$\chi_{c0}(1P)$

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

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

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
3414.75± 0.35 OUR AVERAGE		Error includes scale factor of 1.2.			
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	$\psi(2S) \to \gamma\chi_{c0}$
$3414.7\ ^{+0.7}_{-0.6}\ \pm0.2$		[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	$\overline{p}p \to \chi_{c0} \to J/\psi\gamma$
$3417.4\ ^{+1.8}_{-1.9}\ \pm0.2$		[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±0.7 OUR FIT					
10.5±0.9 OUR AVERAGE		Error includes scale factor of 1.2.			
$12.6^{+1.5}_{-1.6}{}^{+0.9}_{-1.1}$		ABLIKIM	05G	BES2	$\psi(2S) \to \gamma\chi_{c0}$
$8.6^{+1.7}_{-1.3}\pm0.1$		ANDREOTTI	03	E835	$\overline{p}p \to \chi_{c0} \to \pi^0\pi^0$
9.7±1.0	392	[5] BAGNASCO	02	E835	$\overline{p}p \to \chi_{c0} \to J/\psi\gamma$
$16.6^{+5.2}_{-3.7}\pm0.1$		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	$2(\pi^+\pi^-)$	(2.43 ± 0.23) %	
Γ_2	$f_0(980)f_0(980) \to 2\pi^+2\pi^-$	$(7.0 \pm2.2) \times 10^{-4}$	
Γ_3	$\pi^+\pi^- K^+ K^-$	(2.0 ± 0.4) %	S=1.6
Γ_4	$f_0(980)f_0(980) \to \pi^+\pi^- K^+ K^-$	$(1.7 {}^{+1.1}_{-0.9}) \times 10^{-4}$	
Γ_5	$f_0(980)f_0(2200) \to \pi^+\pi^- K^+ K^-$	$(8.3 {}^{+2.1}_{-2.7}) \times 10^{-4}$	
Γ_6	$f_0(1370)f_0(1370) \to \pi^+\pi^- K^+ K^-$	$< 2.9 \times 10^{-4}$	CL=90%
Γ_7	$f_0(1370)f_0(1500) \to \pi^+\pi^- K^+ K^-$	$< 1.8 \times 10^{-4}$	CL=90%
Γ_8	$f_0(1370)f_0(1710) \to \pi^+\pi^- K^+ K^-$	$(7.1 {}^{+3.7}_{-2.5}) \times 10^{-4}$	
Γ_9	$f_0(1500)f_0(1370) \to \pi^+\pi^- K^+ K^-$	$< 1.4 \times 10^{-4}$	CL=90%
Γ_{10}	$f_0(1500)f_0(1500) \to \pi^+\pi^- K^+ K^-$	$< 5 \times 10^{-5}$	CL=90%
Γ_{11}	$f_0(1500)f_0(1710) \to \pi^+\pi^- K^+ K^-$	$< 7 \times 10^{-5}$	CL=90%
Γ_{12}	$\rho^0\pi^+\pi^-$	(1.6 ± 0.5) %	
Γ_{13}	$3(\pi^+\pi^-)$	(1.20 ± 0.18) %	
Γ_{14}	$K^+\overline{K}^*(892)^0\pi^-$ + c.c.	(1.2 ± 0.4) %	
Γ_{15}	$K_1(1270)^+K^-$ + c.c. $\to \pi^+\pi^- K^+ K^-$	$(6.6 \pm2.0) \times 10^{-3}$	
Γ_{16}	$K_1(1400)^+K^-$ + c.c. $\to \pi^+\pi^- K^+ K^-$	$< 2.8 \times 10^{-3}$	CL=90%
Γ_{17}	$K^*(892)^0\overline{K}^*(892)^0$	$(1.8 \pm0.6) \times 10^{-3}$	
Γ_{18}	$K_0^*(1430)^0\overline{K}_0^*(1430)^0 \to \pi^+\pi^- K^+ K^-$	$(1.04{}^{+0.38}_{-0.30}) \times 10^{-3}$	
Γ_{19}	$K_0^*(1430)^0\overline{K}_2^*(1430)^0$ + c.c. $\to \pi^+\pi^- K^+ K^-$	$(8.4 {}^{+2.1}_{-2.6}) \times 10^{-4}$	
Γ_{20}	$\pi\pi$	$(7.3 \pm0.6) \times 10^{-3}$	
Γ_{21}	$\pi^0\eta$		
Γ_{22}	$\pi^0\eta'$		
Γ_{23}	$\eta\eta$	$(2.4 \pm0.4) \times 10^{-3}$	
Γ_{24}	$\eta\pi^+\pi^-$	$< 1.1 \times 10^{-3}$	CL=90%
Γ_{25}	$\eta\eta'$	$< 5 \times 10^{-4}$	CL=90%
Γ_{26}	$\eta'\eta'$	$(1.7 \pm0.4) \times 10^{-3}$	
Γ_{27}	$\omega\omega$	$(2.3 \pm0.7) \times 10^{-3}$	
Γ_{28}	K^+K^-	$(5.5 \pm0.6) \times 10^{-3}$	
Γ_{29}	$K_S^0K_S^0$	$(2.77\pm0.34) \times 10^{-3}$	
Γ_{30}	$\pi^+\pi^-\eta$	$< 2.1 \times 10^{-4}$	
Γ_{31}	$\pi^+\pi^-\eta'$	$< 4 \times 10^{-4}$	
Γ_{32}	$K^0K^+\pi^-$ + c.c.	$< 9.9 \times 10^{-5}$	

