pi^0)$ measurement by 3 to obtain $B(p\bar{p}) \cdot B(\pi\pi)$.

$\Gamma(p\bar{p})/\Gamma_{\text{total}} \times \Gamma(\pi^0 \eta)/\Gamma_{\text{total}}$ $\Gamma_{50}/\Gamma \times \Gamma_{32}/\Gamma$

VALUE (units 10^{-7})	DOCUMENT ID	TECN	COMMENT
<0.4	ANDREOTTI 05C	E835	$\bar{p}p \rightarrow \pi^0 \eta$

$\Gamma(p\bar{p})/\Gamma_{\text{total}} \times \Gamma(\pi^0 \eta')/\Gamma_{\text{total}}$ $\Gamma_{50}/\Gamma \times \Gamma_{33}/\Gamma$

VALUE (units 10^{-7})	DOCUMENT ID	TECN	COMMENT
<2.5	ANDREOTTI 05C	E835	$\bar{p}p \rightarrow \pi^0 \eta$

$\Gamma(\rho\bar{\rho})/\Gamma_{\text{total}} \times \Gamma(\eta\eta)/\Gamma_{\text{total}}$				$\Gamma_{50}/\Gamma \times \Gamma_{34}/\Gamma$
VALUE (units 10^{-7})	DOCUMENT ID	TECN	COMMENT	
6.6 ± 0.5 OUR FIT				
$4.0 \pm 1.2^{+0.5}_{-0.3}$	ANDREOTTI	05C E835	$\bar{p}p \rightarrow \eta\eta$	

$\Gamma(\rho\bar{\rho})/\Gamma_{\text{total}} \times \Gamma(\eta\eta')/\Gamma_{\text{total}}$				$\Gamma_{50}/\Gamma \times \Gamma_{35}/\Gamma$
VALUE (units 10^{-6})	DOCUMENT ID	TECN	COMMENT	
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$2.1^{+2.3}_{-1.5}$	ANDREOTTI	05C E835	$\bar{p}p \rightarrow \pi^0\eta$	

————— **RADIATIVE DECAYS** —————

$\Gamma(\gamma J/\psi(1S))/\Gamma_{\text{total}}$				Γ_{77}/Γ
VALUE (units 10^{-4})	DOCUMENT ID	TECN	COMMENT	
127 ± 6 OUR FIT				
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$200 \pm 20 \pm 20$	¹ ADAM	05A CLEO	$e^+e^- \rightarrow \psi(2S) \rightarrow \gamma\chi_{c0}$	
¹ Uses $B(\psi(2S) \rightarrow \gamma\chi_{c0} \rightarrow \gamma\gamma J/\psi)$ from ADAM 05A and $B(\psi(2S) \rightarrow \gamma\chi_{c0})$ from ATHAR 04.				

$\Gamma(\gamma\rho^0)/\Gamma_{\text{total}}$				Γ_{78}/Γ	
VALUE (units 10^{-6})	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
< 9	90	1.2 ± 4.5	¹ BENNETT	08A CLEO	$\psi(2S) \rightarrow \gamma\gamma\rho^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
< 10	90	6 ± 12	² ABLIKIM	11E BES3	$\psi(2S) \rightarrow \gamma\gamma\rho^0$
¹ BENNETT 08A reports $< 9.6 \times 10^{-6}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow \gamma\rho^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.2 \pm 0.4) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = 9.99 \times 10^{-2}$.					
² ABLIKIM 11E reports $< 10.5 \times 10^{-6}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow \gamma\rho^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.62 \pm 0.31) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = 9.99 \times 10^{-2}$.					

$\Gamma(\gamma\omega)/\Gamma_{\text{total}}$				Γ_{79}/Γ	
VALUE (units 10^{-6})	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
< 8	90	0.0 ± 2.8	¹ BENNETT	08A CLEO	$\psi(2S) \rightarrow \gamma\gamma\omega$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
< 12	90	5 ± 11	² ABLIKIM	11E BES3	$\psi(2S) \rightarrow \gamma\gamma\omega$
¹ BENNETT 08A reports $< 8.8 \times 10^{-6}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow \gamma\omega)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.2 \pm 0.4) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = 9.99 \times 10^{-2}$.					
² ABLIKIM 11E reports $< 12.9 \times 10^{-6}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow \gamma\omega)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.62 \pm 0.31) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = 9.99 \times 10^{-2}$.					

$\Gamma(\gamma\phi)/\Gamma_{\text{total}}$ Γ_{80}/Γ

VALUE (units 10^{-6})	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
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< 6	90	0.1 ± 1.6	¹ BENNETT	08A CLEO	$\psi(2S) \rightarrow \gamma\gamma\phi$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

<16	90	15 ± 7	² ABLIKIM	11E BES3	$\psi(2S) \rightarrow \gamma\gamma\phi$
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¹ BENNETT 08A reports $< 6.4 \times 10^{-6}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow \gamma\phi)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.2 \pm 0.4) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = 9.99 \times 10^{-2}$.

