$\chi_{c0}(1P)$

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

$\chi_{c0}(1P)$ 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	$\gamma\gamma \to \chi_{c0} \to$ hadrons
3406 ± 7 ±6	230	[1] ABE	07	BELL	$e^+e^- \to J/\psi(c\overline{c})$
3414.21± 0.39±0.27		ABLIKIM	05G	BES2	$\psi(2S) \to \gamma\chi_{c0}$
3414.7 $^{+\ 0.7}_{-\ 0.6}$ ±0.2		[2] ANDREOTTI	03	E835	$\overline{p}p \to \chi_{c0} \to \pi^0\pi^0$
3415.5 ± 0.4 ±0.4	392	[3] BAGNASCO	02	E835	$\overline{p}p \to \chi_{c0} \to J/\psi\gamma$
3417.4 $^{+\ 1.8}_{-\ 1.9}$ ±0.2		[2] AMBROGIANI	99B	E835	$\overline{p}p \to e^+e^-\gamma$
3414.1 ± 0.6 ±0.8		BAI	99B	BES	$\psi(2S) \to \gamma$X
3417.8 ± 0.4 ±4		[2] GAISER	86	CBAL	$\psi(2S) \to \gamma$X
3416 ± 3 ±4		[4] TANENBAUM	78	MRK1	e^+e^-
• • • We do not use the following data for averages, fits, limits, etc. • • •					
3416.5 ± 3.0		EISENSTEIN	01	CLE2	$e^+e^- \to e^+e^-\chi_{c0}$
3422 ±10		[4] BARTEL	78B	CNTR	$e^+e^- \to J/\psi 2\gamma$
3415 ± 9		[4] BIDDICK	77	CNTR	$e^+e^- \to \gamma$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*
10.4±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	$\gamma\gamma \to \chi_{c0} \to$ hadrons
$12.6^{+1.5+0.9}_{-1.6-1.1}$		ABLIKIM	05G	BES2	$\psi(2S) \to \gamma\chi_{c0}$
$8.6^{+1.7}_{-1.3}$±0.1		ANDREOTTI	03	E835	$\overline{p}p \to \chi_{c0} \to \pi^0\pi^0$
9.7±1.0	392	[5] BAGNASCO	02	E835	$\overline{p}p \to \chi_{c0} \to J/\psi\gamma$
$16.6^{+5.2}_{-3.7}$±0.1		AMBROGIANI	99B	E835	$\overline{p}p \to e^+e^-\gamma$
14.3±2.0±3.0		BAI	98I	BES	$\psi(2S) \to \gamma\pi^+\pi^-$
13.5±3.3±4.2		GAISER	86	CBAL	$\psi(2S) \to \gamma$X, $\gamma\pi^0\pi^0$

[5] Recalculated by ANDREOTTI 05A.

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

	Mode	Fraction (Γ_i/Γ)	Scale factor/ Confidence level
	Hadronic decays		
Γ_1	$2(\pi^+\pi^-)$	(2.26 ± 0.19) %	
Γ_2	$\rho^0\pi^+\pi^-$	$(8.8\ \pm2.8\ )\times10^{-3}$	
Γ_3	$\rho^0\rho^0$		
Γ_4	$f_0(980)\,f_0(980)$	$(6.7\ \pm2.1\ )\times10^{-4}$	
Γ_5	$\pi^+\pi^-\pi^0\pi^0$	$(3.4\ \pm0.4\ )$ %	
Γ_6	$\rho^+\pi^-\pi^0+$ c.c.	$(2.9\ \pm0.4\ )$ %	
Γ_7	$4\pi^0$	$(3.3\ \pm0.4\ )\times10^{-3}$	
Γ_8	$\pi^+\pi^-K^+K^-$	(1.79 ± 0.15) %	
Γ_9	$K_0^*(1430)^0\overline{K}_0^*(1430)^0\to$ $\pi^+\pi^-K^+K^-$	$(9.9\ ^{+4.0}_{-2.9}\ )\times10^{-4}$	
Γ_{10}	$K_0^*(1430)^0\overline{K}_2^*(1430)^0+$ c.c. $\to$ $\pi^+\pi^-K^+K^-$	$(8.1\ ^{+2.0}_{-2.4}\ )\times10^{-4}$	
Γ_{11}	$K_1(1270)^+K^-+$ c.c. $\to$ $\pi^+\pi^-K^+K^-$	$(6.3\ \pm1.9\ )\times10^{-3}$	
Γ_{12}	$K_1(1400)^+K^-+$ c.c. $\to$ $\pi^+\pi^-K^+K^-$	$<2.7\times10^{-3}$	CL=90%
Γ_{13}	$f_0(980)\,f_0(980)$	$(1.6\ ^{+1.1}_{-0.9}\ )\times10^{-4}$	
Γ_{14}	$f_0(980)\,f_0(2200)$	$(8.0\ ^{+2.0}_{-2.5}\ )\times10^{-4}$	
Γ_{15}	$f_0(1370)\,f_0(1370)$	$<2.8\times10^{-4}$	CL=90%
Γ_{16}	$f_0(1370)\,f_0(1500)$	$<1.7\times10^{-4}$	CL=90%
Γ_{17}	$f_0(1370)\,f_0(1710)$	$(6.8\ ^{+4.0}_{-2.4}\ )\times10^{-4}$	
Γ_{18}	$f_0(1500)\,f_0(1370)$	$<1.3\times10^{-4}$	CL=90%
Γ_{19}	$f_0(1500)\,f_0(1500)$	$<5\times10^{-5}$	CL=90%
Γ_{20}	$f_0(1500)\,f_0(1710)$	$<7\times10^{-5}$	CL=90%
Γ_{21}	$K^+K^-\pi^0\pi^0$	$(5.6\ \pm0.9\ )\times10^{-3}$	
Γ_{22}	$K^+\pi^-K^0\pi^0+$ c.c.	(2.52 ± 0.34) %	
Γ_{23}	$\rho^+K^-K^0+$ c.c.	(1.22 ± 0.21) %	
Γ_{24}	$K^*(892)^-K^+\pi^0\to$ $K^+\pi^-K^0\pi^0+$ c.c.	$(4.7\ \pm1.2\ )\times10^{-3}$	
Γ_{25}	$K_S^0K_S^0\pi^+\pi^-$	$(5.8\ \pm1.1\ )\times10^{-3}$	
Γ_{26}	$K^+K^-\eta\pi^0$	$(3.0\ \pm0.7\ )\times10^{-3}$	
Γ_{27}	$3(\pi^+\pi^-)$	(1.20 ± 0.18) %	
Γ_{28}	$K^+\overline{K}^*(892)^0\pi^-+$ c.c.	$(7.3\ \pm1.6\ )\times10^{-3}$	
Γ_{29}	$K^*(892)^0\overline{K}^*(892)^0$	$(1.7\ \pm0.6\ )\times10^{-3}$	
Γ_{30}	$\pi\pi$	$(8.5\ \pm0.4\ )\times10^{-3}$	
Γ_{31}	$\pi^0\eta$	$<1.8\times10^{-4}$	
Γ_{32}	$\pi^0\eta'$	$<1.1\times10^{-3}$	
Γ_{33}	$\eta\eta$	$(3.03\pm0.21)\times10^{-3}$	

Γ_{34}	$\eta\eta'$	< 2.4	$\times 10^{-4}$	CL=90%
Γ_{35}	$\eta'\eta'$	(2.02 ± 0.22)	$\times 10^{-3}$	
Γ_{36}	$\omega\omega$	$(2.2\ \pm0.7\ )$	$\times 10^{-3}$	
Γ_{37}	K^+K^-	(6.06 ± 0.35)	$\times 10^{-3}$	
Γ_{38}	$K^0_S K^0_S$	(3.15 ± 0.18)	$\times 10^{-3}$	
Γ_{39}	$\pi^+\pi^-\eta$	< 2.0	$\times 10^{-4}$	CL=90%
Γ_{40}	$\pi^+\pi^-\eta'$	< 4	$\times 10^{-4}$	CL=90%
Γ_{41}	$\overline{K}^0 K^+\pi^-$ + c.c.	< 1.0	$\times 10^{-4}$	CL=90%
Γ_{42}	$K^+K^-\pi^0$	< 6	$\times 10^{-5}$	CL=90%
Γ_{43}	$K^+K^-\eta$	< 2.3	$\times 10^{-4}$	CL=90%
Γ_{44}	$K^+K^-K^0_S K^0_S$	$(1.4\ \pm0.5\ )$	$\times 10^{-3}$	
Γ_{45}	$K^+K^-K^+K^-$	(2.79 ± 0.29)	$\times 10^{-3}$	
Γ_{46}	$K^+K^-\phi$	$(9.8\ \pm2.5\ )$	$\times 10^{-4}$	
Γ_{47}	$\phi\phi$	$(9.1\ \pm1.9\ )$	$\times 10^{-4}$	
Γ_{48}	$p\overline{p}$	(2.23 ± 0.13)	$\times 10^{-4}$	
Γ_{49}	$p\overline{p}\pi^0$	$(7.0\ \pm0.7\ )$	$\times 10^{-4}$	S=1.2
Γ_{50}	$p\overline{p}\eta$	$(3.6\ \pm0.4\ )$	$\times 10^{-4}$	
Γ_{51}	$p\overline{p}\omega$	$(5.3\ \pm0.6\ )$	$\times 10^{-4}$	
Γ_{52}	$\pi^+\pi^- p\overline{p}$	$(2.1\ \pm0.7\ )$	$\times 10^{-3}$	S=1.4
Γ_{53}	$\pi^0\pi^0 p\overline{p}$	(1.05 ± 0.28)	$\times 10^{-3}$	
Γ_{54}	$K^0_S K^0_S p\overline{p}$	< 8.8	$\times 10^{-4}$	CL=90%
Γ_{55}	$p\overline{n}\pi^-$	(1.14 ± 0.31)	$\times 10^{-3}$	
Γ_{56}	$\Lambda\overline{\Lambda}$	$(3.3\ \pm0.4\ )$	$\times 10^{-4}$	
Γ_{57}	$\Lambda\overline{\Lambda}\pi^+\pi^-$	< 4.0	$\times 10^{-3}$	CL=90%
Γ_{58}	$K^+\overline{p}\Lambda$ + c.c.	(1.02 ± 0.19)	$\times 10^{-3}$	
Γ_{59}	$\Sigma^0\overline{\Sigma}^0$	$(4.2\ \pm0.7\ )$	$\times 10^{-4}$	
Γ_{60}	$\Sigma^+\overline{\Sigma}^-$	$(3.1\ \pm0.7\ )$	$\times 10^{-4}$	
Γ_{61}	$\Xi^0\overline{\Xi}^0$	$(3.2\ \pm0.8\ )$	$\times 10^{-4}$	
Γ_{62}	$\Xi^-\overline{\Xi}^+$	$(4.9\ \pm0.7\ )$	$\times 10^{-4}$	