Γ_{33}	$K^+K^-\pi^0$	$< 6 \times 10^{-5}$	
Γ_{34}	$K^+K^-\eta$	$< 2.4 \times 10^{-4}$	
Γ_{35}	$K^+K^-K^0_S K^0_S$	$(1.5 \pm 0.5) \times 10^{-3}$	
Γ_{36}	$K^+K^-K^+K^-$	$(2.74 \pm 0.33) \times 10^{-3}$	
Γ_{37}	$K^+K^-\phi$	$(1.02 \pm 0.26) \times 10^{-3}$	
Γ_{38}	$K^0_S K^0_S \pi^+\pi^-$	$(6.0 \pm 1.1) \times 10^{-3}$	
Γ_{39}	$\phi\phi$	$(9.3 \pm 2.2) \times 10^{-4}$	
Γ_{40}	$p\overline{p}$	$(2.10 \pm 0.19) \times 10^{-4}$	
Γ_{41}	$p\overline{p}\pi^0$	$(5.8 \pm 1.3) \times 10^{-4}$	
Γ_{42}	$p\overline{p}\eta$	$(3.9 \pm 1.2) \times 10^{-4}$	
Γ_{43}	$\pi^+\pi^- p\overline{p}$	$(2.1 \pm 0.7) \times 10^{-3}$	S=1.4
Γ_{44}	$K^0_S K^0_S p\overline{p}$	$< 8.8 \times 10^{-4}$	CL=90%
Γ_{45}	$p\overline{n}\pi^-$	$(1.18 \pm 0.33) \times 10^{-3}$	
Γ_{46}	$\Lambda\overline{\Lambda}$	$(4.4 \pm 1.5) \times 10^{-4}$	
Γ_{47}	$\Lambda\overline{\Lambda}\pi^+\pi^-$	$< 4.0 \times 10^{-3}$	CL=90%
Γ_{48}	$K^+\overline{p}\Lambda +$ c.c.	$(1.06 \pm 0.20) \times 10^{-3}$	
Γ_{49}	$\Xi^-\overline{\Xi}^+$	$< 1.03 \times 10^{-3}$	CL=90%

Radiative decays

Γ_{50}	$\gamma J/\psi(1S)$	(1.32 ± 0.11) %	
Γ_{51}	$\gamma\gamma$	$(2.76 \pm 0.33) \times 10^{-4}$	

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

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

$\Gamma(p\overline{p}) \times \Gamma(\gamma J/\psi(1S))/\Gamma_{\text{total}}$ — $\Gamma_{40}\Gamma_{50}/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID		TECN	COMMENT
28.8± 2.7 OUR FIT					
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$26.6 \pm 2.6 \pm 1.4$	392	[6,7] BAGNASCO	02	E835	$\overline{p}p \to \chi_{c0} \to J/\psi\gamma$
$48.7^{+11.3}_{-8.9} \pm 2.4$		[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 $(\Gamma(p\overline{p}) \times \Gamma(\gamma J/\psi(1S))/\Gamma_{\text{total}})$ 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.