² ABLIKIM 11E reports $< 16.2 \times 10^{-6}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow \gamma\phi)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.62 \pm 0.31) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = 9.99 \times 10^{-2}$.

$\Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ Γ_{81}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID	TECN	COMMENT
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2.23 ± 0.13 OUR FIT

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

<7	90	¹ WICHT	08 BELL	$B^\pm \rightarrow K^\pm \gamma\gamma$
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¹ WICHT 08 reports $[\Gamma(\chi_{c0}(1P) \rightarrow \gamma\gamma)/\Gamma_{\text{total}}] \times [B(B^+ \rightarrow \chi_{c0}(1P) K^+)] < 0.11 \times 10^{-6}$ which we divide by our best value $B(B^+ \rightarrow \chi_{c0}(1P) K^+) = 1.50 \times 10^{-4}$.

$\Gamma(\gamma\gamma)/\Gamma(\gamma J/\psi(1S))$ Γ_{81}/Γ_{77}

VALUE (units 10^{-2})	DOCUMENT ID	TECN	COMMENT
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1.76 ± 0.13 OUR FIT

2.0 ± 0.4 OUR AVERAGE

$2.2 \pm 0.4 \begin{smallmatrix} +0.1 \\ -0.2 \end{smallmatrix}$	¹ ANDREOTTI	04 E835	$p\bar{p} \rightarrow \chi_{c0} \rightarrow \gamma\gamma$
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1.45 ± 0.74	² AMBROGIANI	00B E835	$\bar{p}p \rightarrow \chi_{c2} \rightarrow \gamma\gamma, \gamma J/\psi$
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¹ The values of $B(p\bar{p})B(\gamma\gamma)$ and $B(\gamma\gamma)B(\gamma J/\psi)$ measured by ANDREOTTI 04 are not independent. The latter is used in the fit because of smaller systematics.

² Calculated by us using $B(J/\psi(1S) \rightarrow e^+ e^-) = 0.0593 \pm 0.0010$.

$\Gamma(p\bar{p})/\Gamma_{\text{total}} \times \Gamma(\gamma J/\psi(1S))/\Gamma_{\text{total}}$ $\Gamma_{50}/\Gamma \times \Gamma_{77}/\Gamma$

VALUE (units 10^{-7})	EVTS	DOCUMENT ID	TECN	COMMENT
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28.5 ± 1.6 OUR FIT

28.2 ± 2.1 OUR AVERAGE

$28.0 \pm 1.9 \pm 1.3$	392	^{1,2,3} BAGNASCO	02 E835	$\bar{p}p \rightarrow \chi_{c0} \rightarrow J/\psi\gamma$
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$29.3 \begin{smallmatrix} +5.7 \\ -4.7 \end{smallmatrix} \pm 1.5$	89	^{1,2} AMBROGIANI	99B	$\bar{p}p \rightarrow \chi_{c0} \rightarrow J/\psi\gamma$
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¹ Values in $(\Gamma(p\bar{p}) \times \Gamma(\gamma J/\psi(1S))/\Gamma_{\text{total}})$ and $(\Gamma(p\bar{p})/\Gamma_{\text{total}} \times \Gamma(\gamma J/\psi(1S))/\Gamma_{\text{total}})$ are not independent. The latter is used in the fit since it is less correlated to the total width.

² Calculated by us using $B(J/\psi(1S) \rightarrow e^+ e^-) = 0.0593 \pm 0.0010$.

³ Recalculated by ANDREOTTI 05A.

$$\frac{\Gamma(p\bar{p})/\Gamma_{\text{total}} \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}}{\text{VALUE (units } 10^{-8}\text{)}} \quad \frac{\Gamma_{50}/\Gamma \times \Gamma_{81}/\Gamma}{\text{DOCUMENT ID} \quad \text{TECN} \quad \text{COMMENT}}$$

5.0 ± 0.4 OUR FIT

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

$$6.52 \pm 1.18^{+0.48}_{-0.72} \quad {}^1 \text{ ANDREOTTI 04 E835 } p\bar{p} \rightarrow \chi_{c0} \rightarrow \gamma\gamma$$

¹ The values of $B(p\bar{p})B(\gamma\gamma)$ and $B(\gamma\gamma)B(\gamma J/\psi)$ measured by ANDREOTTI 04 are not independent. The latter is used in the fit because of smaller systematics.