Radiative decays

Γ_{63}	$\gamma J/\psi(1S)$	(1.17 ± 0.08) %		
Γ_{64}	$\gamma\rho^0$	< 9	$\times 10^{-6}$	CL=90%
Γ_{65}	$\gamma\omega$	< 8	$\times 10^{-6}$	CL=90%
Γ_{66}	$\gamma\phi$	< 6	$\times 10^{-6}$	CL=90%
Γ_{67}	$\gamma\gamma$	(2.23 ± 0.17)	$\times 10^{-4}$	

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, 24 combinations of partial widths obtained from integrated cross section, and 83 branching ratios uses 218 measurements to determine 48 parameters. The overall fit has a $\chi^2 = 307.7$ for 170 degrees of freedom.

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

x_2	26									
x_8	20	5								
x_{28}	9	2	30							
x_{30}	22	6	23	8						
x_{33}	13	3	14	5	28					
x_{37}	20	5	20	7	36	23				
x_{38}	22	6	22	8	35	22	30			
x_{45}	13	3	12	5	19	12	16	17		
x_{47}	7	2	6	3	9	6	8	8	5	
x_{48}	2	1	2	1	−6	−7	2	2	1	1
x_{56}	8	2	9	3	17	11	15	14	8	4
x_{63}	2	1	3	1	13	10	8	6	4	2
x_{67}	−26	−7	−18	−10	−9	−4	−10	−15	−9	−5
Γ	−14	−4	−12	−6	−12	−8	−11	−13	−7	−4
	x_1	x_2	x_8	x_{28}	x_{30}	x_{33}	x_{37}	x_{38}	x_{45}	x_{47}

x_{56}	1			
x_{63}	−46	4		
x_{67}	−6	−3	11	
Γ	3	−5	−10	−57
	x_{48}	x_{56}	x_{63}	x_{67}

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

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

$\Gamma(p\overline{p})$ × $\Gamma(\gamma J/\psi(1S))/\Gamma_{\rm total}$ **$\Gamma_{48}\Gamma_{63}/\Gamma$**

VALUE (eV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
27.1± 2.4 OUR FIT					
• • • We do not use the following data for averages, fits, limits, etc. • • •					
26.6± 2.6±1.4	392	[6,7] BAGNASCO	02	E835	$\overline{p}p \to \chi_{c0} \to J/\psi\gamma$
$48.7^{+11.3}_{-8.9}$±2.4		[6,7] AMBROGIANI	99B	E835	$\overline{p}p \to \gamma J/\psi$

[6] Calculated by us using $B(J/\psi(1S) \to e^+e^-) = 0.0593 \pm 0.0010$.

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

$\chi_{c0}(1P)$ Γ(i)Γ(γγ)/Γ(total)

$\Gamma(\pi\pi) \times \Gamma(\gamma\gamma)/\Gamma_{total}$ — $\Gamma_{30}\Gamma_{67}/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID		TECN	COMMENT
19.7± 1.4 OUR FIT					
23 ± 5 OUR AVERAGE					
$29.7^{+17.4}_{-12.0} \pm 4.8$	103^{+60}_{-42}	[8] UEHARA	09	BELL	10.6 $e^+e^- \to e^+e^-\pi^0\pi^0$
22.7± 3.2±3.5	129 ± 18	[9] NAKAZAWA	05	BELL	10.6 $e^+e^- \to e^+e^-\pi^+\pi^-$

[8] We multiplied the measurement by 3 to convert from $\pi^0\pi^0$ to $\pi\pi$. Interference with the continuum included.

[9] We have multiplied $\pi^+\pi^-$ measurement by 3/2 to obtain $\pi\pi$.

$\Gamma(\eta\eta) \times \Gamma(\gamma\gamma)/\Gamma_{total}$ — $\Gamma_{33}\Gamma_{67}/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID		TECN	COMMENT
9.4±2.3±1.2	22	[10] UEHARA	10A	BELL	10.6 $e^+e^- \to e^+e^-\eta\eta$

[10] Interference with the continuum not included.

$\Gamma(K^+K^-) \times \Gamma(\gamma\gamma)/\Gamma_{total}$ — $\Gamma_{37}\Gamma_{67}/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID		TECN	COMMENT
14.0±1.1 OUR FIT					
14.3±1.6±2.3	153 ± 17	NAKAZAWA	05	BELL	10.6 $e^+e^- \to e^+e^-K^+K^-$

$\Gamma(K^0_S K^0_S) \times \Gamma(\gamma\gamma)/\Gamma_{total}$ — $\Gamma_{38}\Gamma_{67}/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID		TECN	COMMENT
7.3 ±0.5 OUR FIT					
7.00±0.65±0.71	134 ± 12	CHEN	07B	BELL	$e^+e^- \to e^+e^-\chi_{c0}$

$\Gamma(2(\pi^+\pi^-)) \times \Gamma(\gamma\gamma)/\Gamma_{total}$ — $\Gamma_1\Gamma_{67}/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID		TECN	COMMENT
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	$\gamma\gamma \to \chi_{c0} \to 2(\pi^+\pi^-)$
75 ±13 ±8		EISENSTEIN	01	CLE2	$e^+e^- \to e^+e^-\chi_{c0}$

$\Gamma(\rho^0\rho^0) \times \Gamma(\gamma\gamma)/\Gamma_{total}$ — $\Gamma_3\Gamma_{67}/\Gamma$

VALUE (eV)	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<12	90	<252	UEHARA	08	BELL	$\gamma\gamma \to \chi_{c0} \to 2(\pi^+\pi^-)$

$\Gamma(\pi^+\pi^-K^+K^-) \times \Gamma(\gamma\gamma)/\Gamma_{total}$ — $\Gamma_8\Gamma_{67}/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID		TECN	COMMENT
41 ±4 OUR FIT					
38.8±3.7±4.7	1.7k	UEHARA	08	BELL	$\gamma\gamma \to \chi_{c0} \to K^+K^-\pi^+\pi^-$

$\Gamma(K^+\overline{K}^*(892)^0\pi^- + \text{c.c.}) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ $\Gamma_{28}\Gamma_{67}/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID		TECN	COMMENT
17 ±4 OUR FIT					
16.7±6.1±3.0	495 ± 182	UEHARA	08	BELL	$\gamma\gamma \to \chi_{c0} \to K^+K^-\pi^+\pi^-$

$\Gamma(K^*(892)^0\overline{K}^*(892)^0) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ $\Gamma_{29}\Gamma_{67}/\Gamma$

VALUE (eV)	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<6	90	<148	UEHARA	08	BELL	$\gamma\gamma \to \chi_{c0} \to K^+K^-\pi^+\pi^-$

$\Gamma(K^+K^-K^+K^-) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ $\Gamma_{45}\Gamma_{67}/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID		TECN	COMMENT
6.4±0.7 OUR FIT					
7.9±1.3±1.1	215 ± 36	UEHARA	08	BELL	$\gamma\gamma \to \chi_{c0} \to 2(K^+K^-)$

$\Gamma(\phi\phi) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ $\Gamma_{47}\Gamma_{67}/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID		TECN	COMMENT
2.1±0.5 OUR FIT					
2.3±0.9±0.4	23.6 ± 9.6	UEHARA	08	BELL	$\gamma\gamma \to \chi_{c0} \to 2(K^+K^-)$

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

HADRONIC DECAYS

$\Gamma(2(\pi^+\pi^-))/\Gamma_{\text{total}}$ Γ_1/Γ

VALUE	DOCUMENT ID
0.0226±0.0019 OUR FIT	

$\Gamma(\rho^0\pi^+\pi^-)/\Gamma(2(\pi^+\pi^-))$ Γ_2/Γ_1

VALUE	DOCUMENT ID		TECN	COMMENT
0.39±0.12 OUR FIT				
0.39±0.12	TANENBAUM	78	MRK1	$\psi(2S) \to \gamma\chi_{c0}$

$\Gamma(\rho^0\pi^+\pi^-)/\Gamma_{\text{total}}$ Γ_2/Γ

VALUE	DOCUMENT ID
0.0088±0.0028 OUR FIT	

$\Gamma(f_0(980)f_0(980))/\Gamma_{\text{total}}$ Γ_4/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
6.7±2.1±0.2	36 ± 9	[11] ABLIKIM	04G	BES	$\psi(2S) \to \gamma 2\pi^+ 2\pi^-$

[11] ABLIKIM 04G reports $[\Gamma(\chi_{c0}(1P) \to f_0(980)f_0(980))/\Gamma_{\text{total}}] \times [\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P))] = (6.5 \pm 1.6 \pm 1.3) \times 10^{-5}$ which we divide by our best value $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.68 \pm 0.31) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\pi^+\pi^-\pi^0\pi^0)/\Gamma_{total}$ Γ_5/Γ

VALUE (%)	EVTS	DOCUMENT ID		TECN	COMMENT
3.4±0.4±0.1	1751.4	[12] HE	08B	CLEO	$e^+e^- \to \gamma h^+ h^- h^0 h^0$

[12] HE 08B reports 3.54 ± 0.10 ± 0.43 ± 0.18 % from a measurement of $[\Gamma(\chi_{c0}(1P) \to \pi^+\pi^-\pi^0\pi^0)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.68 \pm 0.31) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\rho^+\pi^-\pi^0 + \text{c.c.})/\Gamma_{total}$ Γ_6/Γ

VALUE (%)	EVTS	DOCUMENT ID		TECN	COMMENT
2.9±0.4±0.1	1358.5	[13,14] HE	08B	CLEO	$e^+e^- \to \gamma h^+ h^- h^0 h^0$

[13] HE 08B reports 3.04 ± 0.18 ± 0.42 ± 0.16 % from a measurement of $[\Gamma(\chi_{c0}(1P) \to \rho^+\pi^-\pi^0 + \text{ c.c.})/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.68 \pm 0.31) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[14] 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.

