$\chi_{c0}(1P)$

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

$\chi_{c0}(1P)$ 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
10.2±0.7 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 $^{+1.5}_{-1.6}$ $^{+0.9}_{-1.1}$		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	$2(\pi^+\pi^-)$	(2.23 ± 0.20) %	
Γ_2	$\rho\rho$		
Γ_3	$f_0(980)f_0(980)$	$(6.9\pm2.2)\times10^{-4}$	
Γ_4	$\pi^+\pi^-K^+K^-$	(1.79 ± 0.16) %	
Γ_5	$f_0(980)f_0(980)$	$(1.7^{+1.1}_{-0.9})\times10^{-4}$	
Γ_6	$f_0(980)f_0(2200)$	$(8.3^{+2.1}_{-2.6})\times10^{-4}$	
Γ_7	$f_0(1370)f_0(1370)$	$<2.8\times10^{-4}$	CL=90%
Γ_8	$f_0(1370)f_0(1500)$	$<1.8\times10^{-4}$	CL=90%
Γ_9	$f_0(1370)f_0(1710)$	$(7.0^{+3.7}_{-2.4})\times10^{-4}$	
Γ_{10}	$f_0(1500)f_0(1370)$	$<1.4\times10^{-4}$	CL=90%
Γ_{11}	$f_0(1500)f_0(1500)$	$<5\times10^{-5}$	CL=90%
Γ_{12}	$f_0(1500)f_0(1710)$	$<7\times10^{-5}$	CL=90%
Γ_{13}	$\rho^0\pi^+\pi^-$	$(8.7\pm2.8)\times10^{-3}$	
Γ_{14}	$3(\pi^+\pi^-)$	(1.20 ± 0.18) %	
Γ_{15}	$K^+\overline{K}^*(892)^0\pi^-+$ c.c.	$(7.2\pm1.6)\times10^{-3}$	
Γ_{16}	$K_1(1270)^+K^-+$ c.c. $\rightarrow \pi^+\pi^-K^+K^-$	$(6.5\pm2.0)\times10^{-3}$	
Γ_{17}	$K_1(1400)^+K^-+$ c.c. $\rightarrow \pi^+\pi^-K^+K^-$	$<2.8\times10^{-3}$	CL=90%
Γ_{18}	$K^*(892)^0\overline{K}^*(892)^0$	$(1.8\pm0.6)\times10^{-3}$	
Γ_{19}	$K_0^*(1430)^0\overline{K}_0^*(1430)^0 \rightarrow \pi^+\pi^-K^+K^-$	$(1.02^{+0.38}_{-0.30})\times10^{-3}$	
Γ_{20}	$K_0^*(1430)^0\overline{K}_2^*(1430)^0+$ c.c. $\rightarrow \pi^+\pi^-K^+K^-$	$(8.3^{+2.1}_{-2.5})\times10^{-4}$	
Γ_{21}	$\pi\pi$	$(7.3\pm0.6)\times10^{-3}$	
Γ_{22}	$\pi^0\eta$		
Γ_{23}	$\pi^0\eta'$		
Γ_{24}	$\eta\eta$	$(2.4\pm0.4)\times10^{-3}$	
Γ_{25}	$\eta\pi^+\pi^-$	$<1.1\times10^{-3}$	CL=90%
Γ_{26}	$\eta\eta'$	$<5\times10^{-4}$	CL=90%
Γ_{27}	$\eta'\eta'$	$(1.7\pm0.4)\times10^{-3}$	
Γ_{28}	$\omega\omega$	$(2.3\pm0.7)\times10^{-3}$	
Γ_{29}	K^+K^-	$(5.7\pm0.6)\times10^{-3}$	
Γ_{30}	$K_S^0K_S^0$	$(2.82\pm0.28)\times10^{-3}$	
Γ_{31}	$\pi^+\pi^-\eta$	$<2.1\times10^{-4}$	
Γ_{32}	$\pi^+\pi^-\eta'$	$<4\times10^{-4}$	
Γ_{33}	$\overline{K}^0K^+\pi^-+$ c.c.	$<9.8\times10^{-5}$	
Γ_{34}	$K^+K^-\pi^0$	$<6\times10^{-5}$	
Γ_{35}	$K^+K^-\eta$	$<2.4\times10^{-4}$	
Γ_{36}	$K^+K^-K_S^0K_S^0$	$(1.5\pm0.5)\times10^{-3}$	
Γ_{37}	$K^+K^-K^+K^-$	$(2.81\pm0.30)\times10^{-3}$	

Γ_{38}	$K^+K^-\phi$	$(1.01\pm0.26)\times10^{-3}$	
Γ_{39}	$K^0_S K^0_S \pi^+\pi^-$	$(5.9\ \pm1.1\ )\times10^{-3}$	
Γ_{40}	$\phi\phi$	$(9.3\ \pm2.0\ )\times10^{-4}$	
Γ_{41}	$p\overline{p}$	$(2.15\pm0.19)\times10^{-4}$	
Γ_{42}	$p\overline{p}\pi^0$	$(5.8\ \pm1.2\ )\times10^{-4}$	
Γ_{43}	$p\overline{p}\eta$	$(3.8\ \pm1.1\ )\times10^{-4}$	
Γ_{44}	$\pi^+\pi^- p\overline{p}$	$(2.1\ \pm0.7\ )\times10^{-3}$	S=1.4
Γ_{45}	$K^0_S K^0_S p\overline{p}$	$< 8.8\ \times10^{-4}$	CL=90%
Γ_{46}	$p\overline{n}\pi^-$	$(1.17\pm0.32)\times10^{-3}$	
Γ_{47}	$\Lambda\overline{\Lambda}$	$(4.4\ \pm1.5\ )\times10^{-4}$	
Γ_{48}	$\Lambda\overline{\Lambda}\pi^+\pi^-$	$< 4.0\ \times10^{-3}$	CL=90%
Γ_{49}	$K^+\overline{p}\Lambda+$ c.c.	$(1.05\pm0.20)\times10^{-3}$	
Γ_{50}	$\Xi^-\overline{\Xi}^+$	$< 1.03\ \times10^{-3}$	CL=90%