$\chi_{c0}(1P)$ CROSS-PARTICLE BRANCHING RATIOS

$$\frac{\Gamma(\chi_{c0}(1P) \rightarrow p\bar{p})/\Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))/\Gamma_{\text{total}}}{\text{VALUE (units } 10^{-6}\text{)}} \quad \frac{\Gamma_{50}/\Gamma \times \Gamma_{128}^{\psi(2S)}/\Gamma_{11}^{\psi(2S)}}{\text{DOCUMENT ID} \quad \text{TECN} \quad \text{COMMENT}}$$

22.5 ± 0.9 OUR FIT

23.7 ± 1.0 OUR AVERAGE

VALUE (units 10^{-6})	EVTS	DOCUMENT ID	TECN	COMMENT
$23.7 \pm 0.8 \pm 0.9$	1222	ABLIKIM	13v BES3	$\psi(2S) \rightarrow \gamma p\bar{p}$
$23.7 \pm 1.4 \pm 1.4$	383 ± 22	¹ NAIK	08 CLEO	$\psi(2S) \rightarrow \gamma p\bar{p}$
$23.6^{+3.7}_{-3.4} \pm 3.4$	89.5^{+14}_{-13}	BAI	04F BES	$\psi(2S) \rightarrow \gamma\chi_{c0}(1P) \rightarrow \gamma\bar{p}p$

¹ Calculated by us. NAIK 08 reports $B(\chi_{c0} \rightarrow p\bar{p}) = (25.7 \pm 1.5 \pm 1.5 \pm 1.3) \times 10^{-5}$ using $B(\psi(2S) \rightarrow \gamma\chi_{c0}) = (9.22 \pm 0.11 \pm 0.46)\%$.

$$\frac{\Gamma(\chi_{c0}(1P) \rightarrow p\bar{p})/\Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))/\Gamma(\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-)}{\text{VALUE (units } 10^{-5}\text{)}} \quad \frac{\Gamma_{50}/\Gamma \times \Gamma_{128}^{\psi(2S)}/\Gamma_{11}^{\psi(2S)}}{\text{DOCUMENT ID} \quad \text{TECN} \quad \text{COMMENT}}$$

6.53 ± 0.27 OUR FIT

4.6 ± 1.9 ¹ BAI 98I BES $\psi(2S) \rightarrow \gamma\chi_{c0} \rightarrow \gamma\bar{p}p$

¹ Calculated by us. The value for $B(\chi_{c0} \rightarrow p\bar{p})$ reported in BAI 98I is derived using $B(\psi(2S) \rightarrow \gamma\chi_{c0}) = (9.3 \pm 0.8)\%$ and $B(\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-) = (32.4 \pm 2.6)\%$ [BAI 98D].

$$\frac{\Gamma(\chi_{c0}(1P) \rightarrow \Lambda\bar{\Lambda})/\Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))/\Gamma_{\text{total}}}{\text{VALUE (units } 10^{-6}\text{)}} \quad \frac{\Gamma_{63}/\Gamma \times \Gamma_{128}^{\psi(2S)}/\Gamma_{11}^{\psi(2S)}}{\text{DOCUMENT ID} \quad \text{TECN} \quad \text{COMMENT}}$$

32.0 ± 2.3 OUR FIT

31.7 ± 2.3 OUR AVERAGE

VALUE (units 10^{-6})	EVTS	DOCUMENT ID	TECN	COMMENT
$32.0 \pm 1.9 \pm 2.2$	369	¹ ABLIKIM	13H BES3	$\psi(2S) \rightarrow \gamma\Lambda\bar{\Lambda}$
$31.2 \pm 3.3 \pm 2.0$	131 ± 12	² NAIK	08 CLEO	$\psi(2S) \rightarrow \gamma\Lambda\bar{\Lambda}$

¹ Calculated by us. ABLIKIM 13H reports $B(\chi_{c0} \rightarrow \Lambda\bar{\Lambda}) = (33.3 \pm 2.0 \pm 2.6) \times 10^{-5}$ from a measurement of $B(\chi_{c0} \rightarrow \Lambda\bar{\Lambda}) \times B(\psi(2S) \rightarrow \gamma\chi_{c0})$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c0}) = (9.62 \pm 0.31)\%$.

² Calculated by us. NAIK 08 reports $B(\chi_{c0} \rightarrow \Lambda\bar{\Lambda}) = (33.8 \pm 3.6 \pm 2.2 \pm 1.7) \times 10^{-5}$ using $B(\psi(2S) \rightarrow \gamma\chi_{c0}) = (9.22 \pm 0.11 \pm 0.46)\%$.

$$\frac{\Gamma(\chi_{c0}(1P) \rightarrow \Lambda\bar{\Lambda})/\Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))/\Gamma(\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-)}{\Gamma_{63}/\Gamma \times \Gamma_{128}^{\psi(2S)}/\Gamma_{11}^{\psi(2S)}}$$

VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT
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9.3±0.7 OUR FIT