$\Gamma(4\pi^0)/\Gamma_{total}$ Γ_7/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
3.3±0.4±0.1	3296	[15] ABLIKIM	11A	BES3	$e^+e^- \to \psi(2S) \to \gamma\chi_{c0}$

[15] ABLIKIM 11A reports $(3.34 \pm 0.06 \pm 0.44) \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \to 4\pi^0)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.62 \pm 0.31) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.68 \pm 0.31) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

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

VALUE (units 10^{-3})	DOCUMENT ID
17.9±1.5 OUR FIT	

$\Gamma(K^+\overline{K}^*(892)^0\pi^- + \text{c.c.})/\Gamma(\pi^+\pi^-K^+K^-)$ Γ_{28}/Γ_8

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

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

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
$\mathbf{9.9^{+3.6}_{-2.8} \pm 0.3}$	83	[16] ABLIKIM	05Q	BES2	$\psi(2S) \to \gamma\pi^+\pi^-K^+K^-$

[16] ABLIKIM 05Q reports $(10.44 \pm 2.37^{+3.05}_{-1.90}) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \to K_0^*(1430)^0\overline{K}_0^*(1430)^0 \to \pi^+\pi^-K^+K^-)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.68 \pm 0.31) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

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

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
$\mathbf{8.1^{+2.0}_{-2.4}\pm0.3}$	62	[17] ABLIKIM	05Q	BES2	$\psi(2S) \to \gamma\pi^+\pi^-K^+K^-$

[17] ABLIKIM 05Q reports $(8.49\pm1.66^{+1.32}_{-1.99})\times10^{-4}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \to K_0^*(1430)^0\overline{K}_2^*(1430)^0 + \text{c.c.} \to \pi^+\pi^-K^+K^-)/\Gamma_{\text{total}}] \times [\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P))]$ assuming $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.68 \pm 0.31) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

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

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
$\mathbf{6.3\pm1.9\pm0.2}$	68	[18] ABLIKIM	05Q	BES2	$\psi(2S) \to \gamma\pi^+\pi^-K^+K^-$

[18] ABLIKIM 05Q reports $(6.66\pm1.31^{+1.60}_{-1.51})\times10^{-3}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \to K_1(1270)^+K^- + \text{c.c.} \to \pi^+\pi^-K^+K^-)/\Gamma_{\text{total}}] \times [\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P))]$ assuming $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.68 \pm 0.31) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. The measurement assumes $\text{B}(K_1(1270) \to K\rho(770)) = 42 \pm 6\%$.

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

VALUE (units 10^{-3})	CL%	DOCUMENT ID		TECN	COMMENT
$\mathbf{<2.7}$	90	[19] ABLIKIM	05Q	BES2	$\psi(2S) \to \gamma\pi^+\pi^-K^+K^-$

[19] ABLIKIM 05Q reports $< 2.85 \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \to K_1(1400)^+K^- + \text{c.c.} \to \pi^+\pi^-K^+K^-)/\Gamma_{\text{total}}] \times [\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P))]$ assuming $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = 9.68 \times 10^{-2}$. The measurement assumes $\text{B}(K_1(1400) \to K^*(892)\pi) = 94 \pm 6\%$.

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

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
$\mathbf{16^{+11}_{-9}\pm1}$	28	[20] ABLIKIM	05Q	BES2	$\psi(2S) \to \gamma\pi^+\pi^-K^+K^-$

[20] ABLIKIM 05Q reports $[\Gamma(\chi_{c0}(1P) \to f_0(980)f_0(980))/\Gamma_{\text{total}}] \times [\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P))] = (1.59\pm0.50^{+0.89}_{-0.72})\times10^{-5}$ which we divide by our best value $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.68 \pm 0.31) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. One of the $f_0(980)$ mesons is identified via decay to $\pi^+\pi^-$ while the other via K^+K^- decay.

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

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
$\mathbf{8.0^{+2.0}_{-2.5}\pm0.3}$	77	[21] ABLIKIM	05Q	BES2	$\psi(2S) \to \gamma\pi^+\pi^-K^+K^-$

[21] ABLIKIM 05Q reports $(8.42 \pm 1.42^{+1.65}_{-2.29}) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \to f_0(980) f_0(2200))/\Gamma_{\text{total}}] \times [\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P))]$ assuming $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.68 \pm 0.31) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. The f_0 mesons are identified via $f_0(980) \to \pi^+\pi^-$ and $f_0(2200) \to K^+K^-$ decays.

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

VALUE (units 10^{-4})	*CL%*	*DOCUMENT ID*		*TECN*	*COMMENT*
<2.8	90	[22] ABLIKIM	05Q	BES2	$\psi(2S) \to \gamma\pi^+\pi^- K^+K^-$

[22] ABLIKIM 05Q reports $< 2.9 \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \to f_0(1370) f_0(1370))/\Gamma_{\text{total}}] \times [\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P))]$ assuming $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = 9.68 \times 10^{-2}$. 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

VALUE (units 10^{-4})	*CL%*	*DOCUMENT ID*		*TECN*	*COMMENT*
<1.7	90	[23] ABLIKIM	05Q	BES2	$\psi(2S) \to \gamma\pi^+\pi^- K^+K^-$

[23] ABLIKIM 05Q reports $< 1.8 \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \to f_0(1370) f_0(1500))/\Gamma_{\text{total}}] \times [\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P))]$ assuming $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = 9.68 \times 10^{-2}$. The f_0 mesons are identified via $f_0(1370) \to \pi^+\pi^-$ and $f_0(1500) \to K^+K^-$ 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

VALUE (units 10^{-4})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
$\mathbf{6.8^{+3.6}_{-2.4} \pm 0.2}$	61	[24] ABLIKIM	05Q	BES2	$\psi(2S) \to \gamma\pi^+\pi^- K^+K^-$

[24] ABLIKIM 05Q reports $(7.12 \pm 1.85^{+3.28}_{-1.68}) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \to f_0(1370) f_0(1710))/\Gamma_{\text{total}}] \times [\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P))]$ assuming $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.68 \pm 0.31) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. The f_0 mesons are identified via $f_0(1370) \to \pi^+\pi^-$ and $f_0(1710) \to K^+K^-$ 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

VALUE (units 10^{-4})	*CL%*	*DOCUMENT ID*		*TECN*	*COMMENT*
<1.3	90	[25] ABLIKIM	05Q	BES2	$\psi(2S) \to \gamma\pi^+\pi^- K^+K^-$

[25] ABLIKIM 05Q reports $< 1.4 \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \to f_0(1500) f_0(1370))/\Gamma_{\text{total}}] \times [\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P))]$ assuming $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = 9.68 \times 10^{-2}$. The f_0 mesons are identified via $f_0(1500) \to \pi^+\pi^-$ and $f_0(1370) \to K^+K^-$ decays. Both branching fractions for these f_0 decays are implicitly included in the quoted result.

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

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<0.5	90	[26] ABLIKIM	05Q	BES2	$\psi(2S) \to \gamma\pi^+\pi^- K^+K^-$

[26] ABLIKIM 05Q reports $< 0.55 \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \to f_0(1500)f_0(1500))/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = 9.68 \times 10^{-2}$. 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.

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

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<0.7	90	[27] ABLIKIM	05Q	BES2	$\psi(2S) \to \gamma\pi^+\pi^- K^+K^-$

[27] ABLIKIM 05Q reports $< 0.73 \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \to f_0(1500)f_0(1710))/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = 9.68 \times 10^{-2}$. The f_0 mesons are identified via $f_0(1500) \to \pi^+\pi^-$ and $f_0(1710) \to K^+K^-$ decays. Both branching fractions for these f_0 decays are implicitly included in the quoted result.