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

$\Gamma(\pi\pi) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ — $\Gamma_{20}\Gamma_{51}/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID		TECN	COMMENT
20.9±3.0 OUR FIT					
22.7±3.2±3.5	129 ± 18	[8] NAKAZAWA	05	BELL	$e^+e^- \to e^+e^-\chi_{c0}$

$\Gamma(K^+K^-) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ — $\Gamma_{28}\Gamma_{51}/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID		TECN	COMMENT
15.7±2.2 OUR FIT					
14.3±1.6±2.3	153 ± 17	NAKAZAWA	05	BELL	$e^+e^- \to e^+e^-\chi_{c0}$

$\Gamma(2(\pi^+\pi^-)) \times \Gamma(\gamma\gamma)/\Gamma_{total}$ — $\Gamma_1\Gamma_{51}/\Gamma$

VALUE (eV)	DOCUMENT ID		TECN	COMMENT
70± 9 OUR FIT				
75±13±8	EISENSTEIN	01	CLE2	$e^+e^- \rightarrow e^+e^-\chi_{c0}$

[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

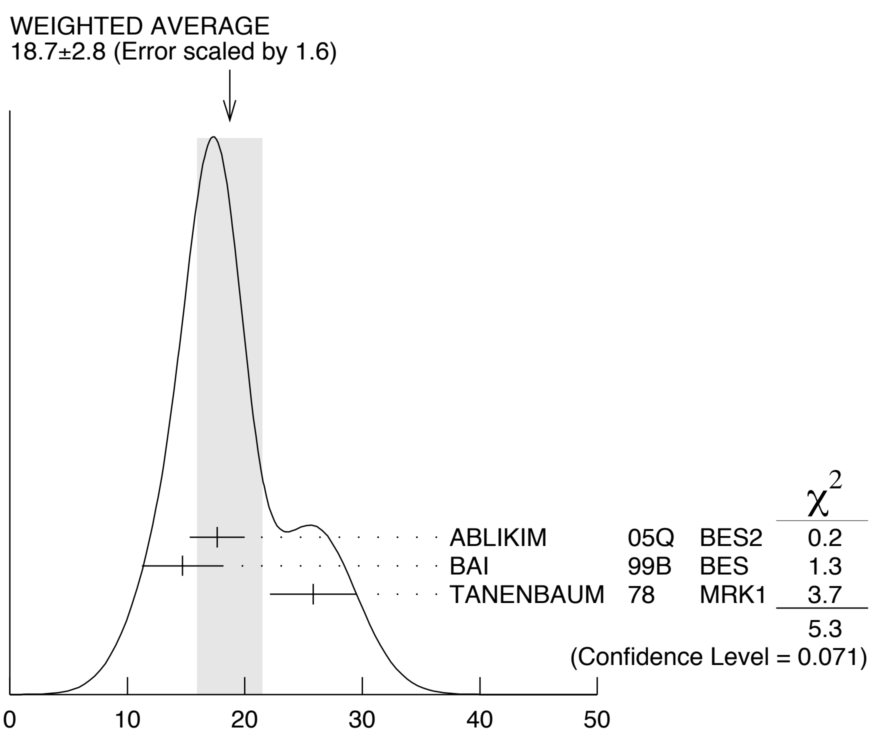
VALUE	DOCUMENT ID
0.0243±0.0023 OUR FIT	

$\Gamma(f_0(980) f_0(980) \rightarrow 2\pi^+ 2\pi^-)/\Gamma_{total}$ — Γ_2/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
7.0±2.2±0.3	36 ± 9	[9] ABLIKIM	04G	BES	$\psi(2S) \rightarrow \gamma 2\pi^+ 2\pi^-$

$\Gamma(\pi^+\pi^- K^+ K^-)/\Gamma_{total}$ — Γ_3/Γ

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
20 ±4 OUR EVALUATION Error includes scale factor of 1.6. Treating systematic error as correlated.				
18.7±2.8 OUR AVERAGE Error includes scale factor of 1.6. See the ideogram below.				
17.6±2.2±0.8	[10] ABLIKIM	05Q	BES2	$\psi(2S) \rightarrow \gamma\pi^+\pi^- K^+ K^-$
14.7±0.7±3.4	[11] BAI	99B	BES	$\psi(2S) \rightarrow \gamma\chi_{c0}$
25.8±3.5±1.1	[11] TANENBAUM	78	MRK1	$\psi(2S) \rightarrow \gamma\chi_{c0}$



$\Gamma(\pi^+\pi^- K^+ K^-)/\Gamma_{total}$ — Γ_3/Γ

$\Gamma(f_0(980) f_0(980) \to \pi^+\pi^- K^+K^-)/\Gamma_{total}$ — Γ_4/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
$17.^{+11.}_{-9.}\pm1.$	28	[12] ABLIKIM	05Q	BES2	$\psi(2S) \to \gamma\pi^+\pi^- K^+K^-$