$13.0^{+3.6}_{-3.5} \pm 2.5$	$15.2^{+4.2}_{-4.0}$	¹ BAI	03E BES	$\psi(2S) \rightarrow \gamma\Lambda\bar{\Lambda}$
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¹ BAI 03E reports [$B(\chi_{c0} \rightarrow \Lambda\bar{\Lambda}) B(\psi(2S) \rightarrow \gamma\chi_{c0}) / B(\psi(2S) \rightarrow J/\psi\pi^+\pi^-)] \times [B^2(\Lambda \rightarrow \pi^-p) / B(J/\psi \rightarrow p\bar{p})] = (2.45^{+0.68}_{-0.65} \pm 0.46)\%$. We calculate from this measurement the presented value using $B(\Lambda \rightarrow \pi^-p) = (63.9 \pm 0.5)\%$ and $B(J/\psi \rightarrow p\bar{p}) = (2.17 \pm 0.07) \times 10^{-3}$.

$$\frac{\Gamma(\chi_{c0}(1P) \rightarrow \gamma J/\psi(1S))/\Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))/\Gamma_{\text{total}}}{\Gamma_{77}/\Gamma \times \Gamma_{128}^{\psi(2S)}/\Gamma_{9}^{\psi(2S)}}$$

VALUE (units 10^{-2})	EVTS	DOCUMENT ID	TECN	COMMENT
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0.126±0.006 OUR FIT

0.131±0.035 OUR AVERAGE Error includes scale factor of 3.9.

$0.151 \pm 0.003 \pm 0.010$	4.3k	ABLIKIM	120 BES3	$\psi(2S) \rightarrow \gamma\chi_{c0}$
0.069 ± 0.018		¹ OREGLIA	82 CBAL	$\psi(2S) \rightarrow \gamma\chi_{c0}$
0.4 ± 0.3		² BRANDELIK	79B DASP	$\psi(2S) \rightarrow \gamma\chi_{c0}$
0.16 ± 0.11		² BARTEL	78B CNTR	$\psi(2S) \rightarrow \gamma\chi_{c0}$
3.3 ± 1.7		³ BIDDICK	77 CNTR	$e^+e^- \rightarrow \gamma X$

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

$0.125 \pm 0.007 \pm 0.013$	560	⁴ MENDEZ	08 CLEO	$\psi(2S) \rightarrow \gamma\chi_{c0}$
$0.18 \pm 0.01 \pm 0.02$	172	⁵ ADAM	05A CLEO	Repl. by MENDEZ 08

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

² Recalculated by us using $B(J/\psi(1S) \rightarrow \mu^+\mu^-) = 0.0588 \pm 0.0010$.

³ Assumes isotropic gamma distribution.

⁴ Not independent from other measurements of MENDEZ 08.

⁵ Not independent from other values reported by ADAM 05A.

$$\frac{\Gamma(\chi_{c0}(1P) \rightarrow \gamma J/\psi(1S))/\Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))/\Gamma(\psi(2S) \rightarrow J/\psi(1S)\text{anything})}{\Gamma_{77}/\Gamma \times \Gamma_{128}^{\psi(2S)}/\Gamma_{9}^{\psi(2S)}}$$

$$\Gamma_{77}/\Gamma \times \Gamma_{128}^{\psi(2S)}/\Gamma_{9}^{\psi(2S)} = \Gamma_{77}/\Gamma \times \Gamma_{128}^{\psi(2S)}/(\Gamma_{11}^{\psi(2S)} + \Gamma_{12}^{\psi(2S)} + \Gamma_{13}^{\psi(2S)} + 0.339\Gamma_{129}^{\psi(2S)} + 0.192\Gamma_{130}^{\psi(2S)})$$

VALUE (units 10^{-2})	EVTS	DOCUMENT ID	TECN	COMMENT
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0.208±0.011 OUR FIT

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

$0.201 \pm 0.011 \pm 0.021$	560	¹ MENDEZ	08 CLEO	$\psi(2S) \rightarrow \gamma\chi_{c0}$
$0.31 \pm 0.02 \pm 0.03$	172	ADAM	05A CLEO	Repl. by MENDEZ 08

¹ Not independent from other measurements of MENDEZ 08.

$$\frac{\Gamma(\chi_{c0}(1P) \rightarrow \gamma J/\psi(1S))}{\Gamma_{\text{total}}} \times \frac{\Gamma(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))}{\Gamma(\psi(2S) \rightarrow J/\psi(1S) \pi^+ \pi^-)} \times \frac{\Gamma_{77}/\Gamma \times \Gamma_{128}^{\psi(2S)}/\Gamma_{11}^{\psi(2S)}}{\Gamma_{128}^{\psi(2S)}/\Gamma_{11}^{\psi(2S)}}$$

VALUE (units 10^{-2})	EVTS	DOCUMENT ID	TECN	COMMENT
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0.367 ± 0.019 OUR FIT

0.358 ± 0.020 ± 0.037	560	MENDEZ	08	CLEO $\psi(2S) \rightarrow \gamma \chi_{c0}$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

0.55 ± 0.04 ± 0.06	172	¹ ADAM	05A	CLEO Repl. by MENDEZ 08
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¹ Not independent from other values reported by ADAM 05A.