$\Gamma(K^+K^-\pi^0\pi^0)/\Gamma_{total}$ Γ_{21}/Γ

VALUE (%)	EVTS	DOCUMENT ID		TECN	COMMENT
0.56±0.09±0.02	213.5	[28] HE	08B	CLEO	$e^+e^- \to \gamma h^+h^-h^0h^0$

[28] HE 08B reports 0.59 ± 0.05 ± 0.08 ± 0.03 % from a measurement of $[\Gamma(\chi_{c0}(1P) \to K^+K^-\pi^0\pi^0)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.68 \pm 0.31) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

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

VALUE (%)	EVTS	DOCUMENT ID		TECN	COMMENT
2.52±0.33±0.08	401.7	[29] HE	08B	CLEO	$e^+e^- \to \gamma h^+h^-h^0h^0$

[29] HE 08B reports 2.64 ± 0.15 ± 0.31 ± 0.14 % from a measurement of $[\Gamma(\chi_{c0}(1P) \to K^+\pi^-K^0\pi^0 + \text{c.c.})/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.68 \pm 0.31) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

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

VALUE (%)	EVTS	DOCUMENT ID		TECN	COMMENT
1.22±0.21±0.04	179.7	[30] HE	08B	CLEO	$e^+e^- \to \gamma h^+h^-h^0h^0$

[30] HE 08B reports 1.28 ± 0.16 ± 0.15 ± 0.07 % from a measurement of $[\Gamma(\chi_{c0}(1P) \to \rho^+K^-K^0 + \text{c.c.})/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.68 \pm 0.31) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

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

VALUE (%)	EVTS	DOCUMENT ID		TECN	COMMENT
0.47±0.12±0.01	64.1	[31] HE	08B	CLEO	$e^+e^- \to \gamma h^+ h^- h^0 h^0$

[31] HE 08B reports 0.49 ± 0.10 ± 0.07 ± 0.03 % from a measurement of $[\Gamma(\chi_{c0}(1P) \to K^*(892)^- K^+ \pi^0 \to K^+ \pi^- K^0 \pi^0 + \text{c.c.})/\Gamma_{\text{total}}] \times [\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P))]$ assuming $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.68 \pm 0.31) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(K^0_S K^0_S \pi^+ \pi^-)/\Gamma_{\text{total}}$ Γ_{25}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
5.8±1.1±0.2	152 ± 14	[32] ABLIKIM	05O	BES2	$\psi(2S) \to \gamma\chi_{c0}$

[32] ABLIKIM 05O reports $[\Gamma(\chi_{c0}(1P) \to K^0_S K^0_S \pi^+ \pi^-)/\Gamma_{\text{total}}] \times [\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P))] = (0.558 \pm 0.051 \pm 0.089) \times 10^{-3}$ which we divide by our best value $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.68 \pm 0.31) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

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

VALUE (%)	EVTS	DOCUMENT ID		TECN	COMMENT
0.30±0.07±0.01	56.4	[33] HE	08B	CLEO	$e^+e^- \to \gamma h^+ h^- h^0 h^0$

[33] HE 08B reports 0.32 ± 0.05 ± 0.05 ± 0.02 % from a measurement of $[\Gamma(\chi_{c0}(1P) \to K^+ K^- \eta \pi^0)/\Gamma_{\text{total}}] \times [\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P))]$ assuming $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.68 \pm 0.31) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(3(\pi^+\pi^-))/\Gamma_{\text{total}}$ Γ_{27}/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	[34] BAI	99B	BES	$\psi(2S) \to \gamma\chi_{c0}$
12.5±2.9±0.5	[34] TANENBAUM	78	MRK1	$\psi(2S) \to \gamma\chi_{c0}$

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

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

VALUE	DOCUMENT ID
0.0073±0.0016 OUR FIT	

$\Gamma(K^*(892)^0 \overline{K}^*(892)^0)/\Gamma_{\text{total}}$ Γ_{29}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
$\mathbf{1.7^{+0.6}_{-0.5}\pm0.1}$	64	[35] ABLIKIM	05Q	BES2	$\psi(2S) \to \gamma\pi^+\pi^- K^+ K^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1.6±0.4±0.1	30.1±5.7	[36,37] ABLIKIM	04H	BES	Repl. by ABLIKIM 05Q

[35] ABLIKIM 05Q reports $[\Gamma(\chi_{c0}(1P) \to K^*(892)^0\overline{K}^*(892)^0)/\Gamma_{\rm total}] \times [B(\psi(2S) \to \gamma\chi_{c0}(1P))] = (0.168 \pm 0.035^{+0.047}_{-0.040}) \times 10^{-3}$ which we divide by our best value $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.68 \pm 0.31) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[36] Assumes $B(K^*(892)^0 \to K^-\pi^+) = 2/3$.

[37] ABLIKIM 04H reports $[\Gamma(\chi_{c0}(1P) \to K^*(892)^0\overline{K}^*(892)^0)/\Gamma_{\rm total}] \times [B(\psi(2S) \to \gamma\chi_{c0}(1P))] = (1.53 \pm 0.29 \pm 0.26) \times 10^{-4}$ which we divide by our best value $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.68 \pm 0.31) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\pi\pi)/\Gamma_{\rm total}$ Γ_{30}/Γ

VALUE (units 10^{-3})	*DOCUMENT ID*
8.5±0.4 OUR FIT	

$\Gamma(\eta\eta)/\Gamma_{\rm total}$ Γ_{33}/Γ

VALUE (units 10^{-3})	*DOCUMENT ID*
3.03±0.21 OUR FIT	

$\Gamma(\eta\eta)/\Gamma(\pi\pi)$ Γ_{33}/Γ_{30}

VALUE	*DOCUMENT ID*		*TECN*	*COMMENT*
0.356±0.025 OUR FIT				
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.26 \pm 0.09\ ^{+0.03}_{-0.02}$	[38] ANDREOTTI	05C	E835	$\overline{p}p \to$ 2 mesons
$0.24 \pm 0.10 \pm 0.08$	[38] BAI	03C	BES	$\psi(2S) \to 5\gamma$

[38] We have multiplied $\pi^0\pi^0$ measurement by 3 to obtain $\pi\pi$.

$\Gamma(\eta\eta')/\Gamma_{\rm total}$ Γ_{34}/Γ

VALUE (units 10^{-3})	*CL%*	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
<0.24	90	35 ± 13	[39] ASNER	09	CLEO	$\psi(2S) \to \gamma\eta'\eta$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<0.5	90		[40] ADAMS	07	CLEO	$\psi(2S) \to \gamma\chi_{c0}$

[39] ASNER 09 reports $< 0.25 \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \to \eta\eta')/\Gamma_{\rm total}] \times [B(\psi(2S) \to \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = 9.68 \times 10^{-2}$.

[40] Superseded by ASNER 09. ADAMS 07 reports $< 0.5 \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \to \eta\eta')/\Gamma_{\rm total}] \times [B(\psi(2S) \to \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = 9.68 \times 10^{-2}$.

$\Gamma(\eta'\eta')/\Gamma_{\rm total}$ Γ_{35}/Γ

VALUE (units 10^{-3})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
2.02±0.21±0.06	0.4k	[41] ASNER	09	CLEO	$\psi(2S) \to \gamma\eta'\eta'$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$1.6 \pm 0.4 \pm 0.1$	23	[42] ADAMS	07	CLEO	$\psi(2S) \to \gamma\chi_{c0}$

[41] ASNER 09 reports $(2.12 \pm 0.13 \pm 0.21) \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \to \eta'\eta')/\Gamma_{\text{total}}] \times [\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P))]$ assuming $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.68 \pm 0.31) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[42] Superseded by ASNER 09. ADAMS 07 reports $(1.7 \pm 0.4 \pm 0.2) \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \to \eta'\eta')/\Gamma_{\text{total}}] \times [\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P))]$ assuming $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = 0.0922 \pm 0.0011 \pm 0.0046$, which we rescale to our best value $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.68 \pm 0.31) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\omega\omega)/\Gamma_{\text{total}}$ Γ_{36}/Γ

VALUE (units 10^{-3})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
2.2±0.7±0.1	38.1 ± 9.6	[43] ABLIKIM	05N	BES2	$\psi(2S) \to \gamma\chi_{c0} \to \gamma 6\pi$

[43] ABLIKIM 05N reports $[\Gamma(\chi_{c0}(1P) \to \omega\omega)/\Gamma_{\text{total}}] \times [\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P))] = (0.212 \pm 0.053 \pm 0.037) \times 10^{-3}$ which we divide by our best value $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.68 \pm 0.31) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

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

VALUE (units 10^{-3})	*DOCUMENT ID*
6.06±0.35 OUR FIT	

$\Gamma(K^0_S K^0_S)/\Gamma_{\text{total}}$ Γ_{38}/Γ

VALUE (units 10^{-3})	*DOCUMENT ID*
3.15±0.18 OUR FIT	

$\Gamma(K^0_S K^0_S)/\Gamma(\pi\pi)$ Γ_{38}/Γ_{30}

VALUE	*DOCUMENT ID*	*TECN*	*COMMENT*
0.369±0.022 OUR FIT			

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

$0.31 \pm 0.05 \pm 0.05$	[44,45] CHEN	07B	BELL	$e^+e^- \to e^+e^-\chi_{c0}$

[44] 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 $\pi\pi$.

[45] Not independent from other measurements.

$\Gamma(K^0_S K^0_S)/\Gamma(K^+K^-)$ Γ_{38}/Γ_{37}

VALUE	*DOCUMENT ID*	*TECN*	*COMMENT*
0.519±0.035 OUR FIT			

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

$0.49 \pm 0.07 \pm 0.08$	[46,47] CHEN	07B	BELL	$e^+e^- \to e^+e^-\chi_{c0}$

[46] Using $\Gamma(K^+K^-) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ from NAKAZAWA 05.

[47] Not independent from other measurements.

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

VALUE (units 10^{-3})	*CL%*	*DOCUMENT ID*		*TECN*	*COMMENT*
<0.20	90	[48] ATHAR	07	CLEO	$\psi(2S) \to \gamma h^+ h^- h^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<1.0	90	[49] ABLIKIM	06R	BES2	$\psi(2S) \to \gamma\chi_{c0}$

[48] ATHAR 07 reports $< 0.21 \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \to \pi^+\pi^-\eta)/\Gamma_{\text{total}}] \times [\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P))]$ assuming $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = 9.68 \times 10^{-2}$.

[49] ABLIKIM 06R reports $< 1.1 \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \to \pi^+\pi^-\eta)/\Gamma_{\text{total}}] \times [\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P))]$ assuming $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.2 \pm 0.4) \times 10^{-2}$, which we rescale to our best value $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = 9.68 \times 10^{-2}$.

$\Gamma(\pi^+\pi^-\eta')/\Gamma_{\text{total}}$ Γ_{40}/Γ

VALUE (units 10^{-3})	*CL%*	*DOCUMENT ID*		*TECN*	*COMMENT*
<0.4	90	[50] ATHAR	07	CLEO	$\psi(2S) \to \gamma h^+ h^- h^0$

[50] ATHAR 07 reports $< 0.38 \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \to \pi^+\pi^-\eta')/\Gamma_{\text{total}}] \times [\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P))]$ assuming $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = 9.68 \times 10^{-2}$.