$\Gamma(f_0(980) f_0(2200) \to \pi^+\pi^- K^+K^-)/\Gamma_{total}$ — Γ_5/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
$8.3^{+2.1}_{-2.6}\pm0.4$	77	[13] ABLIKIM	05Q	BES2	$\psi(2S) \to \gamma\pi^+\pi^- K^+K^-$

$\Gamma(f_0(1370) f_0(1370) \to \pi^+\pi^- K^+K^-)/\Gamma_{total}$ — Γ_6/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<2.9	90	[14] ABLIKIM	05Q	BES2	$\psi(2S) \to \gamma\pi^+\pi^- K^+K^-$

$\Gamma(f_0(1370) f_0(1500) \to \pi^+\pi^- K^+K^-)/\Gamma_{total}$ — Γ_7/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<1.8	90	[15] ABLIKIM	05Q	BES2	$\psi(2S) \to \gamma\pi^+\pi^- K^+K^-$

$\Gamma(f_0(1370) f_0(1710) \to \pi^+\pi^- K^+K^-)/\Gamma_{total}$ — Γ_8/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
$7.1^{+3.7}_{-2.5}\pm0.3$	61	[16] ABLIKIM	05Q	BES2	$\psi(2S) \to \gamma\pi^+\pi^- K^+K^-$

$\Gamma(f_0(1500) f_0(1370) \to \pi^+\pi^- K^+K^-)/\Gamma_{total}$ — Γ_9/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<1.4	90	[17] ABLIKIM	05Q	BES2	$\psi(2S) \to \gamma\pi^+\pi^- K^+K^-$

$\Gamma(f_0(1500) f_0(1500) \to \pi^+\pi^- K^+K^-)/\Gamma_{total}$ — Γ_{10}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<0.5	90	[18] ABLIKIM	05Q	BES2	$\psi(2S) \to \gamma\pi^+\pi^- K^+K^-$

$\Gamma(f_0(1500) f_0(1710) \to \pi^+\pi^- K^+K^-)/\Gamma_{total}$ — Γ_{11}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<0.7	90	[19] ABLIKIM	05Q	BES2	$\psi(2S) \to \gamma\pi^+\pi^- K^+K^-$

$\Gamma(\rho^0\pi^+\pi^-)/\Gamma_{total}$ — Γ_{12}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
0.016±0.005	[20] TANENBAUM	78	MRK1	$\psi(2S) \to \gamma\chi_{c0}$

$\Gamma(3(\pi^+\pi^-))/\Gamma_{total}$ — Γ_{13}/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	[11] BAI	99B	BES	$\psi(2S) \to \gamma\chi_{c0}$
12.6±2.9±0.6	[11] TANENBAUM	78	MRK1	$\psi(2S) \to \gamma\chi_{c0}$

$\Gamma(K^+\overline{K}^*(892)^0\pi^- + \text{c.c.})/\Gamma_{total}$ — Γ_{14}/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
0.012±0.004	[20] 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_{15}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
6.6±2.0±0.3	68	[21] 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_{16}/Γ

VALUE (units 10^{-3})	CL%	DOCUMENT ID	TECN	COMMENT
<2.8	90	[22] ABLIKIM 05Q	BES2	$\psi(2S) \to \gamma\pi^+\pi^-K^+K^-$

$\Gamma(K^*(892)^0\overline{K}^*(892)^0)/\Gamma_{total}$ — Γ_{17}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
1.8±0.6±0.1	64	[23] 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	[24,25] 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_{18}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
$10.4^{+3.8}_{-3.0}\pm0.4$	83	[26] 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_{19}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
$8.4^{+2.1}_{-2.5}\pm0.4$	62	[27] ABLIKIM 05Q	BES2	$\psi(2S) \to \gamma\pi^+\pi^-K^+K^-$

$\Gamma(\pi\pi)/\Gamma_{total}$ — Γ_{20}/Γ

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

$\Gamma(\eta\eta)/\Gamma_{total}$ — Γ_{23}/Γ

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

$\Gamma(\eta\eta)/\Gamma(\pi\pi)$ — Γ_{23}/Γ_{20}

VALUE	DOCUMENT ID	TECN	COMMENT
0.33±0.07 OUR FIT			
• • • We do not use the following data for averages, fits, limits, etc. • • •			
$0.26\pm0.09^{+0.03}_{-0.02}$	[28] ANDREOTTI 05C	E835	$\overline{p}p \to$ 2 mesons
0.24±0.10±0.08	[28] BAI 03C	BES	$\psi(2S) \to 5\gamma$