Radiative decays

Γ_{51}	$\gamma J/\psi(1S)$	(1.28 ± 0.11) %	
Γ_{52}	$\gamma\gamma$	$(2.35\pm0.23)\times10^{-4}$	

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

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

$\Gamma(p\overline{p}) \times \Gamma(\gamma J/\psi(1S))/\Gamma_{\text{total}}$ — $\Gamma_{41}\Gamma_{51}/\Gamma$

VALUE (eV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
28.0± 2.7 OUR FIT					
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$26.6\pm\ 2.6\pm1.4$	392	[6,7] BAGNASCO	02	E835	$\overline{p}p\to\chi_{c0}\to J/\psi\gamma$
$48.7^{+11.3}_{-\ 8.9}\pm2.4$		[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 ± 0.0010.

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

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

$\Gamma(\pi\pi) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ — $\Gamma_{21}\Gamma_{52}/\Gamma$

VALUE (eV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
17.6±2.0 OUR FIT					
22.7±3.2±3.5	129 ± 18	[8] NAKAZAWA	05	BELL	$e^+e^-\to e^+e^-\chi_{c0}$

$\Gamma(K^+K^-) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ — $\Gamma_{29}\Gamma_{52}/\Gamma$

VALUE (eV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
13.8±1.5 OUR FIT					
14.3±1.6±2.3	153 ± 17	NAKAZAWA	05	BELL	$e^+e^-\to e^+e^-\chi_{c0}$

$\Gamma(K^0_S K^0_S) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ — $\Gamma_{30}\Gamma_{52}/\Gamma$

VALUE (eV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
6.8 ±0.8 OUR FIT					
7.00±0.65±0.71	134 ± 12	CHEN	07B	BELL	$e^+e^-\to e^+e^-\chi_{c0}$

$\Gamma(2(\pi^+\pi^-)) \times \Gamma(\gamma\gamma)/\Gamma_{total}$ — $\Gamma_1\Gamma_{52}/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID		TECN	COMMENT
53 ± 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	$e^+e^- \to e^+e^-\chi_{c0}$

$\Gamma(\rho\rho) \times \Gamma(\gamma\gamma)/\Gamma_{total}$ — $\Gamma_2\Gamma_{52}/\Gamma$

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	$\gamma\gamma \to \chi_{c0} \to 2(\pi^+\pi^-)$

$\Gamma(\pi^+\pi^-K^+K^-) \times \Gamma(\gamma\gamma)/\Gamma_{total}$ — $\Gamma_4\Gamma_{52}/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID		TECN	COMMENT
43 ±4 OUR FIT					
38.8±3.7±4.7	1.7k	UEHARA	08	BELL	$\gamma\gamma \to \chi_{c0} \to K^+K^-\pi^+\pi^-$

$\Gamma(K^+\overline{K}^*(892)^0\pi^- + c.c.) \times \Gamma(\gamma\gamma)/\Gamma_{total}$ — $\Gamma_{15}\Gamma_{52}/\Gamma$

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

$\Gamma(K^*(892)^0\overline{K}^*(892)^0) \times \Gamma(\gamma\gamma)/\Gamma_{total}$ — $\Gamma_{18}\Gamma_{52}/\Gamma$

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	$\gamma\gamma \to \chi_{c0} \to K^+K^-\pi^+\pi^-$

$\Gamma(K^+K^-K^+K^-) \times \Gamma(\gamma\gamma)/\Gamma_{total}$ — $\Gamma_{37}\Gamma_{52}/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID		TECN	COMMENT
6.7±0.8 OUR FIT					
7.9±1.3±1.1	215 ± 36	UEHARA	08	BELL	$\gamma\gamma \to \chi_{c0} \to 2(K^+K^-)$

$\Gamma(\phi\phi) \times \Gamma(\gamma\gamma)/\Gamma_{total}$ — $\Gamma_{40}\Gamma_{52}/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID		TECN	COMMENT
2.2±0.5 OUR FIT					
2.3±0.9±0.4	23.6 ± 9.6	UEHARA	08	BELL	$\gamma\gamma \to \chi_{c0} \to 2(K^+K^-)$

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

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

HADRONIC DECAYS

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

VALUE	DOCUMENT ID
0.0223±0.0020 OUR FIT	

$\Gamma(\rho^0\pi^+\pi^-)/\Gamma(2(\pi^+\pi^-))$ — Γ_{13}/Γ_1

VALUE	DOCUMENT ID		TECN	COMMENT
0.39±0.14 OUR FIT				
0.39±0.12	TANENBAUM	78	MRK1	$\psi(2S) \to \gamma\chi_{c0}$

$\Gamma(\rho^0\pi^+\pi^-)/\Gamma_{total}$ — Γ_{13}/Γ

VALUE	DOCUMENT ID
0.0087±0.0028 OUR FIT	

$\Gamma(f_0(980)f_0(980))/\Gamma_{total}$ — Γ_3/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
6.9±2.2±0.3	36 ± 9	[9] ABLIKIM	04G	BES	$\psi(2S) \to \gamma 2\pi^+ 2\pi^-$

$\Gamma(\pi^+\pi^- K^+ K^-)/\Gamma_{total}$ — Γ_4/Γ

VALUE (units 10^{-3})	DOCUMENT ID
17.9±1.6 OUR FIT	

$\Gamma(K^+\overline{K}^*(892)^0\pi^- + c.c.)/\Gamma(\pi^+\pi^- K^+ K^-)$ — Γ_{15}/Γ_4

VALUE	DOCUMENT ID		TECN	COMMENT
0.40±0.11 OUR FIT				
0.41±0.10	TANENBAUM	78	MRK1	$\psi(2S) \to \gamma\chi_{c0}$