$\Gamma(\overline{K}^0 K^+\pi^- + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{41}/Γ

VALUE (units 10^{-3})	*CL%*	*DOCUMENT ID*		*TECN*	*COMMENT*
<0.10	90	[51] ATHAR	07	CLEO	$\psi(2S) \to \gamma h^+ h^- h^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.7	90	[52,53] ABLIKIM	06R	BES2	$\psi(2S) \to \gamma\chi_{c0}$
<0.7	90	[53,54] BAI	99B	BES	$\psi(2S) \to \gamma\chi_{c0}$

[51] ATHAR 07 reports $< 0.10 \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \to \overline{K}^0 K^+\pi^- + \text{c.c.})/\Gamma_{\text{total}}] \times [\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P))]$ assuming $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = 9.68 \times 10^{-2}$.

[52] ABLIKIM 06R reports $< 0.70 \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \to \overline{K}^0 K^+\pi^- + \text{c.c.})/\Gamma_{\text{total}}] \times [\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P))]$ assuming $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.2 \pm 0.4) \times 10^{-2}$, which we rescale to our best value $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = 9.68 \times 10^{-2}$.

[53] We have multiplied the $K^0_S K^+\pi^-$ measurement by a factor of 2 to convert to $K^0 K^+\pi^-$.

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

$\Gamma(K^+K^-\pi^0)/\Gamma_{\text{total}}$ Γ_{42}/Γ

VALUE (units 10^{-3})	*CL%*	*DOCUMENT ID*		*TECN*	*COMMENT*
<0.06	90	[55] ATHAR	07	CLEO	$\psi(2S) \to \gamma h^+ h^- h^0$

[55] ATHAR 07 reports $< 0.06 \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \to K^+K^-\pi^0)/\Gamma_{\text{total}}] \times [\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P))]$ assuming $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = 9.68 \times 10^{-2}$.

$\Gamma(K^+K^-\eta)/\Gamma_{total}$ Γ_{43}/Γ

VALUE (units 10^{-3})	CL%	DOCUMENT ID		TECN	COMMENT
<0.23	90	[56] ATHAR	07	CLEO	$\psi(2S) \to \gamma h^+ h^- h^0$

[56] ATHAR 07 reports $< 0.24 \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \to K^+K^-\eta)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = 9.68 \times 10^{-2}$.

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

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
1.43±0.48±0.05	16.8 ± 4.8	[57] ABLIKIM	05O	BES2	$\psi(2S) \to \gamma\chi_{c0}$

[57] ABLIKIM 05O reports $[\Gamma(\chi_{c0}(1P) \to K^+K^-K^0_SK^0_S)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c0}(1P))] = (0.138 \pm 0.039 \pm 0.025) \times 10^{-3}$ which we divide by our best value $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.68 \pm 0.31) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

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

VALUE (units 10^{-3})	DOCUMENT ID
2.79±0.29 OUR FIT	

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

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
0.98±0.25±0.03	38	[58] ABLIKIM	06T	BES2	$\psi(2S) \to \gamma 2K^+ 2K^-$

[58] ABLIKIM 06T reports $(1.03 \pm 0.22 \pm 0.15) \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \to K^+K^-\phi)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.2 \pm 0.4) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.68 \pm 0.31) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\phi\phi)/\Gamma_{total}$ Γ_{47}/Γ

VALUE (units 10^{-3})	DOCUMENT ID
0.91±0.19 OUR FIT	

$\Gamma(p\overline{p})/\Gamma_{total}$ Γ_{48}/Γ

VALUE (units 10^{-4})	DOCUMENT ID
(2.23+-0.13) OUR FIT	

$\Gamma(p\overline{p}\pi^0)/\Gamma_{total}$ Γ_{49}/Γ

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
0.70±0.07 OUR AVERAGE	Error includes scale factor of 1.2.			
$0.74 \pm 0.06 \pm 0.02$	[59] ONYISI	10	CLE3	$\psi(2S) \to \gamma p\overline{p}X$
$0.56 \pm 0.12 \pm 0.02$	[60] ATHAR	07	CLEO	$\psi(2S) \to \gamma h^+ h^- h^0$

[59] ONYISI 10 reports $(7.76 \pm 0.37 \pm 0.51 \pm 0.39) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \to p\overline{p}\pi^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \to \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.68 \pm 0.31) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[60] ATHAR 07 reports $(0.59 \pm 0.10 \pm 0.08) \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \to p\overline{p}\pi^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \to \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.68 \pm 0.31) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

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

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
0.36±0.04 OUR AVERAGE				
0.36±0.04±0.01	[61] ONYISI	10	CLE3	$\psi(2S) \to \gamma p\overline{p}X$
0.37±0.11±0.01	[62] ATHAR	07	CLEO	$\psi(2S) \to \gamma h^+ h^- h^0$

[61] ONYISI 10 reports $(3.73 \pm 0.38 \pm 0.28 \pm 0.19) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \to p\overline{p}\eta)/\Gamma_{\text{total}}] \times [B(\psi(2S) \to \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.68 \pm 0.31) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[62] ATHAR 07 reports $(0.39 \pm 0.11 \pm 0.04) \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \to p\overline{p}\eta)/\Gamma_{\text{total}}] \times [B(\psi(2S) \to \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.68 \pm 0.31) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(p\overline{p}\omega)/\Gamma_{\text{total}}$ Γ_{51}/Γ

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
0.53±0.06±0.02	[63] ONYISI	10	CLE3	$\psi(2S) \to \gamma p\overline{p}X$

[63] ONYISI 10 reports $(5.57 \pm 0.48 \pm 0.42 \pm 0.14) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \to p\overline{p}\omega)/\Gamma_{\text{total}}] \times [B(\psi(2S) \to \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.68 \pm 0.31) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\pi^+\pi^- p\overline{p})/\Gamma_{\text{total}}$ Γ_{52}/Γ

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
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	[64] BAI	99B	BES	$\psi(2S) \to \gamma\chi_{c0}$
4.20±1.15±0.18	[64] TANENBAUM	78	MRK1	$\psi(2S) \to \gamma\chi_{c0}$

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

$\Gamma(\pi^0\pi^0 p\overline{p})/\Gamma_{total}$ Γ_{53}/Γ

VALUE (%)	EVTS	DOCUMENT ID		TECN	COMMENT
0.105±0.028±0.003	39.5	[65] HE	08B	CLEO	$e^+e^- \to \gamma h^+ h^- h^0 h^0$

[65] HE 08B reports 0.11 ± 0.02 ± 0.02 ± 0.01 % from a measurement of $[\Gamma(\chi_{c0}(1P) \to \pi^0\pi^0 p\overline{p})/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.68 \pm 0.31) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(K^0_S K^0_S p\overline{p})/\Gamma_{total}$ Γ_{54}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<8.8	90	[66] ABLIKIM	06D	BES2	$\psi(2S) \to \chi_{c0}\gamma$

[66] Using $B(\psi(2S) \to \chi_{c0}\gamma) = (9.2 \pm 0.5)\%$

$\Gamma(p\overline{n}\pi^-)/\Gamma_{total}$ Γ_{55}/Γ

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
11.4±3.1±0.4	[67] ABLIKIM	06I	BES2	$\psi(2S) \to \gamma p\pi^- X$

[67] ABLIKIM 06I reports $[\Gamma(\chi_{c0}(1P) \to p\overline{n}\pi^-)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c0}(1P))] = (1.10 \pm 0.24 \pm 0.18) \times 10^{-4}$ which we divide by our best value $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.68 \pm 0.31) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\Lambda\overline{\Lambda})/\Gamma_{total}$ Γ_{56}/Γ

VALUE (units 10^{-4})	DOCUMENT ID
(3.3+-0.4) OUR FIT	

$\Gamma(\Lambda\overline{\Lambda}\pi^+\pi^-)/\Gamma_{total}$ Γ_{57}/Γ

VALUE (units 10^{-3})	CL%	DOCUMENT ID		TECN	COMMENT
<4.0	90	[68] ABLIKIM	06D	BES2	$\psi(2S) \to \chi_{c0}\gamma$

[68] Using $B(\psi(2S) \to \chi_{c0}\gamma) = (9.2 \pm 0.5)\%$

$\Gamma(K^+\overline{p}\Lambda + \text{c.c.})/\Gamma_{total}$ Γ_{58}/Γ

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
1.02±0.19±0.03	[69] ATHAR	07	CLEO	$\psi(2S) \to \gamma h^+ h^- h^0$

[69] ATHAR 07 reports $(1.07 \pm 0.17 \pm 0.12) \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \to K^+\overline{p}\Lambda + \text{c.c.})/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.68 \pm 0.31) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\Sigma^0\overline{\Sigma}^0)/\Gamma_{total}$ Γ_{59}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
4.2±0.7±0.1	78 ± 10	[70] NAIK	08	CLEO	$\psi(2S) \to \gamma\Sigma^0\overline{\Sigma}^0$

[70] NAIK 08 reports $(4.41 \pm 0.56 \pm 0.47) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \to \Sigma^0\overline{\Sigma}^0)/\Gamma_{\text{total}}] \times [\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P))]$ assuming $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.68 \pm 0.31) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\Sigma^+\overline{\Sigma}^-)/\Gamma_{\text{total}}$ Γ_{60}/Γ

VALUE (units 10^{-4})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
3.1±0.7±0.1	39 ± 7	[71] NAIK	08	CLEO	$\psi(2S) \to \gamma\Sigma^+\overline{\Sigma}^-$

[71] NAIK 08 reports $(3.25 \pm 0.57 \pm 0.43) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \to \Sigma^+\overline{\Sigma}^-)/\Gamma_{\text{total}}] \times [\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P))]$ assuming $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.68 \pm 0.31) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