$\Gamma(\eta\pi^+\pi^-)/\Gamma_{total}$ — Γ_{24}/Γ

VALUE (units 10^{-3})	CL%	DOCUMENT ID		TECN	COMMENT
<1.1	90	[29] ABLIKIM	06R	BES2	$\psi(2S) \to \gamma\chi_{c0}$

$\Gamma(\eta\eta')/\Gamma_{total}$ — Γ_{25}/Γ

VALUE (units 10^{-3})	CL%	DOCUMENT ID		TECN	COMMENT
<0.5	90	[30] ADAMS	07	CLEO	$\psi(2S) \to \gamma\chi_{c0}$

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

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
1.7±0.4±0.1	23	[31] ADAMS	07	CLEO	$\psi(2S) \to \gamma\chi_{c0}$

$\Gamma(\omega\omega)/\Gamma_{total}$ — Γ_{27}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
2.3±0.7±0.1	38.1 ± 9.6	[32] ABLIKIM	05N	BES2	$\psi(2S) \to \gamma\chi_{c0} \to \gamma 6\pi$

$\Gamma(K^+K^-)/\Gamma_{total}$ — Γ_{28}/Γ

VALUE (units 10^{-3})	DOCUMENT ID
5.5±0.6 OUR FIT	

$\Gamma(K^0_S K^0_S)/\Gamma_{total}$ — Γ_{29}/Γ

VALUE (units 10^{-3})	DOCUMENT ID
2.77±0.34 OUR FIT	

$\Gamma(\pi^+\pi^-\eta)/\Gamma_{total}$ — Γ_{30}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
<0.21	90	[33] ATHAR	07	CLEO	$\psi(2S) \to \gamma h^+ h^- h^0$

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

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
<0.4	90	[34] ATHAR	07	CLEO	$\psi(2S) \to \gamma h^+ h^- h^0$

$\Gamma(K^0 K^+\pi^- + c.c.)/\Gamma_{total}$ — Γ_{32}/Γ

VALUE (units 10^{-3})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
<0.10		90	[35] ATHAR	07	CLEO	$\psi(2S) \to \gamma h^+ h^- h^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<0.35	90		[36] ABLIKIM	06R	BES2	$\psi(2S) \to \gamma\chi_{c0}$
<1.4	90		[11,37] BAI	99B	BES	$\psi(2S) \to \gamma\chi_{c0}$

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

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
<0.06	90	[38] ATHAR	07	CLEO	$\psi(2S) \to \gamma h^+ h^- h^0$

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

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
<0.24	90	[39] ATHAR	07	CLEO	$\psi(2S) \to \gamma h^+ h^- h^0$

$\Gamma(K^+K^-K^0_S K^0_S)/\Gamma_{total}$ Γ_{35}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
1.5±0.5±0.1	16.8 ± 4.8	[40] ABLIKIM	05O	BES2	$\psi(2S) \to \gamma\chi_{c0}$

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

VALUE (units 10^{-3})	DOCUMENT ID
2.74±0.33 OUR FIT	

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

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
1.02±0.26±0.04	38	[41] ABLIKIM	06T	BES2	$\psi(2S) \to \gamma 2K^+2K^-$

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

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
6.0±1.1±0.3	152 ± 14	[42] ABLIKIM	05O	BES2	$\psi(2S) \to \gamma\chi_{c0}$

$\Gamma(\phi\phi)/\Gamma_{total}$ Γ_{39}/Γ

VALUE (units 10^{-3})	DOCUMENT ID
0.93±0.22 OUR FIT	

$\Gamma(p\overline{p})/\Gamma_{total}$ Γ_{40}/Γ

VALUE (units 10^{-4})	DOCUMENT ID
2.10±0.19 OUR FIT	

$\Gamma(p\overline{p}\pi^0)/\Gamma_{total}$ Γ_{41}/Γ

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
0.58±0.12±0.03	[43] ATHAR	07	CLEO	$\psi(2S) \to \gamma h^+h^-h^0$

$\Gamma(p\overline{p}\eta)/\Gamma_{total}$ Γ_{42}/Γ

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
0.39±0.11±0.02	[44] ATHAR	07	CLEO	$\psi(2S) \to \gamma h^+h^-h^0$