$$\frac{\Gamma(\chi_{c0}(1P) \rightarrow \gamma \gamma)}{\Gamma_{\text{total}}} \times \frac{\Gamma(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))}{\Gamma_{\text{total}}} \times \frac{\Gamma_{81}/\Gamma \times \Gamma_{128}^{\psi(2S)}/\Gamma_{11}^{\psi(2S)}}{\Gamma_{128}^{\psi(2S)}/\Gamma_{11}^{\psi(2S)}}$$

VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT
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2.23 ± 0.14 OUR FIT

2.18 ± 0.18 OUR AVERAGE

2.17 ± 0.17 ± 0.12	0.8k	ABLIKIM	12A	BES3 $\psi(2S) \rightarrow \gamma \chi_{c0} \rightarrow 3\gamma$
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2.17 ± 0.32 ± 0.10	0.2k	ECKLUND	08A	CLEO $\psi(2S) \rightarrow \gamma \chi_{c0} \rightarrow 3\gamma$
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3.7 ± 1.8 ± 1.0		LEE	85	CBAL $\psi(2S) \rightarrow \gamma \chi_{c0}$
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$$\frac{\Gamma(\chi_{c0}(1P) \rightarrow \pi \pi)}{\Gamma_{\text{total}}} \times \frac{\Gamma(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))}{\Gamma_{\text{total}}} \times \frac{\Gamma_{31}/\Gamma \times \Gamma_{128}^{\psi(2S)}/\Gamma_{11}^{\psi(2S)}}{\Gamma_{128}^{\psi(2S)}/\Gamma_{11}^{\psi(2S)}}$$

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
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8.32 ± 0.29 OUR FIT

8.80 ± 0.34 OUR AVERAGE

9.11 ± 0.08 ± 0.65	17k	¹ ABLIKIM	10A	BES3 $e^+ e^- \rightarrow \psi(2S) \rightarrow \gamma \chi_{c0}$
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8.81 ± 0.11 ± 0.43	8.9k	² ASNER	09	CLEO $\psi(2S) \rightarrow \gamma \pi^+ \pi^-$
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8.13 ± 0.19 ± 0.89	2.8k	³ ASNER	09	CLEO $\psi(2S) \rightarrow \gamma \pi^0 \pi^0$
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¹ Calculated by us. ABLIKIM 10A reports $B(\chi_{c0} \rightarrow \pi^0 \pi^0) = (3.23 \pm 0.03 \pm 0.23 \pm 0.14) \times 10^{-3}$ using $B(\psi(2S) \rightarrow \gamma \chi_{c0}) = (9.4 \pm 0.4)\%$. We have multiplied the $\pi^0 \pi^0$ measurement by 3 to obtain $\pi \pi$.

² Calculated by us. ASNER 09 reports $B(\chi_{c0} \rightarrow \pi^+ \pi^-) = (6.37 \pm 0.08 \pm 0.31 \pm 0.32) \times 10^{-3}$ using $B(\psi(2S) \rightarrow \gamma \chi_{c0}) = (9.22 \pm 0.11 \pm 0.46)\%$. We have multiplied the $\pi^+ \pi^-$ measurement by 3/2 to obtain $\pi \pi$.

³ Calculated by us. ASNER 09 reports $B(\chi_{c0} \rightarrow \pi^0 \pi^0) = (2.94 \pm 0.07 \pm 0.32 \pm 0.15) \times 10^{-3}$ using $B(\psi(2S) \rightarrow \gamma \chi_{c0}) = (9.22 \pm 0.11 \pm 0.46)\%$. We have multiplied the $\pi^0 \pi^0$ measurement by 3 to obtain $\pi \pi$.

$$\frac{\Gamma(\chi_{c0}(1P) \rightarrow \pi \pi)}{\Gamma_{\text{total}}} \times \frac{\Gamma(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))}{\Gamma(\psi(2S) \rightarrow J/\psi(1S) \pi^+ \pi^-)} \times \frac{\Gamma_{31}/\Gamma \times \Gamma_{128}^{\psi(2S)}/\Gamma_{11}^{\psi(2S)}}{\Gamma_{128}^{\psi(2S)}/\Gamma_{11}^{\psi(2S)}}$$

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
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24.1 ± 0.8 OUR FIT

20.7 ± 1.7 OUR AVERAGE

23.9 ± 2.7 ± 4.1	97 ± 11	¹ BAI	03C	BES $\psi(2S) \rightarrow \gamma \chi_{c0} \rightarrow \gamma \pi^0 \pi^0$
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20.2 ± 1.1 ± 1.5	720 ± 32	² BAI	98I	BES $\psi(2S) \rightarrow \gamma \chi_{c0} \rightarrow \gamma \pi^+ \pi^-$
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¹ We have multiplied $\pi^0 \pi^0$ measurement by 3 to obtain $\pi \pi$.