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

VALUE (units 10^{-4})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
3.2±0.8±0.1	23.3 ± 4.9	[72] NAIK	08	CLEO	$\psi(2S) \to \gamma\Xi^0\overline{\Xi}^0$

[72] NAIK 08 reports $(3.34 \pm 0.70 \pm 0.48) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \to \Xi^0\overline{\Xi}^0)/\Gamma_{\text{total}}] \times [\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P))]$ assuming $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.68 \pm 0.31) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\Xi^-\overline{\Xi}^+)/\Gamma_{\text{total}}$ Γ_{62}/Γ

VALUE (units 10^{-4})	*CL%*	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
4.9±0.7±0.2		95 ± 11	[73] NAIK	08	CLEO	$\psi(2S) \to \gamma\Xi^+\overline{\Xi}^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<10.3	90		[74] ABLIKIM	06D	BES2	$\psi(2S) \to \chi_{c0}\gamma$

[73] NAIK 08 reports $(5.14 \pm 0.60 \pm 0.47) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \to \Xi^-\overline{\Xi}^+)/\Gamma_{\text{total}}] \times [\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P))]$ assuming $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$, which we rescale to our best value $\text{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.68 \pm 0.31) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[74] Using $\text{B}(\psi(2S) \to \chi_{c0}\gamma) = (9.2 \pm 0.5)\%$

$\Gamma(p\overline{p})/\Gamma_{\text{total}} \times \Gamma(\pi\pi)/\Gamma_{\text{total}}$ $\Gamma_{48}/\Gamma \times \Gamma_{30}/\Gamma$

VALUE (units 10^{-7})	*DOCUMENT ID*		*TECN*	*COMMENT*
19.0±1.4 OUR FIT				
15.3±2.4±0.8	[75] ANDREOTTI	03	E835	$\overline{p}p \to \chi_{c0} \to \pi^0\pi^0$

[75] We have multiplied $\text{B}(p\overline{p})\cdot\text{B}(\pi^0\pi^0)$ measurement by 3 to obtain $\text{B}(p\overline{p})\cdot\text{B}(\pi\pi)$.

$\Gamma(p\overline{p})/\Gamma_{\text{total}} \times \Gamma(\pi^0\eta)/\Gamma_{\text{total}}$ $\Gamma_{48}/\Gamma \times \Gamma_{31}/\Gamma$

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

$\Gamma(p\overline{p})/\Gamma_{total} \times \Gamma(\pi^0\eta')/\Gamma_{total}$ $\Gamma_{48}/\Gamma \times \Gamma_{32}/\Gamma$

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

$\Gamma(p\overline{p})/\Gamma_{total} \times \Gamma(\eta\eta)/\Gamma_{total}$ $\Gamma_{48}/\Gamma \times \Gamma_{33}/\Gamma$

VALUE (units 10^{-7})	DOCUMENT ID		TECN	COMMENT
(6.8+-0.6) OUR FIT				
$4.0\pm1.2^{+0.5}_{-0.3}$	ANDREOTTI	05C	E835	$\overline{p}p \rightarrow \eta\eta$

$\Gamma(p\overline{p})/\Gamma_{total} \times \Gamma(\eta\eta')/\Gamma_{total}$ $\Gamma_{48}/\Gamma \times \Gamma_{34}/\Gamma$

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	$\overline{p}p \rightarrow \pi^0\eta$

RADIATIVE DECAYS

$\Gamma(\gamma J/\psi(1S))/\Gamma_{total}$ Γ_{63}/Γ

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
117± 8 OUR FIT				
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$200\pm20\pm20$	[76] ADAM	05A	CLEO	$e^+e^- \rightarrow \psi(2S) \rightarrow \gamma\chi_{c0}$

[76] 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.

$\Gamma(\gamma\rho^0)/\Gamma_{total}$ Γ_{64}/Γ

VALUE (units 10^{-6})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
<9	90	1.2 ± 4.5	[77] BENNETT	08A	CLEO	$\psi(2S) \rightarrow \gamma\gamma\rho^0$

[77] BENNETT 08A reports $< 9.6 \times 10^{-6}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow \gamma\rho^0)/\Gamma_{total}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.2 \pm 0.4) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = 9.68 \times 10^{-2}$.

$\Gamma(\gamma\omega)/\Gamma_{total}$ Γ_{65}/Γ

VALUE (units 10^{-6})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
<8	90	0.0 ± 2.8	[78] BENNETT	08A	CLEO	$\psi(2S) \rightarrow \gamma\gamma\omega$

[78] BENNETT 08A reports $< 8.8 \times 10^{-6}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow \gamma\omega)/\Gamma_{total}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.2 \pm 0.4) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = 9.68 \times 10^{-2}$.

$\Gamma(\gamma\phi)/\Gamma_{total}$ Γ_{66}/Γ

VALUE (units 10^{-6})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
<6	90	0.1 ± 1.6	[79] BENNETT	08A	CLEO	$\psi(2S) \rightarrow \gamma\gamma\phi$

[79] BENNETT 08A reports $< 6.4 \times 10^{-6}$ from a measurement of $[\Gamma(\chi_{c0}(1P) \rightarrow \gamma\phi)/\Gamma_{total}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = (9.2 \pm 0.4) \times 10^{-2}$, which we rescale to our best value $B(\psi(2S) \rightarrow \gamma\chi_{c0}(1P)) = 9.68 \times 10^{-2}$.

$\Gamma(\gamma\gamma)/\Gamma_{total}$ Γ_{67}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
(2.23+-0.17) OR FIT					

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

<8	90	[80] WICHT	08	BELL	$B^{\pm} \to K^{\pm}\gamma\gamma$

[80] WICHT 08 reports $[\Gamma(\chi_{c0}(1P) \to \gamma\gamma)/\Gamma_{total}] \times [B(B^+ \to \chi_{c0}(1P)K^+)] < 0.11 \times 10^{-6}$ which we divide by our best value $B(B^+ \to \chi_{c0}(1P)K^+) = 1.32 \times 10^{-4}$.

$\Gamma(\gamma\gamma)/\Gamma(\gamma J/\psi(1S))$ Γ_{67}/Γ_{63}

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
1.90±0.19 OR FIT				
2.0 ±0.4 OUR AVERAGE				
$2.2 \pm 0.4\ ^{+0.1}_{-0.2}$	[81] ANDREOTTI	04	E835	$p\overline{p} \to \chi_{c0} \to \gamma\gamma$
1.45±0.74	[82] AMBROGIANI	00B	E835	$\overline{p}p \to \chi_{c2} \to \gamma\gamma, \gamma J/\psi$

[81] The values of $B(p\overline{p})B(\gamma\gamma)$ 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.

[82] Calculated by us using $B(J/\psi(1S) \to e^+e^-) = 0.0593 \pm 0.0010$.

$\Gamma(p\overline{p})/\Gamma_{total} \times \Gamma(\gamma J/\psi(1S))/\Gamma_{total}$ $\Gamma_{48}/\Gamma \times \Gamma_{63}/\Gamma$

VALUE (units 10^{-7})	EVTS	DOCUMENT ID		TECN	COMMENT
26.2±1.7 OR FIT					
28.2±2.1 OR AVERAGE					
28.0±1.9±1.3	392	[83,84,85] BAGNASCO	02	E835	$\overline{p}p \to \chi_{c0} \to J/\psi\gamma$
$29.3^{+5.7}_{-4.7}\pm 1.5$	89	[83,84] AMBROGIANI	99B		$\overline{p}p \to \chi_{c0} \to J/\psi\gamma$

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

[84] Calculated by us using $B(J/\psi(1S) \to e^+e^-) = 0.0593 \pm 0.0010$.

[85] Recalculated by ANDREOTTI 05A.

$\Gamma(p\overline{p})/\Gamma_{total} \times \Gamma(\gamma\gamma)/\Gamma_{total}$ $\Gamma_{48}/\Gamma \times \Gamma_{67}/\Gamma$

VALUE (units 10^{-8})	DOCUMENT ID		TECN	COMMENT
(5.0+-0.5) OR FIT				

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

$6.52\pm 1.18^{+0.48}_{-0.72}$	[86] ANDREOTTI	04	E835	$p\overline{p} \to \chi_{c0} \to \gamma\gamma$

[86] The values of $B(p\overline{p})B(\gamma\gamma)$ 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

$\Gamma(\chi_{c0}(1P) \to p\overline{p})/\Gamma_{total} \times \Gamma(\psi(2S) \to \gamma\chi_{c0}(1P))/\Gamma_{total}$ $\Gamma_{48}/\Gamma \times \Gamma_{109}^{\psi(2S)}/\Gamma^{\psi(2S)}$

VALUE (units 10^{-6})	EVTS	DOCUMENT ID		TECN	COMMENT
21.6±1.4 OR FIT					
23.7±1.8 OR AVERAGE					
$23.7\pm 1.4\pm 1.4$	383 ± 22	[87] NAIK	08	CLEO	$\psi(2S) \to \gamma p\overline{p}$
$23.6^{+3.7}_{-3.4}\pm 3.4$	89.5^{+14}_{-13}	BAI	04F	BES	$\psi(2S) \to \gamma\chi_{c0}(1P) \to \gamma\overline{p}p$

[87] Calculated by us. NAIK 08 reports $B(\chi_c^0 \to p\overline{p}) = (25.7 \pm 1.5 \pm 1.5 \pm 1.3) \times 10^{-5}$ using $B(\psi(2S) \to \gamma\chi_c^0) = (9.22 \pm 0.11 \pm 0.46)\%$.