$\Gamma(K^+\overline{K}^*(892)^0\pi^- + c.c.)/\Gamma_{total}$ — Γ_{15}/Γ

VALUE	DOCUMENT ID
0.0072±0.0016 OUR FIT	

$\Gamma(f_0(980)f_0(980))/\Gamma_{total}$ — Γ_5/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
$\mathbf{17^{+11}_{-9}\pm1}$	28	[10] ABLIKIM	05Q	BES2	$\psi(2S) \to \gamma\pi^+\pi^- K^+ K^-$

$\Gamma(f_0(980)f_0(2200))/\Gamma_{total}$ — Γ_6/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
$\mathbf{8.3^{+2.1}_{-2.6}\pm0.4}$	77	[11] ABLIKIM	05Q	BES2	$\psi(2S) \to \gamma\pi^+\pi^- K^+ K^-$

$\Gamma(f_0(1370)f_0(1370))/\Gamma_{total}$ — Γ_7/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<2.8	90	[12] ABLIKIM	05Q	BES2	$\psi(2S) \to \gamma\pi^+\pi^- K^+ K^-$

$\Gamma(f_0(1370)f_0(1500))/\Gamma_{total}$ — Γ_8/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<1.8	90	[13] ABLIKIM	05Q	BES2	$\psi(2S) \to \gamma\pi^+\pi^- K^+ K^-$

$\Gamma(f_0(1370)f_0(1710))/\Gamma_{total}$ — Γ_9/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
$\mathbf{7.0^{+3.7}_{-2.4}\pm0.3}$	61	[14] ABLIKIM	05Q	BES2	$\psi(2S) \to \gamma\pi^+\pi^- K^+ K^-$

$\Gamma(f_0(1500)f_0(1370))/\Gamma_{total}$ — Γ_{10}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<1.4	90	[15] ABLIKIM	05Q	BES2	$\psi(2S) \to \gamma\pi^+\pi^- K^+ K^-$

$\Gamma(f_0(1500) f_0(1500))/\Gamma_{total}$ — Γ_{11}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<0.5	90	[16] ABLIKIM	05Q	BES2	$\psi(2S) \to \gamma \pi^+ \pi^- K^+ K^-$

$\Gamma(f_0(1500) f_0(1710))/\Gamma_{total}$ — Γ_{12}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<0.7	90	[17] ABLIKIM	05Q	BES2	$\psi(2S) \to \gamma \pi^+ \pi^- K^+ K^-$

$\Gamma(3(\pi^+ \pi^-))/\Gamma_{total}$ — Γ_{14}/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	[18] BAI	99B	BES	$\psi(2S) \to \gamma \chi_{c0}$
12.5±2.9±0.5	[18] TANENBAUM	78	MRK1	$\psi(2S) \to \gamma \chi_{c0}$

$\Gamma(K_1(1270)^+ K^- + \text{c.c.} \to \pi^+ \pi^- K^+ K^-)/\Gamma_{total}$ — Γ_{16}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
$6.5^{+2.0}_{-1.9}$±0.3	68	[19] ABLIKIM	05Q	BES2	$\psi(2S) \to \gamma \pi^+ \pi^- K^+ K^-$

$\Gamma(K_1(1400)^+ K^- + \text{c.c.} \to \pi^+ \pi^- K^+ K^-)/\Gamma_{total}$ — Γ_{17}/Γ

VALUE (units 10^{-3})	CL%	DOCUMENT ID		TECN	COMMENT
<2.8	90	[20] ABLIKIM	05Q	BES2	$\psi(2S) \to \gamma \pi^+ \pi^- K^+ K^-$

$\Gamma(K^*(892)^0 \overline{K}^*(892)^0)/\Gamma_{total}$ — Γ_{18}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
1.8±0.6±0.1	64	[21] 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	[22,23] ABLIKIM	04H	BES	Repl. by ABLIKIM 05Q

$\Gamma(K_0^*(1430)^0 \overline{K}_0^*(1430)^0 \to \pi^+ \pi^- K^+ K^-)/\Gamma_{total}$ — Γ_{19}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
$10.2^{+3.8}_{-2.9}$±0.4	83	[24] ABLIKIM	05Q	BES2	$\psi(2S) \to \gamma \pi^+ \pi^- K^+ K^-$

$\Gamma(K_0^*(1430)^0 \overline{K}_2^*(1430)^0 + \text{c.c.} \to \pi^+ \pi^- K^+ K^-)/\Gamma_{total}$ — Γ_{20}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
$8.3^{+2.0}_{-2.5}$±0.4	62	[25] ABLIKIM	05Q	BES2	$\psi(2S) \to \gamma \pi^+ \pi^- K^+ K^-$

$\Gamma(\pi \pi)/\Gamma_{total}$ — Γ_{21}/Γ

VALUE (units 10^{-3})	DOCUMENT ID
7.3±0.6 OUR FIT	

$\Gamma(\eta\eta)/\Gamma_{total}$ Γ_{24}/Γ

VALUE (units 10^{-3})	*DOCUMENT ID*
2.4±0.4 OUR FIT	

$\Gamma(\eta\eta)/\Gamma(\pi\pi)$ Γ_{24}/Γ_{21}

VALUE	*DOCUMENT ID*		*TECN*	*COMMENT*
0.32±0.07 OUR FIT				
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.26\pm0.09^{+0.03}_{-0.02}$	[26] ANDREOTTI	05C	E835	$\overline{p}p \rightarrow$ 2 mesons
$0.24\pm0.10\pm0.08$	[26] BAI	03C	BES	$\psi(2S) \rightarrow 5\gamma$

$\Gamma(\eta\pi^+\pi^-)/\Gamma_{total}$ Γ_{25}/Γ

VALUE (units 10^{-3})	*CL%*	*DOCUMENT ID*		*TECN*	*COMMENT*
<1.1	90	[27] ABLIKIM	06R	BES2	$\psi(2S) \rightarrow \gamma\chi_{c0}$