² Calculated by us. The value for $B(\chi_{c0} \rightarrow \pi^+ \pi^-)$ reported in BAI 98I is derived using $B(\psi' \rightarrow \gamma \chi_{c0}) = (9.3 \pm 0.8)\%$ and $B(\psi' \rightarrow J/\psi \pi^+ \pi^-) = (32.4 \pm 2.6)\%$ [BAI 98D]. We have multiplied $\pi^+ \pi^-$ measurement by 3/2 to obtain $\pi \pi$.

$$\Gamma(\chi_{c0}(1P) \rightarrow \eta\eta) / \Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) / \Gamma_{\text{total}} \quad \Gamma_{34} / \Gamma \times \Gamma_{128}^{\psi(2S)} / \Gamma_{\psi(2S)}$$

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
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2.95 ± 0.18 OUR FIT

3.12 ± 0.19 OUR AVERAGE

3.23 ± 0.09 ± 0.23	2132	¹ ABLIKIM	10A	BES3 $e^+e^- \rightarrow \psi(2S) \rightarrow \gamma\chi_{c0}$
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2.93 ± 0.12 ± 0.29	0.9k	² ASNER	09	CLEO $\psi(2S) \rightarrow \gamma\eta\eta$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

2.86 ± 0.46 ± 0.37	48	³ ADAMS	07	CLEO $\psi(2S) \rightarrow \gamma\chi_{c0}$
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¹ Calculated by us. ABLIKIM 10A reports $B(\chi_{c0} \rightarrow \eta\eta) = (3.44 \pm 0.10 \pm 0.24 \pm 0.13) \times 10^{-3}$ using $B(\psi(2S) \rightarrow \gamma\chi_{c0}) = (9.4 \pm 0.4)\%$.

² Calculated by us. ASNER 09 reports $B(\chi_{c0} \rightarrow \eta\eta) = (3.18 \pm 0.13 \pm 0.31 \pm 0.16) \times 10^{-3}$ using $B(\psi(2S) \rightarrow \gamma\chi_{c0}) = (9.22 \pm 0.11 \pm 0.46)\%$.

³ Superseded by ASNER 09. Calculated by us. The value of $B(\chi_{c0}(1P) \rightarrow \eta\eta)$ reported by ADAMS 07 was derived using $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46)\%$ (ATHAR 04).

$$\Gamma(\chi_{c0}(1P) \rightarrow \eta\eta) / \Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) / \Gamma(\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-) \quad \Gamma_{34} / \Gamma \times \Gamma_{128}^{\psi(2S)} / \Gamma_{11}^{\psi(2S)}$$

VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
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0.85 ± 0.05 OUR FIT

0.578 ± 0.241 ± 0.158

BAI	03C	BES	$\psi(2S) \rightarrow \gamma\eta\eta$
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$$\Gamma(\chi_{c0}(1P) \rightarrow K^+K^-) / \Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) / \Gamma_{\text{total}} \quad \Gamma_{39} / \Gamma \times \Gamma_{128}^{\psi(2S)} / \Gamma_{\psi(2S)}$$

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
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5.90 ± 0.28 OUR FIT

5.97 ± 0.07 ± 0.32

8.1k	¹ ASNER	09	CLEO	$\psi(2S) \rightarrow \gamma K^+K^-$
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¹ Calculated by us. ASNER 09 reports $B(\chi_{c0} \rightarrow K^+K^-) = (6.47 \pm 0.08 \pm 0.35 \pm 0.32) \times 10^{-3}$ using $B(\psi(2S) \rightarrow \gamma\chi_{c0}) = (9.22 \pm 0.11 \pm 0.46)\%$.

$$\Gamma(\chi_{c0}(1P) \rightarrow K^+K^-) / \Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) / \Gamma(\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-) \quad \Gamma_{39} / \Gamma \times \Gamma_{128}^{\psi(2S)} / \Gamma_{11}^{\psi(2S)}$$

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
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1.71 ± 0.08 OUR FIT

1.63 ± 0.10 ± 0.15

774 ± 38	¹ BAI	98I	BES	$\psi(2S) \rightarrow \gamma K^+K^-$
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¹ Calculated by us. The value for $B(\chi_{c0} \rightarrow K^+K^-)$ reported by BAI 98I is derived using $B(\psi(2S) \rightarrow \gamma\chi_{c0}) = (9.3 \pm 0.8)\%$ and $B(\psi(2S) \rightarrow J/\psi\pi^+\pi^-) = (32.4 \pm 2.6)\%$ [BAI 98D].

$$\Gamma(\chi_{c0}(1P) \rightarrow K_S^0 K_S^0) / \Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) / \Gamma_{\text{total}} \quad \Gamma_{40} / \Gamma \times \Gamma_{128}^{\psi(2S)} / \Gamma_{\psi(2S)}$$

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
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3.09 ± 0.16 OUR FIT