$\Gamma(\chi_{c0}(1P) \to p\overline{p})/\Gamma_{total} \times \Gamma(\psi(2S) \to \gamma\chi_{c0}(1P))/\Gamma(\psi(2S) \to J/\psi(1S)\pi^+\pi^-)$ $\Gamma_{48}/\Gamma \times \Gamma_{109}^{\psi(2S)}/\Gamma_{11}^{\psi(2S)}$

VALUE (units 10^{-5})	DOCUMENT ID		TECN	COMMENT
(6.4+-0.4) OUR FIT				
4.6±1.9	[88] BAI	98I	BES	$\psi(2S) \to \gamma\chi_{c0} \to \gamma\overline{p}p$

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

$\Gamma(\chi_{c0}(1P) \to \Lambda\overline{\Lambda})/\Gamma_{total} \times \Gamma(\psi(2S) \to \gamma\chi_{c0}(1P))/\Gamma_{total}$ $\Gamma_{56}/\Gamma \times \Gamma_{109}^{\psi(2S)}/\Gamma^{\psi(2S)}$

VALUE (units 10^{-6})	EVTS	DOCUMENT ID		TECN	COMMENT
32 ±4 OUR FIT					
31.2±3.3±2.0	131 ± 12	[89] NAIK	08	CLEO	$\psi(2S) \to \gamma\Lambda\overline{\Lambda}$

[89] Calculated by us. NAIK 08 reports $B(\chi_c^0 \to \Lambda\overline{\Lambda}) = (33.8 \pm 3.6 \pm 2.2 \pm 1.7) \times 10^{-5}$ using $B(\psi(2S) \to \gamma\chi_c^0) = (9.22 \pm 0.11 \pm 0.46)\%$.

$\Gamma(\chi_{c0}(1P) \to \Lambda\overline{\Lambda})/\Gamma_{total} \times \Gamma(\psi(2S) \to \gamma\chi_{c0}(1P))/\Gamma(\psi(2S) \to J/\psi(1S)\pi^+\pi^-)$ $\Gamma_{56}/\Gamma \times \Gamma_{109}^{\psi(2S)}/\Gamma_{11}^{\psi(2S)}$

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
(9.5+-1.1) OUR FIT					
$13.0^{+3.6}_{-3.5}$±2.5	$15.2^{+4.2}_{-4.0}$	[90] BAI	03E	BES	$\psi(2S) \to \gamma\Lambda\overline{\Lambda}$

[90] BAI 03E reports [$B(\chi_c^0 \to \Lambda\overline{\Lambda})\ B(\psi(2S) \to \gamma\chi_c^0)$ / $B(\psi(2S) \to J/\psi\pi^+\pi^-)$] × [$B^2(\Lambda \to \pi^- p)$ / $B(J/\psi \to p\overline{p})$] = $(2.45^{+0.68}_{-0.65} \pm 0.46)\%$. We calculate from this measurement the presented value using $B(\Lambda \to \pi^- p) = (63.9 \pm 0.5)\%$ and $B(J/\psi \to p\overline{p}) = (2.17 \pm 0.07) \times 10^{-3}$.

$\Gamma(\chi_{c0}(1P) \to \gamma J/\psi(1S))/\Gamma_{total} \times \Gamma(\psi(2S) \to \gamma\chi_{c0}(1P))/\Gamma_{total}$ $\Gamma_{63}/\Gamma \times \Gamma_{109}^{\psi(2S)}/\Gamma^{\psi(2S)}$

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
0.113±0.008 OUR FIT					
0.073±0.018 OUR AVERAGE					
0.069±0.018		[91] OREGLIA	82	CBAL	$\psi(2S) \to \gamma\chi_{c0}$
0.4 ±0.3		[92] BRANDELIK	79B	DASP	$\psi(2S) \to \gamma\chi_{c0}$
0.16 ±0.11		[92] BARTEL	78B	CNTR	$\psi(2S) \to \gamma\chi_{c0}$
3.3 ±1.7		[93] BIDDICK	77	CNTR	$e^+e^- \to \gamma X$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.125±0.007±0.013	560	[94] MENDEZ	08	CLEO	$\psi(2S) \to \gamma\chi_{c0}$
0.18 ±0.01 ±0.02	172	[95] ADAM	05A	CLEO	Repl. by MENDEZ 08

[91] Recalculated by us using $B(J/\psi(1S) \to \ell^+\ell^-) = 0.1181 \pm 0.0020$.
[92] Recalculated by us using $B(J/\psi(1S) \to \mu^+\mu^-) = 0.0588 \pm 0.0010$.
[93] Assumes isotropic gamma distribution.
[94] Not independent from other measurements of MENDEZ 08.
[95] Not independent from other values reported by ADAM 05A.

$\Gamma(\chi_{c0}(1P) \to \gamma J/\psi(1S))/\Gamma_{total} \times \Gamma(\psi(2S) \to \gamma\chi_{c0}(1P))/\Gamma(\psi(2S) \to J/\psi(1S)\text{anything})$ $\Gamma_{63}/\Gamma \times \Gamma_{109}^{\psi(2S)}/\Gamma_9^{\psi(2S)}$

$\Gamma_{63}/\Gamma \times \Gamma_{109}^{\psi(2S)}/\Gamma_9^{\psi(2S)} = \Gamma_{63}/\Gamma \times \Gamma_{109}^{\psi(2S)}/(\Gamma_{11}^{\psi(2S)} + \Gamma_{12}^{\psi(2S)} + \Gamma_{13}^{\psi(2S)} + 0.344\Gamma_{110}^{\psi(2S)} + 0.195\Gamma_{111}^{\psi(2S)})$

VALUE (units 10^{-2})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
0.191±0.014 OUR FIT					
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.201±0.011±0.021	560	[96] MENDEZ	08	CLEO	$\psi(2S) \to \gamma\chi_{c0}$
0.31 ±0.02 ±0.03	172	ADAM	05A	CLEO	Repl. by MENDEZ 08

[96] Not independent from other measurements of MENDEZ 08.

$\Gamma(\chi_{c0}(1P) \to \gamma J/\psi(1S))/\Gamma_{total} \times \Gamma(\psi(2S) \to \gamma\chi_{c0}(1P))/\Gamma(\psi(2S) \to J/\psi(1S)\pi^+\pi^-)$ $\Gamma_{63}/\Gamma \times \Gamma_{109}^{\psi(2S)}/\Gamma_{11}^{\psi(2S)}$

VALUE (units 10^{-2})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
0.338±0.024 OUR FIT					
0.358±0.020±0.037	560	MENDEZ	08	CLEO	$\psi(2S) \to \gamma\chi_{c0}$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.55 ±0.04 ±0.06	172	[97] ADAM	05A	CLEO	Repl. by MENDEZ 08

[97] Not independent from other values reported by ADAM 05A.

$\Gamma(\chi_{c0}(1P) \to \gamma\gamma)/\Gamma_{total} \times \Gamma(\psi(2S) \to \gamma\chi_{c0}(1P))/\Gamma_{total}$ $\Gamma_{67}/\Gamma \times \Gamma_{109}^{\psi(2S)}/\Gamma^{\psi(2S)}$

VALUE (units 10^{-5})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
(2.16+-0.19) OUR FIT					
(2.21+-0.33) OUR AVERAGE					
2.17±0.32±0.10	207 ± 31	ECKLUND	08A	CLEO	$\psi(2S) \to \gamma\chi_{c0} \to 3\gamma$
3.7 ±1.8 ±1.0		LEE	85	CBAL	$\psi(2S) \to \gamma\chi_{c0}$

$\Gamma(\chi_{c0}(1P) \to \pi\pi)/\Gamma_{total} \times \Gamma(\psi(2S) \to \gamma\chi_{c0}(1P))/\Gamma_{total}$ $\Gamma_{30}/\Gamma \times \Gamma_{109}^{\psi(2S)}/\Gamma^{\psi(2S)}$

VALUE (units 10^{-4})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
(8.25+-0.29) OUR FIT					
(8.80+-0.34) OUR AVERAGE					
9.11±0.08±0.65	17k	[98] ABLIKIM	10A	BES3	$e^+e^- \to \psi(2S) \to \gamma\chi_{c0}$
8.81±0.11±0.43	8.9k	[99] ASNER	09	CLEO	$\psi(2S) \to \gamma\pi^+\pi^-$
8.13±0.19±0.89	2.8k	[100] ASNER	09	CLEO	$\psi(2S) \to \gamma\pi^0\pi^0$

[98] Calculated by us. ABLIKIM 10A reports $B(\chi_{c0} \to \pi^0\pi^0) = (3.23 \pm 0.03 \pm 0.23 \pm 0.14) \times 10^{-3}$ using $B(\psi(2S) \to \gamma\chi_{c0}) = (9.4 \pm 0.4)\%$. We have multiplied the $\pi^0\pi^0$ measurement by 3 to obtain $\pi\pi$.

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

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

$\Gamma(\chi_{c0}(1P) \to \pi\pi)/\Gamma_{total} \times \Gamma(\psi(2S) \to \gamma\chi_{c0}(1P))/\Gamma(\psi(2S) \to J/\psi(1S)\pi^+\pi^-)$ $\Gamma_{30}/\Gamma \times \Gamma_{109}^{\psi(2S)}/\Gamma_{11}^{\psi(2S)}$

VALUE (units 10^{-4})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
24.5±0.9 OUR FIT					
20.7±1.7 OUR AVERAGE					
$23.9 \pm 2.7 \pm 4.1$	97 ± 11	[101] BAI	03C	BES	$\psi(2S) \to \gamma\chi_{c0} \to \gamma\pi^0\pi^0$
$20.2 \pm 1.1 \pm 1.5$	720 ± 32	[102] BAI	98I	BES	$\psi(2S) \to \gamma\chi_{c0} \to \gamma\pi^+\pi^-$

[101] We have multiplied $\pi^0\pi^0$ measurement by 3 to obtain $\pi\pi$.