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

VALUE (units 10^{-3})	*CL%*	*DOCUMENT ID*		*TECN*	*COMMENT*
<0.5	90	[28] ADAMS	07	CLEO	$\psi(2S) \rightarrow \gamma\chi_{c0}$

$\Gamma(\eta'\eta')/\Gamma_{total}$ Γ_{27}/Γ

VALUE (units 10^{-3})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
1.7±0.4±0.1	23	[29] ADAMS	07	CLEO	$\psi(2S) \rightarrow \gamma\chi_{c0}$

$\Gamma(\omega\omega)/\Gamma_{total}$ Γ_{28}/Γ

VALUE (units 10^{-3})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
2.3±0.7±0.1	38.1 ± 9.6	[30] ABLIKIM	05N	BES2	$\psi(2S) \rightarrow \gamma\chi_{c0} \rightarrow \gamma 6\pi$

$\Gamma(K^+K^-)/\Gamma_{total}$ Γ_{29}/Γ

VALUE (units 10^{-3})	*DOCUMENT ID*
5.7±0.6 OUR FIT	

$\Gamma(K^0_S K^0_S)/\Gamma_{total}$ Γ_{30}/Γ

VALUE (units 10^{-3})	*DOCUMENT ID*
2.82±0.28 OUR FIT	

$\Gamma(K^0_S K^0_S)/\Gamma(\pi\pi)$ Γ_{30}/Γ_{21}

VALUE	*DOCUMENT ID*		*TECN*	*COMMENT*
0.38±0.05 OUR FIT				
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.31\pm0.05\pm0.05$	[31,32] CHEN	07B	BELL	$e^+e^- \rightarrow e^+e^-\chi_{c0}$

$\Gamma(K^0_S K^0_S)/\Gamma(K^+K^-)$ Γ_{30}/Γ_{29}

VALUE	*DOCUMENT ID*		*TECN*	*COMMENT*
0.49±0.08 OUR FIT				
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.49\pm0.07\pm0.08$	[32,33] CHEN	07B	BELL	$e^+e^- \rightarrow e^+e^-\chi_{c0}$

$\Gamma(\pi^+\pi^-\eta)/\Gamma_{total}$ — Γ_{31}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
<0.21	90	[34] ATHAR	07	CLEO	$\psi(2S) \to \gamma h^+ h^- h^0$

$\Gamma(\pi^+\pi^-\eta')/\Gamma_{total}$ — Γ_{32}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
<0.4	90	[35] ATHAR	07	CLEO	$\psi(2S) \to \gamma h^+ h^- h^0$

$\Gamma(\overline{K}^0 K^+\pi^- + c.c.)/\Gamma_{total}$ — Γ_{33}/Γ

VALUE (units 10^{-3})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
<0.10		90	[36] 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		[37,38] ABLIKIM	06R	BES2	$\psi(2S) \to \gamma\chi_{c0}$
<0.7	90		[18,38] BAI	99B	BES	$\psi(2S) \to \gamma\chi_{c0}$

$\Gamma(K^+K^-\pi^0)/\Gamma_{total}$ — Γ_{34}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
<0.06	90	[39] ATHAR	07	CLEO	$\psi(2S) \to \gamma h^+ h^- h^0$

$\Gamma(K^+K^-\eta)/\Gamma_{total}$ — Γ_{35}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
<0.24	90	[40] ATHAR	07	CLEO	$\psi(2S) \to \gamma h^+ h^- h^0$

$\Gamma(K^+K^-K^0_S K^0_S)/\Gamma_{total}$ — Γ_{36}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
1.5±0.5±0.1	16.8 ± 4.8	[41] ABLIKIM	05O	BES2	$\psi(2S) \to \gamma\chi_{c0}$

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

VALUE (units 10^{-3})	DOCUMENT ID
2.81±0.30 OUR FIT	

$\Gamma(K^+K^-\phi)/\Gamma_{total}$ — Γ_{38}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
1.01±0.26±0.04	38	[42] ABLIKIM	06T	BES2	$\psi(2S) \to \gamma 2K^+ 2K^-$

$\Gamma(K^0_S K^0_S \pi^+\pi^-)/\Gamma_{total}$ — Γ_{39}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
5.9±1.1±0.3	152 ± 14	[43] ABLIKIM	05O	BES2	$\psi(2S) \to \gamma\chi_{c0}$

$\Gamma(\phi\phi)/\Gamma_{total}$ — Γ_{40}/Γ

VALUE (units 10^{-3})	DOCUMENT ID
0.93±0.20 OUR FIT	

$\Gamma(p\overline{p})/\Gamma_{total}$ — Γ_{41}/Γ

VALUE (units 10^{-4})	DOCUMENT ID
2.15±0.19 OUR FIT	

$\Gamma(p\overline{p}\pi^0)/\Gamma_{total}$ — Γ_{42}/Γ

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
0.58±0.12±0.02	[44] ATHAR	07	CLEO	$\psi(2S) \rightarrow \gamma h^+ h^- h^0$

$\Gamma(p\overline{p}\eta)/\Gamma_{total}$ — Γ_{43}/Γ

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
0.38±0.11±0.02	[45] ATHAR	07	CLEO	$\psi(2S) \rightarrow \gamma h^+ h^- h^0$

$\Gamma(\pi^+\pi^- p\overline{p})/\Gamma_{total}$ — Γ_{44}/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	[18] BAI	99B	BES	$\psi(2S) \rightarrow \gamma \chi_{c0}$
4.20±1.15±0.18	[18] TANENBAUM	78	MRK1	$\psi(2S) \rightarrow \gamma \chi_{c0}$

$\Gamma(K^0_S K^0_S p\overline{p})/\Gamma_{total}$ — Γ_{45}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<8.8	90	[46] ABLIKIM	06D	BES2	$\psi(2S) \rightarrow \chi_{c0}\gamma$

$\Gamma(p\overline{n}\pi^-)/\Gamma_{total}$ — Γ_{46}/Γ

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
11.7±3.2±0.5	[47] ABLIKIM	06I	BES2	$\psi(2S) \rightarrow \gamma p \pi^- X$