$\Gamma(\pi^+\pi^- p\overline{p})/\Gamma_{total}$ Γ_{43}/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	[11] BAI	99B	BES	$\psi(2S) \to \gamma\chi_{c0}$
4.19±1.15±0.18	[11] TANENBAUM	78	MRK1	$\psi(2S) \to \gamma\chi_{c0}$

$\Gamma(K^0_S K^0_S p\overline{p})/\Gamma_{total}$ Γ_{44}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<8.8	90	[45] ABLIKIM	06D	BES2	$\psi(2S) \to \chi_{c0}\gamma$

$\Gamma(p\overline{n}\pi^-)/\Gamma_{total}$ Γ_{45}/Γ

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
11.8±3.2±0.5	[46] ABLIKIM	06I	BES2	$\psi(2S) \to \gamma p\pi^- X$

$\Gamma(\Lambda\overline{\Lambda})/\Gamma_{total}$ — Γ_{46}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
4.4±1.2±0.9	$15.2^{+4.2}_{-4.0}$	[11] BAI	03E	BES	$\psi(2S) \to \gamma\chi_{c0} \to \gamma\Lambda\overline{\Lambda}$

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

VALUE (units 10^{-3})	CL%	DOCUMENT ID		TECN	COMMENT
<4.0	90	[45] ABLIKIM	06D	BES2	$\psi(2S) \to \chi_{c0}\gamma$

$\Gamma(K^+\overline{p}\Lambda + \text{c.c.})/\Gamma_{total}$ — Γ_{48}/Γ

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
1.06±0.20±0.05	[47] ATHAR	07	CLEO	$\psi(2S) \to \gamma h^+ h^- h^0$

$\Gamma(\Xi^-\overline{\Xi}^+)/\Gamma_{total}$ — Γ_{49}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<10.3	90	[45] ABLIKIM	06D	BES2	$\psi(2S) \to \chi_{c0}\gamma$

$\Gamma(p\overline{p}) \times \Gamma(\pi\pi)/\Gamma^2_{total}$ — $\Gamma_{40}\Gamma_{20}/\Gamma^2$

VALUE (units 10^{-7})	DOCUMENT ID		TECN	COMMENT
15.3±1.6 OUR FIT				
15.3±2.4±0.8	[48] ANDREOTTI	03	E835	$\overline{p}p \to \chi_{c0} \to \pi^0\pi^0$

$\Gamma(p\overline{p}) \times \Gamma(\pi^0\eta)/\Gamma^2_{total}$ — $\Gamma_{40}\Gamma_{21}/\Gamma^2$

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

$\Gamma(p\overline{p}) \times \Gamma(\pi^0\eta')/\Gamma^2_{total}$ — $\Gamma_{40}\Gamma_{22}/\Gamma^2$

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

$\Gamma(p\overline{p}) \times \Gamma(\eta\eta)/\Gamma^2_{total}$ — $\Gamma_{40}\Gamma_{23}/\Gamma^2$

VALUE (units 10^{-7})	DOCUMENT ID		TECN	COMMENT
5.0±0.9 OUR FIT				
$4.0\pm1.2^{+0.5}_{-0.3}$	ANDREOTTI	05C	E835	$\overline{p}p \to \eta\eta$

$\Gamma(p\overline{p}) \times \Gamma(\eta\eta')/\Gamma^2_{total}$ — $\Gamma_{40}\Gamma_{25}/\Gamma^2$

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 $[B(\chi_{c0}(1P) \to f_0(980) f_0(980) \to 2\pi^+2\pi^-) \times B(\psi(2S) \to \gamma\chi_{c0}(1P))] = (6.5 \pm 1.6 \pm 1.3) \times 10^{-5}$. We divide by our best value $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.3 \pm 0.4) \times 10^{-2}$. 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 $[B(\chi_{c0}(1P) \to \pi^+\pi^-K^+K^-) \times B(\psi(2S) \to \gamma\chi_{c0}(1P))] = (1.64 \pm 0.05 \pm 0.20) \times 10^{-3}$. We divide by our best value $B(\psi(2S) \to \gamma\chi_{c0}(1P)) =$

$(9.3 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[11] Rescaled by us using B($\psi(2S) \to \gamma\chi_{c0}$)= (9.3 ± 0.4)% and B($\psi(2S) \to J/\psi(1S)\pi^+\pi^-$) = (32.3 ± 0.5)%.

[12] ABLIKIM 05Q reports [B($\chi_{c0}(1P) \to f_0(980) f_0(980) \to \pi^+\pi^- K^+K^-$) × 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($\psi(2S) \to \gamma\chi_{c0}(1P)$) = $(9.3 \pm 0.4) \times 10^{-2}$. 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.