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

$\Gamma(\chi_{c0}(1P) \to \eta\eta)/\Gamma_{total} \times \Gamma(\psi(2S) \to \gamma\chi_{c0}(1P))/\Gamma_{total}$ $\Gamma_{33}/\Gamma \times \Gamma_{109}^{\psi(2S)}/\Gamma^{\psi(2S)}$

VALUE (units 10^{-4})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
(2.93+-0.18) OUR FIT					
(3.12+-0.19) OUR AVERAGE					
$3.23 \pm 0.09 \pm 0.23$	2132	[103] ABLIKIM	10A	BES3	$e^+e^- \to \psi(2S) \to \gamma\chi_{c0}$
$2.93 \pm 0.12 \pm 0.29$	0.9k	[104] ASNER	09	CLEO	$\psi(2S) \to \gamma\eta\eta$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$2.86 \pm 0.46 \pm 0.37$	48	[105] ADAMS	07	CLEO	$\psi(2S) \to \gamma\chi_{c0}$

[103] Calculated by us. ABLIKIM 10A reports $B(\chi_{c0} \to \eta\eta) = (3.44 \pm 0.10 \pm 0.24 \pm 0.13) \times 10^{-3}$ using $B(\psi(2S) \to \gamma\chi_{c0}) = (9.4 \pm 0.4)\%$.

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

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

$\Gamma(\chi_{c0}(1P) \to \eta\eta)/\Gamma_{total} \times \Gamma(\psi(2S) \to \gamma\chi_{c0}(1P))/\Gamma(\psi(2S) \to J/\psi(1S)\pi^+\pi^-)$ $\Gamma_{33}/\Gamma \times \Gamma_{109}^{\psi(2S)}/\Gamma_{11}^{\psi(2S)}$

VALUE (units 10^{-3})	*DOCUMENT ID*		*TECN*	*COMMENT*
0.87 ±0.05 OUR FIT				
0.578±0.241±0.158	BAI	03C	BES	$\psi(2S) \to \gamma\eta\eta$

$\Gamma(\chi_{c0}(1P) \to K^+K^-)/\Gamma_{\text{total}} \times \Gamma(\psi(2S) \to \gamma\chi_{c0}(1P))/\Gamma_{\text{total}}$ $\Gamma_{37}/\Gamma \times \Gamma_{109}^{\psi(2S)}/\Gamma^{\psi(2S)}$

VALUE (units 10^{-4})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
(5.87+-0.28) OR FIT					
5.97±0.07±0.32	8.1k	[106] ASNER	09	CLEO	$\psi(2S) \to \gamma K^+K^-$

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

$\Gamma(\chi_{c0}(1P) \to K^+K^-)/\Gamma_{\text{total}} \times \Gamma(\psi(2S) \to \gamma\chi_{c0}(1P))/\Gamma(\psi(2S) \to J/\psi(1S)\pi^+\pi^-)$ $\Gamma_{37}/\Gamma \times \Gamma_{109}^{\psi(2S)}/\Gamma_{11}^{\psi(2S)}$

VALUE (units 10^{-3})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
1.75±0.09 OR FIT					
1.63±0.10±0.15	774 ± 38	[107] BAI	98I	BES	$\psi(2S) \to \gamma K^+K^-$

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

$\Gamma(\chi_{c0}(1P) \to K^0_S K^0_S)/\Gamma_{\text{total}} \times \Gamma(\psi(2S) \to \gamma\chi_{c0}(1P))/\Gamma_{\text{total}}$ $\Gamma_{38}/\Gamma \times \Gamma_{109}^{\psi(2S)}/\Gamma^{\psi(2S)}$

VALUE (units 10^{-4})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
(3.04+-0.15) OR FIT					
(3.18+-0.17) OR AVERAGE					
3.22±0.07±0.17	2.1k	[108] ASNER	09	CLEO	$\psi(2S) \to \gamma K^0_S K^0_S$
3.02±0.19±0.33	322	ABLIKIM	05O	BES2	$\psi(2S) \to \gamma K^0_S K^0_S$

[108] Calculated by us. ASNER 09 reports $B(\chi_{c0} \to K^0_S K^0_S) = (3.49 \pm 0.08 \pm 0.18 \pm 0.17) \times 10^{-3}$ using $B(\psi(2S) \to \gamma\chi_{c0}) = (9.22 \pm 0.11 \pm 0.46)\%$.

$\Gamma(\chi_{c0}(1P) \to K^0_S K^0_S)/\Gamma_{\text{total}} \times \Gamma(\psi(2S) \to \gamma\chi_{c0}(1P))/\Gamma(\psi(2S) \to J/\psi(1S)\pi^+\pi^-)$ $\Gamma_{38}/\Gamma \times \Gamma_{109}^{\psi(2S)}/\Gamma_{11}^{\psi(2S)}$

VALUE (units 10^{-4})	*DOCUMENT ID*		*TECN*	*COMMENT*
(9.1+-0.5) OR FIT				
5.6±0.8±1.3	[109] BAI	99B	BES	$\psi(2S) \to \gamma K^0_S K^0_S$

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

$\Gamma(\chi_{c0}(1P) \to 2(\pi^+\pi^-))/\Gamma_{\text{total}} \times \Gamma(\psi(2S) \to \gamma\chi_{c0}(1P))/\Gamma(\psi(2S) \to J/\psi(1S)\pi^+\pi^-)$ $\Gamma_1/\Gamma \times \Gamma_{109}^{\psi(2S)}/\Gamma_{11}^{\psi(2S)}$

VALUE (units 10^{-3})	*DOCUMENT ID*		*TECN*	*COMMENT*
6.5±0.5 OR FIT				
6.9±2.4 OR AVERAGE Error includes scale factor of 3.8.				
4.4±0.1±0.9	[110] BAI	99B	BES	$\psi(2S) \to \gamma\chi_{c0}$
9.3±0.9	[111] TANENBAUM	78	MRK1	$\psi(2S) \to \gamma\chi_{c0}$

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

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

$\Gamma(\chi_{c0}(1P) \to \pi^+\pi^- K^+ K^-)/\Gamma_{total} \times \Gamma(\psi(2S) \to \gamma\chi_{c0}(1P))/\Gamma_{total}$ $\Gamma_8/\Gamma \times \Gamma_{109}^{\psi(2S)}/\Gamma^{\psi(2S)}$

VALUE (units 10^{-3})	*DOCUMENT ID*		*TECN*	*COMMENT*
1.73±0.14 OUR FIT				
1.64±0.05±0.2	ABLIKIM	05Q	BES2	$\psi(2S) \to \gamma\chi_{c0}$

$\Gamma(\chi_{c0}(1P) \to \pi^+\pi^- K^+ K^-)/\Gamma_{total} \times \Gamma(\psi(2S) \to \gamma\chi_{c0}(1P))/\Gamma(\psi(2S) \to J/\psi(1S)\pi^+\pi^-)$ $\Gamma_8/\Gamma \times \Gamma_{109}^{\psi(2S)}/\Gamma_{11}^{\psi(2S)}$

VALUE (units 10^{-3})	*DOCUMENT ID*		*TECN*	*COMMENT*
5.2 ±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	$\psi(2S) \to \gamma\chi_{c0}$
7.4 ±1.0	[112] TANENBAUM	78	MRK1	$\psi(2S) \to \gamma\chi_{c0}$

[112] The reported value is derived using B($\psi(2S) \to \pi^+\pi^- J/\psi$) × B($J/\psi \to \ell^+\ell^-$) = (4.6 ± 0.7)%. Calculated by us using B($J/\psi \to \ell^+\ell^-$) = 0.1181 ± 0.0020.

$\Gamma(\chi_{c0}(1P) \to K^+ K^- K^+ K^-)/\Gamma_{total} \times \Gamma(\psi(2S) \to \gamma\chi_{c0}(1P))/\Gamma_{total}$ $\Gamma_{45}/\Gamma \times \Gamma_{109}^{\psi(2S)}/\Gamma^{\psi(2S)}$

VALUE (units 10^{-4})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
(2.70+-0.27) OUR FIT					
3.20±0.11±0.41	278	[113] ABLIKIM	06T	BES2	$\psi(2S) \to \gamma 2K^+ 2K^-$

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

$\Gamma(\chi_{c0}(1P) \to K^+ K^- K^+ K^-)/\Gamma_{total} \times \Gamma(\psi(2S) \to \gamma\chi_{c0}(1P))/\Gamma(\psi(2S) \to J/\psi(1S)\pi^+\pi^-)$ $\Gamma_{45}/\Gamma \times \Gamma_{109}^{\psi(2S)}/\Gamma_{11}^{\psi(2S)}$

VALUE (units 10^{-4})	*DOCUMENT ID*		*TECN*	*COMMENT*
(8.0+-0.8) OUR FIT				
6.1±0.8±0.9	[114] BAI	99B	BES	$\psi(2S) \to \gamma 2K^+ 2K^-$

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

$\Gamma(\chi_{c0}(1P) \to \phi\phi)/\Gamma_{total} \times \Gamma(\psi(2S) \to \gamma\chi_{c0}(1P))/\Gamma_{total}$ $\Gamma_{47}/\Gamma \times \Gamma_{109}^{\psi(2S)}/\Gamma^{\psi(2S)}$

VALUE (units 10^{-4})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
0.88±0.18 OUR FIT					
0.86±0.19±0.12	26	[115] ABLIKIM	06T	BES2	$\psi(2S) \to \gamma 2K^+ 2K^-$

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

$\Gamma(\chi_{c0}(1P) \to \phi\phi)/\Gamma_{\text{total}} \times \Gamma(\psi(2S) \to \gamma\chi_{c0}(1P))/\Gamma(\psi(2S) \to J/\psi(1S)\pi^+\pi^-)$ $\Gamma_{47}/\Gamma \times \Gamma_{109}^{\psi(2S)}/\Gamma_{11}^{\psi(2S)}$

VALUE (units 10^{-4})	*DOCUMENT ID*	*TECN*	*COMMENT*
(2.6+-0.5) OUR FIT			
2.6±1.0±1.1	[116] BAI	99B BES	$\psi(2S) \to \gamma 2K^+ 2K^-$

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

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