$\Gamma(\Lambda\overline{\Lambda})/\Gamma_{total}$ — Γ_{47}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
4.4±1.2±0.9	$15.2^{+4.2}_{-4.0}$	[18] BAI	03E	BES	$\psi(2S) \rightarrow \gamma \chi_{c0} \rightarrow \gamma \Lambda\overline{\Lambda}$

$\Gamma(\Lambda\overline{\Lambda}\pi^+\pi^-)/\Gamma_{total}$ — Γ_{48}/Γ

VALUE (units 10^{-3})	CL%	DOCUMENT ID		TECN	COMMENT
<4.0	90	[46] ABLIKIM	06D	BES2	$\psi(2S) \rightarrow \chi_{c0}\gamma$

$\Gamma(K^+\overline{p}\Lambda + c.c.)/\Gamma_{total}$ — Γ_{49}/Γ

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
1.05±0.20±0.04	[48] ATHAR	07	CLEO	$\psi(2S) \rightarrow \gamma h^+ h^- h^0$

$\Gamma(\Xi^-\overline{\Xi}^+)/\Gamma_{total}$ — Γ_{50}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<10.3	90	[46] ABLIKIM	06D	BES2	$\psi(2S) \rightarrow \chi_{c0}\gamma$

$\Gamma(p\overline{p}) \times \Gamma(\pi\pi)/\Gamma^2_{total}$ — $\Gamma_{41}\Gamma_{21}/\Gamma^2$

VALUE (units 10^{-7})	DOCUMENT ID		TECN	COMMENT
15.8±1.6 OUR FIT				
15.3±2.4±0.8	[49] ANDREOTTI	03	E835	$\overline{p}p \rightarrow \chi_{c0} \rightarrow \pi^0\pi^0$

$\Gamma(p\overline{p}) \times \Gamma(\pi^0\eta)/\Gamma^2_{total}$ $\Gamma_{41}\Gamma_{22}/\Gamma^2$

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

$\Gamma(p\overline{p}) \times \Gamma(\pi^0\eta')/\Gamma^2_{total}$ $\Gamma_{41}\Gamma_{23}/\Gamma^2$

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

$\Gamma(p\overline{p}) \times \Gamma(\eta\eta)/\Gamma^2_{total}$ $\Gamma_{41}\Gamma_{24}/\Gamma^2$

VALUE (units 10^{-7})	DOCUMENT ID		TECN	COMMENT
5.1±0.9 OUR FIT				
$4.0\pm1.2^{+0.5}_{-0.3}$	ANDREOTTI	05C	E835	$\overline{p}p \to \eta\eta$

$\Gamma(p\overline{p}) \times \Gamma(\eta\eta')/\Gamma^2_{total}$ $\Gamma_{41}\Gamma_{26}/\Gamma^2$

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

[9] ABLIKIM 04G reports $[B(\chi_{c0}(1P) \to f_0(980) f_0(980))] \times [B(\psi(2S) \to \gamma\chi_{c0}(1P))] = (6.5 \pm 1.6 \pm 1.3) \times 10^{-5}$. We divide by our best value $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.4 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[10] ABLIKIM 05Q reports $[B(\chi_{c0}(1P) \to f_0(980) f_0(980))] \times [B(\psi(2S) \to \gamma\chi_{c0}(1P))] = (1.59 \pm 0.50^{+0.89}_{-0.72}) \times 10^{-5}$. We divide by our best value $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.4 \pm 0.4) \times 10^{-2}$. 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.

[11] ABLIKIM 05Q reports $(8.42 \pm 1.42^{+1.65}_{-2.29}) \times 10^{-4}$ for $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$. We rescale to our best value $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.4 \pm 0.4) \times 10^{-2}$. 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.

[12] ABLIKIM 05Q reports $< 2.9 \times 10^{-4}$ for $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$. We rescale to our best value $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = 0.094$. One of the $f_0(1370)$ mesons is identified via decay to $\pi^+\pi^-$ while the other via K^+K^- decay.

[13] ABLIKIM 05Q reports $< 1.8 \times 10^{-4}$ for $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$. We rescale to our best value $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = 0.094$. The f_0 mesons are identified via $f_0(1370) \to \pi^+\pi^-$ and $f_0(1500) \to K^+K^-$ decays.

[14] ABLIKIM 05Q reports $(7.12 \pm 1.85^{+3.28}_{-1.68}) \times 10^{-4}$ for $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$. We rescale to our best value $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.4 \pm 0.4) \times 10^{-2}$. 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.

[15] ABLIKIM 05Q reports $< 1.4 \times 10^{-4}$ for $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$. We rescale to our best value $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = 0.094$. The f_0 mesons are identified via $f_0(1500) \to \pi^+\pi^-$ and $f_0(1370) \to K^+K^-$ decays.

[16] ABLIKIM 05Q reports $< 0.55 \times 10^{-4}$ for B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = $(9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$. We rescale to our best value B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = 0.094. One of the $f_0(1500)$ is identified via decay to $\pi^+\pi^-$ while the other via K^+K^- decay.

[17] ABLIKIM 05Q reports $< 0.73 \times 10^{-4}$ for B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = $(9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$. We rescale to our best value B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = 0.094. The f_0 mesons are identified via $f_0(1500) \rightarrow \pi^+\pi^-$ and $f_0(1710) \rightarrow K^+K^-$ decays.

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

[19] ABLIKIM 05Q reports $(6.66 \pm 1.31^{+1.60}_{-1.51}) \times 10^{-3}$ for B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = $(9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$. We rescale to our best value B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = $(9.4 \pm 0.4) \times 10^{-2}$. 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 ± 6%.

[20] ABLIKIM 05Q reports $< 2.85 \times 10^{-3}$ for B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = $(9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$. We rescale to our best value B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = 0.094. The measurement assumes B($K_1(1400) \rightarrow K^*(892)\pi$) = 94 ± 6%.