[13] 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($\psi(2S) \to \gamma\chi_{c0}(1P)$) = $(9.3 \pm 0.4) \times 10^{-2}$. 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.

[14] 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($\psi(2S) \to \gamma\chi_{c0}(1P)$) = 0.093. One of the $f_0(1370)$ mesons is identified via decay to $\pi^+\pi^-$ while the other via K^+K^- decay.

[15] 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($\psi(2S) \to \gamma\chi_{c0}(1P)$) = 0.093. The f_0 mesons are identified via $f_0(1370) \to \pi^+\pi^-$ and $f_0(1500) \to K^+K^-$ decays.

[16] 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($\psi(2S) \to \gamma\chi_{c0}(1P)$) = $(9.3 \pm 0.4) \times 10^{-2}$. 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.

[17] 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($\psi(2S) \to \gamma\chi_{c0}(1P)$) = 0.093. The f_0 mesons are identified via $f_0(1500) \to \pi^+\pi^-$ and $f_0(1370) \to K^+K^-$ decays.

[18] ABLIKIM 05Q reports $< 0.55 \times 10^{-4}$ 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($\psi(2S) \to \gamma\chi_{c0}(1P)$) = 0.093. One of the $f_0(1500)$ is identified via decay to $\pi^+\pi^-$ while the other via K^+K^- decay.

[19] ABLIKIM 05Q reports $< 0.73 \times 10^{-4}$ 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($\psi(2S) \to \gamma\chi_{c0}(1P)$) = 0.093. The f_0 mesons are identified via $f_0(1500) \to \pi^+\pi^-$ and $f_0(1710) \to K^+K^-$ decays.

[20] Calculated using B($\psi(2S) \to \gamma\chi_{c0}(1P)$) = 0.094; the errors do not contain the uncertainty in the $\psi(2S)$ decay.

[21] ABLIKIM 05Q reports $(6.66 \pm 1.31^{+1.60}_{-1.51}) \times 10^{-3}$ 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($\psi(2S) \to \gamma\chi_{c0}(1P)$) = $(9.3 \pm 0.4) \times 10^{-2}$. 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($K_1(1270) \to K\rho(770)$) = 42 ± 6%.

[22] ABLIKIM 05Q reports $< 2.85 \times 10^{-3}$ 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($\psi(2S) \to \gamma\chi_{c0}(1P)$) = 0.093. The measurement assumes B($K_1(1400) \to K^*(892)\pi$) = 94 ± 6%.

[23] ABLIKIM 05Q reports [B($\chi_{c0}(1P) \to K^*(892)^0 \overline{K}^*(892)^0$) × B($\psi(2S) \to \gamma\chi_{c0}(1P)$)] = $(0.168 \pm 0.035^{+0.047}_{-0.040}) \times 10^{-3}$. We divide by our best value B($\psi(2S) \to \gamma\chi_{c0}(1P)$)

$= (9.3 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

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

[25] 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($\psi(2S) \rightarrow \gamma \chi_{c0}(1P)$) $= (9.3 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[26] 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($\psi(2S) \rightarrow \gamma \chi_{c0}(1P)$) = $(9.3 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[27] 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($\psi(2S) \rightarrow \gamma \chi_{c0}(1P)$) = $(9.3 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

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

[29] 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($\psi(2S) \rightarrow \gamma \chi_{c0}(1P)$) = 0.093.

[30] 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($\psi(2S) \rightarrow \gamma \chi_{c0}(1P)$) = 0.093.

[31] 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($\psi(2S) \rightarrow \gamma \chi_{c0}(1P)$) = $(9.3 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[32] 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($\psi(2S) \rightarrow \gamma \chi_{c0}(1P)$) = $(9.3 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[33] 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($\psi(2S) \rightarrow \gamma \chi_{c0}(1P)$) = 0.093.

[34] 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($\psi(2S) \rightarrow \gamma \chi_{c0}(1P)$) = 0.093.

[35] 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($\psi(2S) \rightarrow \gamma \chi_{c0}(1P)$) = 0.093.

[36] ABLIKIM 06R reports $< 0.35 \times 10^{-3}$ for B($\psi(2S) \rightarrow \gamma \chi_{c0}(1P)$) = $(9.2 \pm 0.4) \times 10^{-2}$. We rescale to our best value B($\psi(2S) \rightarrow \gamma \chi_{c0}(1P)$) = 0.093.