3.18 ± 0.17 OUR AVERAGE

3.22 ± 0.07 ± 0.17	2.1k	¹ ASNER	09	CLEO $\psi(2S) \rightarrow \gamma K_S^0 K_S^0$
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3.02 ± 0.19 ± 0.33	322	ABLIKIM	05O	BES2 $\psi(2S) \rightarrow \gamma K_S^0 K_S^0$
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¹ Calculated by us. ASNER 09 reports $B(\chi_{c0} \rightarrow K_S^0 K_S^0) = (3.49 \pm 0.08 \pm 0.18 \pm 0.17) \times 10^{-3}$ using $B(\psi(2S) \rightarrow \gamma \chi_{c0}) = (9.22 \pm 0.11 \pm 0.46)\%$.

$$\frac{\Gamma(\chi_{c0}(1P) \rightarrow K_S^0 K_S^0) / \Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) / \Gamma(\psi(2S) \rightarrow J/\psi(1S) \pi^+ \pi^-)}{\Gamma_{40} / \Gamma \times \Gamma_{128}^{\psi(2S)} / \Gamma_{11}^{\psi(2S)}}$$

VALUE (units 10^{-4})	DOCUMENT ID	TECN	COMMENT
9.0 ± 0.5 OUR FIT			
5.6 ± 0.8 ± 1.3	¹ BAI	99B	BES $\psi(2S) \rightarrow \gamma K_S^0 K_S^0$

¹ Calculated by us. The value of $B(\chi_{c0} \rightarrow K_S^0 K_S^0)$ reported by BAI 99B was derived using $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.3 \pm 0.8)\%$ and $B(\psi(2S) \rightarrow J/\psi \pi^+ \pi^-) = (32.4 \pm 2.6)\%$ [BAI 98D].

$$\frac{\Gamma(\chi_{c0}(1P) \rightarrow 2(\pi^+ \pi^-)) / \Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) / \Gamma(\psi(2S) \rightarrow J/\psi(1S) \pi^+ \pi^-)}{\Gamma_1 / \Gamma \times \Gamma_{128}^{\psi(2S)} / \Gamma_{11}^{\psi(2S)}}$$

VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
6.5 ± 0.5 OUR FIT			
6.9 ± 2.4 OUR AVERAGE	Error includes scale factor of 3.8.		

4.4 ± 0.1 ± 0.9	¹ BAI	99B	BES $\psi(2S) \rightarrow \gamma \chi_{c0}$
9.3 ± 0.9	² TANENBAUM	78	MRK1 $\psi(2S) \rightarrow \gamma \chi_{c0}$

¹ Calculated by us. The value for $B(\chi_{c0} \rightarrow 2\pi^+ 2\pi^-)$ reported in BAI 99B is derived using $B(\psi(2S) \rightarrow \gamma \chi_{c0}) = (9.3 \pm 0.8)\%$ and $B(\psi(2S) \rightarrow J/\psi(1S) \pi^+ \pi^-) = (32.4 \pm 2.6)\%$ [BAI 98D].

² The value $B(\psi(1S) \rightarrow \gamma \chi_{c0}) \times B(\chi_{c0} \rightarrow 2\pi^+ 2\pi^-)$ reported in TANENBAUM 78 is derived using $B(\psi(2S) \rightarrow J/\psi(1S) \pi^+ \pi^-) \times B(J/\psi(1S) \rightarrow \ell^+ \ell^-) = (4.6 \pm 0.7)\%$. Calculated by us using $B(J/\psi(1S) \rightarrow \ell^+ \ell^-) = 0.1181 \pm 0.0020$.

$$\frac{\Gamma(\chi_{c0}(1P) \rightarrow \pi^+ \pi^- K^+ K^-) / \Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) / \Gamma_{\text{total}}}{\Gamma_8 / \Gamma \times \Gamma_{128}^{\psi(2S)} / \Gamma_{11}^{\psi(2S)}}$$

VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
1.75 ± 0.14 OUR FIT			
1.64 ± 0.05 ± 0.2	ABLIKIM	05Q	BES2 $\psi(2S) \rightarrow \gamma \chi_{c0}$

$$\frac{\Gamma(\chi_{c0}(1P) \rightarrow \pi^+ \pi^- K^+ K^-) / \Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) / \Gamma(\psi(2S) \rightarrow J/\psi(1S) \pi^+ \pi^-)}{\Gamma_8 / \Gamma \times \Gamma_{128}^{\psi(2S)} / \Gamma_{11}^{\psi(2S)}}$$

VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
5.1 ± 0.4 OUR FIT			
5.8 ± 1.6 OUR AVERAGE	Error includes scale factor of 2.3.		