[21] ABLIKIM 05Q reports [B($\chi_{c0}(1P) \rightarrow K^*(892)^0\overline{K}^*(892)^0$)] × [B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$)] = $(0.168 \pm 0.035^{+0.047}_{-0.040}) \times 10^{-3}$. We divide by our best value B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = $(9.4 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

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

[23] ABLIKIM 04H reports [B($\chi_{c0}(1P) \rightarrow K^*(892)^0\overline{K}^*(892)^0$)] × [B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$)] = $(1.53 \pm 0.29 \pm 0.26) \times 10^{-4}$. We divide by our best value B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = $(9.4 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[24] ABLIKIM 05Q reports $(10.44 \pm 2.37^{+3.05}_{-1.90}) \times 10^{-4}$ for B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = $(9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$. We rescale to our best value B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = $(9.4 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[25] ABLIKIM 05Q reports $(8.49 \pm 1.66^{+1.32}_{-1.99}) \times 10^{-4}$ for B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = $(9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$. We rescale to our best value B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = $(9.4 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

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

[27] ABLIKIM 06R reports $< 1.1 \times 10^{-3}$ for B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = $(9.2 \pm 0.4) \times 10^{-2}$. We rescale to our best value B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = 0.094.

[28] ADAMS 07 reports $< 0.5 \times 10^{-3}$ for B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = $0.0922 \pm 0.0011 \pm 0.0046$. We rescale to our best value B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = 0.094.

[29] ADAMS 07 reports $(1.7 \pm 0.4 \pm 0.2) \times 10^{-3}$ for B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = $0.0922 \pm 0.0011 \pm 0.0046$. We rescale to our best value B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = $(9.4 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[30] ABLIKIM 05N reports [B($\chi_{c0}(1P) \rightarrow \omega\omega$)] × [B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$)] = $(0.212 \pm 0.053 \pm 0.037) \times 10^{-3}$. We divide by our best value B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = $(9.4 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[31] Using $\Gamma(\pi\pi) \times \Gamma(\gamma\gamma)/\Gamma_{total}$ from the $\pi^+\pi^-$ measurement of NAKAZAWA 05 rescaled by 3/2 to convert to $\pi\pi$.

[32] Not independent from other measurements.
[33] Using $\Gamma(K^+ K^-) \times \Gamma(\gamma\gamma)/\Gamma_{total}$ from NAKAZAWA 05.
[34] ATHAR 07 reports $< 0.21 \times 10^{-3}$ for B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = $(9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$. We rescale to our best value B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = 0.094.
[35] ATHAR 07 reports $< 0.38 \times 10^{-3}$ for B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = $(9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$. We rescale to our best value B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = 0.094.
[36] ATHAR 07 reports $< 0.10 \times 10^{-3}$ for B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = $(9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$. We rescale to our best value B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = 0.094.
[37] ABLIKIM 06R reports $< 0.70 \times 10^{-3}$ for B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = $(9.2 \pm 0.4) \times 10^{-2}$. We rescale to our best value B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = 0.094.
[38] We have multiplied the $K^0_S K^+ \pi^-$ measurement by a factor of 2 to convert to $K^0 K^+ \pi^-$.
[39] ATHAR 07 reports $< 0.06 \times 10^{-3}$ for B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = $(9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$. We rescale to our best value B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = 0.094.
[40] ATHAR 07 reports $< 0.24 \times 10^{-3}$ for B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = $(9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$. We rescale to our best value B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = 0.094.
[41] ABLIKIM 05O reports [B($\chi_{c0}(1P) \rightarrow K^+ K^- K^0_S K^0_S$)] × [B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$)] = $(0.138 \pm 0.039 \pm 0.025) \times 10^{-3}$. We divide by our best value B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = $(9.4 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.
[42] ABLIKIM 06T reports $(1.03 \pm 0.22 \pm 0.15) \times 10^{-3}$ for B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = $(9.2 \pm 0.4) \times 10^{-2}$. We rescale to our best value B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = $(9.4 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.
[43] ABLIKIM 05O reports [B($\chi_{c0}(1P) \rightarrow K^0_S K^0_S \pi^+ \pi^-$)] × [B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$)] = $(0.558 \pm 0.051 \pm 0.089) \times 10^{-3}$. We divide by our best value B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = $(9.4 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.
[44] ATHAR 07 reports $(0.59 \pm 0.10 \pm 0.08) \times 10^{-3}$ for B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = $(9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$. We rescale to our best value B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = $(9.4 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.
[45] ATHAR 07 reports $(0.39 \pm 0.11 \pm 0.04) \times 10^{-3}$ for B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = $(9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$. We rescale to our best value B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = $(9.4 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.
[46] Using B($\psi(2S) \rightarrow \chi_{c0}\gamma$) = (9.2 ± 0.5)%
[47] ABLIKIM 06I reports [B($\chi_{c0}(1P) \rightarrow p\overline{n}\pi^-$)] × [B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$)] = $(1.10 \pm 0.24 \pm 0.18) \times 10^{-4}$. We divide by our best value B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = $(9.4 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.
[48] ATHAR 07 reports $(1.07 \pm 0.17 \pm 0.12) \times 10^{-3}$ for B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = $(9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$. We rescale to our best value B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = $(9.4 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.
[49] We have multiplied B($p\overline{p}$)·B($\pi^0\pi^0$) measurement by 3 to obtain B($p\overline{p}$)·B($\pi\pi$).