4.22 ± 0.20 ± 0.97	BAI	99B	BES $\psi(2S) \rightarrow \gamma \chi_{c0}$
7.4 ± 1.0	¹ TANENBAUM	78	MRK1 $\psi(2S) \rightarrow \gamma \chi_{c0}$

¹ The reported value is derived using $B(\psi(2S) \rightarrow \pi^+ \pi^- J/\psi) \times B(J/\psi \rightarrow \ell^+ \ell^-) = (4.6 \pm 0.7)\%$. Calculated by us using $B(J/\psi \rightarrow \ell^+ \ell^-) = 0.1181 \pm 0.0020$.

$$\frac{\Gamma(\chi_{c0}(1P) \rightarrow K^+ K^- K^+ K^-) / \Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) / \Gamma_{\text{total}}}{\Gamma_{47} / \Gamma \times \Gamma_{128}^{\psi(2S)} / \Gamma_{\psi(2S)}}$$

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
2.74 ± 0.28 OUR FIT				
3.20 ± 0.11 ± 0.41	278	¹ ABLIKIM	06T BES2	$\psi(2S) \rightarrow \gamma 2K^+ 2K^-$

¹ Calculated by us. The value of $B(\chi_{c0} \rightarrow 2K^+ 2K^-)$ reported by ABLIKIM 06T was derived using $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.2 \pm 0.4)\%$.

$$\frac{\Gamma(\chi_{c0}(1P) \rightarrow K^+ K^- K^+ K^-) / \Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) / \Gamma_{\text{total}}}{\Gamma(\psi(2S) \rightarrow J/\psi(1S) \pi^+ \pi^-) \times \Gamma_{47} / \Gamma \times \Gamma_{128}^{\psi(2S)} / \Gamma_{11}^{\psi(2S)}}$$

VALUE (units 10^{-4})	DOCUMENT ID	TECN	COMMENT
8.0 ± 0.8 OUR FIT			
6.1 ± 0.8 ± 0.9	¹ BAI	99B BES	$\psi(2S) \rightarrow \gamma 2K^+ 2K^-$

¹ Calculated by us. The value of $B(\chi_{c0} \rightarrow 2K^+ 2K^-)$ reported by BAI 99B was derived using $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.3 \pm 0.8)\%$ and $B(\psi(2S) \rightarrow J/\psi \pi^+ \pi^-) = (32.4 \pm 2.6)\%$ [BAI 98D].

$$\frac{\Gamma(\chi_{c0}(1P) \rightarrow \phi\phi) / \Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) / \Gamma_{\text{total}}}{\Gamma_{49} / \Gamma \times \Gamma_{128}^{\psi(2S)} / \Gamma_{\psi(2S)}}$$

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
0.77 ± 0.07 OUR FIT				
0.78 ± 0.08 OUR AVERAGE				
0.77 ± 0.03 ± 0.08	612	¹ ABLIKIM	11K BES3	$\psi(2S) \rightarrow \gamma$ hadrons
0.86 ± 0.19 ± 0.12	26	² ABLIKIM	06T BES2	$\psi(2S) \rightarrow \gamma 2K^+ 2K^-$

¹ Calculated by us. The value of $B(\chi_{c0} \rightarrow \phi\phi)$ reported by ABLIKIM 11K was derived using $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.62 \pm 0.31)\%$.

² Calculated by us. The value of $B(\chi_{c0} \rightarrow \phi\phi)$ reported by ABLIKIM 06T was derived using $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.2 \pm 0.4)\%$.

$$\frac{\Gamma(\chi_{c0}(1P) \rightarrow \phi\phi) / \Gamma_{\text{total}} \times \Gamma(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) / \Gamma_{\text{total}}}{\Gamma(\psi(2S) \rightarrow J/\psi(1S) \pi^+ \pi^-) \times \Gamma_{49} / \Gamma \times \Gamma_{128}^{\psi(2S)} / \Gamma_{11}^{\psi(2S)}}$$

VALUE (units 10^{-4})	DOCUMENT ID	TECN	COMMENT
2.24 ± 0.21 OUR FIT			
2.6 ± 1.0 ± 1.1	¹ BAI	99B BES	$\psi(2S) \rightarrow \gamma 2K^+ 2K^-$

¹ Calculated by us. The value of $B(\chi_{c0} \rightarrow \phi\phi)$ reported by BAI 99B was derived using $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.3 \pm 0.8)\%$ and $B(\psi(2S) \rightarrow J/\psi \pi^+ \pi^-) = (32.4 \pm 2.6)\%$ [BAI 98D].

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ABLIKIM	13H	PR D87 032007	M. Ablikim <i>et al.</i>	(BES III Collab.)
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UEHARA	13	PTEP 2013 123C01	S. Uehara <i>et al.</i>	(BELLE Collab.)
ABLIKIM	12A	PR D85 112008	M. Ablikim <i>et al.</i>	(BES III Collab.)
ABLIKIM	12I	PR D86 052004	M. Ablikim <i>et al.</i>	(BES III Collab.)
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LIU	12B	PRL 108 232001	Z.Q. Liu <i>et al.</i>	(BELLE Collab.)
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CHEN	07B	PL B651 15	W.T. Chen <i>et al.</i>	(BELLE Collab.)
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