RADIATIVE DECAYS

$\Gamma(\gamma J/\psi(1S))/\Gamma_{total}$ — Γ_{51}/Γ

VALUE (units 10^{-4})	DOCUMENT ID	TECN	COMMENT
128±11 OUR FIT			
• • • We do not use the following data for averages, fits, limits, etc. • • •			
200±20±20	[50] ADAM 05A	CLEO	$e^+e^- \to \psi(2S) \to \gamma\chi_{c0}$

$\Gamma(\gamma\gamma)/\Gamma_{total}$ — Γ_{52}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID	TECN	COMMENT
2.35±0.23 OUR FIT				
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<8	90	[51] WICHT 08	BELL	$B^\pm \to K^\pm\gamma\gamma$

$\Gamma(\gamma\gamma)/\Gamma(\gamma J/\psi(1S))$ — Γ_{52}/Γ_{51}

VALUE (units 10^{-2})	DOCUMENT ID	TECN	COMMENT
1.83±0.25 OUR FIT			
2.0 ±0.4 OUR AVERAGE			
$2.2 \pm0.4 ^{+0.1}_{-0.2}$	[52] ANDREOTTI 04	E835	$p\overline{p} \to \chi_{c0} \to \gamma\gamma$
1.45±0.74	[53] AMBROGIANI 00B	E835	$\overline{p}p \to \chi_{c2} \to \gamma\gamma, \gamma J/\psi$

$\Gamma(p\overline{p}) \times \Gamma(\gamma J/\psi(1S))/\Gamma^2_{total}$ — $\Gamma_{41}\Gamma_{51}/\Gamma^2$

VALUE (units 10^{-7})	EVTS	DOCUMENT ID	TECN	COMMENT
27.5±1.9 OUR FIT				
28.2±2.1 OUR AVERAGE				
28.0±1.9±1.3	392	[53,54,55] BAGNASCO 02	E835	$\overline{p}p \to \chi_{c0} \to J/\psi\gamma$
$29.3^{+5.7}_{-4.7}\pm1.5$	89	[53,54] AMBROGIANI 99B		$\overline{p}p \to \chi_{c0} \to J/\psi\gamma$

$\Gamma(p\overline{p}) \times \Gamma(\gamma\gamma)/\Gamma^2_{total}$ — $\Gamma_{41}\Gamma_{52}/\Gamma^2$

VALUE (units 10^{-8})	DOCUMENT ID	TECN	COMMENT
5.0 ±0.7 OUR FIT			
• • • We do not use the following data for averages, fits, limits, etc. • • •			
$6.52\pm1.18^{+0.48}_{-0.72}$	[52] ANDREOTTI 04	E835	$p\overline{p} \to \chi_{c0} \to \gamma\gamma$

[50] Uses B($\psi(2S) \to \gamma\chi_{c0} \to \gamma\gamma J/\psi$) from ADAM 05A and B($\psi(2S) \to \gamma\chi_{c0}$) from ATHAR 04.

[51] WICHT 08 reports [B($\chi_{c0}(1P) \to \gamma\gamma$)] × [B($B^+ \to \chi_{c0}(1P) K^+$)] < 0.11×10^{-6}. We divide by our best value B($B^+ \to \chi_{c0}(1P) K^+$) = 0.000140.

[52] 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.

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

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

[55] Recalculated by ANDREOTTI 05A.

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

$B(\chi_{c0}(1P) \to p\overline{p}) \times B(\psi(2S) \to \gamma\chi_{c0}(1P))$

VALUE (units 10^{-6})	EVTS	DOCUMENT ID		TECN	COMMENT
20.1±2.1 OUR FIT					
$23.6^{+3.7}_{-3.4}\pm3.4$	89.5^{+14}_{-13}	BAI	04F	BES	$\psi(2S) \to \gamma\chi_{c0}(1P) \to \gamma\overline{p}p$

$B(\chi_{c0}(1P) \to p\overline{p}) \times \frac{\Gamma(\psi(2S) \to \gamma\chi_{c0}(1P))}{\Gamma(\psi(2S) \to J/\psi(1S)\pi^+\pi^-)}$

VALUE (units 10^{-5})	DOCUMENT ID		TECN	COMMENT
6.2±0.8 OUR FIT				
4.6±1.9	[56] BAI	98I	BES	$\psi(2S) \to \gamma\chi_{c0} \to \gamma\overline{p}p$

[56] 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].

$B(\chi_{c0}(1P) \to \gamma J/\psi(1S)) \times B(\psi(2S) \to \gamma\chi_{c0}(1P))$

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
0.120±0.010 OUR FIT					
0.073±0.018 OUR AVERAGE					
0.069±0.018		[57] OREGLIA	82	CBAL	$\psi(2S) \to \gamma\chi_{c0}$
0.4 ±0.3		[58] BRANDELIK	79B	DASP	$\psi(2S) \to \gamma\chi_{c0}$
0.16 ±0.11		[58] BARTEL	78B	CNTR	$\psi(2S) \to \gamma\chi_{c0}$
3.3 ±1.7		[59] BIDDICK	77	CNTR	$e^+e^- \to \gamma X$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.18 ±0.01 ±0.02	172	[60] ADAM	05A	CLEO	$\psi(2S) \to J/\psi\gamma\gamma$

[57] Recalculated by us using $B(J/\psi(1S) \to \ell^+\ell^-) = 0.1181 \pm 0.0020$.
[58] Recalculated by us using $B(J/\psi(1S) \to \mu^+\mu^-) = 0.0588 \pm 0.0010$.
[59] Assumes isotropic gamma distribution.
[60] Not independent from other values reported by ADAM 05A.

$B(\chi_{c0}(1P) \to \gamma J/\psi) \times \frac{\Gamma(\psi(2S) \to \gamma\chi_{c0}(1P))}{\Gamma(\psi(2S) \to J/\psi(1S) anything)}$

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
0.2091±0.0032 OUR FIT					
0.31 ±0.02 ±0.03	172	ADAM	05A	CLEO	$\psi(2S) \to J/\psi\gamma\gamma$

$B(\chi_{c0}(1P) \to \gamma J/\psi) \times \frac{\Gamma(\psi(2S) \to \gamma\chi_{c0}(1P))}{\Gamma(\psi(2S) \to J/\psi(1S)\pi^+\pi^-)}$

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
0.368±0.032 OUR FIT					
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.55 ±0.04 ±0.06	172	[61] ADAM	05A	CLEO	$\psi(2S) \to J/\psi\gamma\gamma$

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

$B(\chi_{c0}(1P) \to \gamma\gamma) \times B(\psi(2S) \to \gamma\chi_{c0}(1P))$

VALUE (units 10^{-5})	DOCUMENT ID		TECN	COMMENT
2.20±0.26 OUR FIT				
3.7 ±1.8 ±1.0	LEE	85	CBAL	$\psi(2S) \to \gamma\chi_{c0}$

$B(\chi_{c0}(1P) \to \pi\pi) \times \frac{\Gamma(\psi(2S) \to \gamma\chi_{c0}(1P))}{\Gamma(\psi(2S) \to J/\psi(1S)\pi^+\pi^-)}$

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
21.1±1.7 OUR FIT					
20.7±1.7 OUR AVERAGE					
23.9±2.7±4.1	97 ± 11	[62] BAI	03C	BES	$\psi(2S) \to \gamma\chi_{c0} \to \gamma\pi^0\pi^0$
20.2±1.1±1.5	720 ± 32	[63] BAI	98I	BES	$\psi(2S) \to \gamma\chi_{c0} \to \gamma\pi^+\pi^-$

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

[63] 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 ± 0.8)% and $B(\psi' \to J/\psi\pi^+\pi^-)$ = (32.4 ± 2.6)% [BAI 98D]. We have multiplied $\pi^+\pi^-$ measurement by 3/2 to obtain $\pi\pi$.

$B(\chi_{c0}(1P) \to \eta\eta) \times B(\psi(2S) \to \gamma\chi_{c0}(1P))$

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
2.2 ±0.4 OUR FIT					
2.86±0.46±0.37	48	[64] ADAMS	07	CLEO	$\psi(2S) \to \gamma\chi_{c0}$

[64] 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 ± 0.11 ± 0.46)% (ATHAR 04).

$B(\chi_{c0}(1P) \to \eta\eta) \times \frac{\Gamma(\psi(2S) \to \gamma\chi_{c0}(1P))}{\Gamma(\psi(2S) \to J/\psi(1S)\pi^+\pi^-)}$

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
0.68 ±0.12 OUR FIT				
0.578±0.241±0.158	BAI	03C	BES	$\psi(2S) \to \gamma\eta\eta$

$B(\chi_{c0}(1P) \to K^+K^-) \times \frac{\Gamma(\psi(2S) \to \gamma\chi_{c0}(1P))}{\Gamma(\psi(2S) \to J/\psi(1S)\pi^+\pi^-)}$

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
1.65±0.17 OUR FIT					
1.63±0.10±0.15	774 ± 38	[65] BAI	98I	BES	$\psi(2S) \to \gamma K^+K^-$

[65] 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 ± 0.8)% and $B(\psi(2S) \to J/\psi\pi^+\pi^-)$ = (32.4 ± 2.6)% [BAI 98D].

$B(\chi_{c0}(1P) \to K^0_S K^0_S) \times B(\psi(2S) \to \gamma\chi_{c0}(1P))$

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
2.64±0.25 OUR FIT					
3.02±0.19±0.33	322	ABLIKIM	05O	BES2	$\psi(2S) \to \gamma K^0_S K^0_S$

$B(\chi_{c0}(1P) \to K^0_S K^0_S) \times \Gamma(\psi(2S) \to \gamma \chi_{c0}(1P)) / \Gamma(\psi(2S) \to J/\psi(1S) \pi^+ \pi^-)$

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
8.1±0.8 OUR FIT				
5.6±0.8±1.3	[66] BAI	99B	BES	$\psi(2S) \to \gamma K^0_S K^0_S$

[66] 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].

$B(\chi_{c0}(1P) \to 2(\pi^+\pi^-)) \times \Gamma(\psi(2S) \to \gamma \chi_{c0}(1P)) / \Gamma(\psi(2S) \to J/\psi(1S) \pi^+ \pi^-)$

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
6.4±0.6 OUR FIT				
6.9±2.4 OUR AVERAGE Error includes scale factor of 3.8.				
4.4±0.1±0.9	[67] BAI	99B	BES	$\psi(2S) \to \gamma \chi_{c0}$
9.3±0.9	[68] TANENBAUM	78	MRK1	$\psi(2S) \to \gamma \chi_{c0}$

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

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

$B(\chi_{c0}(1P) \to K^+ K^- \pi^+ \pi^-) \times B(\psi(2S) \to \gamma \chi_{c0}(1P))$

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
1.68±0.13 OUR FIT				
1.64±0.05±0.2	ABLIKIM	05Q	BES2	$\psi(2S) \to \gamma \chi_{c0}$

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

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	$\psi(2S) \to \gamma \chi_{c0}$
7.4 ±1.0	[69] TANENBAUM	78	MRK1	$\psi(2S) \to \gamma \chi_{c0}$

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

$B(\chi_{c0}(1P) \to K^+ K^- K^+ K^-) \times B(\psi(2S) \to \gamma \chi_{c0}(1P))$

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
2.63±0.27 OUR FIT					
3.20±0.11±0.41	278	[70] ABLIKIM	06T	BES2	$\psi(2S) \to \gamma 2K^+ 2K^-$

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

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

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
8.1±0.8 OUR FIT				
6.1±0.8±0.9	[71] BAI	99B	BES	$\psi(2S) \to \gamma 2K^+2K^-$

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

$B(\chi_{c0}(1P) \to \phi\phi) \times B(\psi(2S) \to \gamma\chi_{c0}(1P))$

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
0.87±0.18 OUR FIT					
0.86±0.19±0.12	26	[72] ABLIKIM	06T	BES2	$\psi(2S) \to \gamma 2K^+2K^-$

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

$B(\chi_{c0}(1P) \to \phi\phi) \times \Gamma(\psi(2S) \to \gamma\chi_{c0}(1P)) / \Gamma(\psi(2S) \to J/\psi(1S)\pi^+\pi^-)$

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
2.7±0.6 OUR FIT				
2.6±1.0±1.1	[73] BAI	99B	BES	$\psi(2S) \to \gamma 2K^+2K^-$

[73] 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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