[37] Multiplied by a factor of 2 to convert from $K^0_S K^+ \pi^-$ to $K^0 K^+ \pi^-$ decay.

[38] 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($\psi(2S) \rightarrow \gamma \chi_{c0}(1P)$) = 0.093.

[39] 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($\psi(2S) \rightarrow \gamma \chi_{c0}(1P)$) = 0.093.

[40] 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($\psi(2S) \rightarrow \gamma \chi_{c0}(1P)$) $= (9.3 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[41] 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($\psi(2S) \rightarrow \gamma \chi_{c0}(1P)$) = $(9.3 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[42] ABLIKIM 05O reports $[B(\chi_{c0}(1P) \to K^0_S K^0_S \pi^+\pi^-) \times B(\psi(2S) \to \gamma\chi_{c0}(1P))] = (0.558 \pm 0.051 \pm 0.089) \times 10^{-3}$. We divide by our best value $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.3 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[43] ATHAR 07 reports $(0.59 \pm 0.10 \pm 0.08) \times 10^{-3}$ 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 $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.3 \pm 0.4) \times 10^{-2}$. 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 $(0.39 \pm 0.11 \pm 0.04) \times 10^{-3}$ 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 $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.3 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

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

[46] ABLIKIM 06I reports $[B(\chi_{c0}(1P) \to p\overline{n}\pi^-) \times B(\psi(2S) \to \gamma\chi_{c0}(1P))] = (1.10 \pm 0.24 \pm 0.18) \times 10^{-4}$. We divide by our best value $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.3 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[47] ATHAR 07 reports $(1.07 \pm 0.17 \pm 0.12) \times 10^{-3}$ 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 $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.3 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

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

RADIATIVE DECAYS

$\Gamma(\gamma J/\psi(1S))/\Gamma_{total}$ — Γ_{50}/Γ

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
132±11 OUR FIT				
• • • We do not use the following data for averages, fits, limits, etc. • • •				
200±20±20	[49] ADAM	05A	CLEO	$e^+e^- \to \psi(2S) \to \gamma\chi_{c0}$

$\Gamma(\gamma\gamma)/\Gamma_{total}$ — Γ_{51}/Γ

VALUE (units 10^{-4})	DOCUMENT ID
2.76±0.33 OUR FIT	

$\Gamma(\gamma\gamma)/\Gamma(\gamma J/\psi(1S))$ — Γ_{51}/Γ_{50}

VALUE (units 10^{-2})	DOCUMENT ID		TECN	COMMENT
2.09±0.34 OUR FIT				
2.0 ±0.4 OUR AVERAGE				
$2.2 \pm 0.4 ^{+0.1}_{-0.2}$	[50] ANDREOTTI	04	E835	$p\overline{p} \to \chi_{c0} \to \gamma\gamma$
1.45±0.74	[51] AMBROGIANI	00B	E835	$\overline{p}p \to \chi_{c2} \to \gamma\gamma, \gamma J/\psi$

$\Gamma(p\overline{p}) \times \Gamma(\gamma J/\psi(1S))/\Gamma^2_{total}$ — $\Gamma_{40}\Gamma_{50}/\Gamma^2$

VALUE (units 10^{-7})	EVTS	DOCUMENT ID		TECN	COMMENT
27.8±1.9 OUR FIT					
28.2±2.1 OUR AVERAGE					
28.0±1.9±1.3	392	[51,52,53] BAGNASCO	02	E835	$\overline{p}p \to \chi_{c0} \to J/\psi\gamma$
$29.3^{+5.7}_{-4.7}\pm1.5$	89	[51,52] AMBROGIANI	99B		$\overline{p}p \to \chi_{c0} \to J/\psi\gamma$

$\Gamma(p\overline{p}) \times \Gamma(\gamma\gamma)/\Gamma^2_{\text{total}}$ $\Gamma_{40}\Gamma_{51}/\Gamma^2$

VALUE (units 10^{-8})	DOCUMENT ID		TECN	COMMENT
5.8 ±0.8 OUR FIT				
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$6.52 \pm 1.18^{+0.48}_{-0.72}$	[50] ANDREOTTI	04	E835	$p\overline{p} \to \chi_{c0} \to \gamma\gamma$

[49] 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.

[50] 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.

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

[52] 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.

[53] Recalculated by ANDREOTTI 05A.

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

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

VALUE (units 10^{-5})	DOCUMENT ID		TECN	COMMENT
6.0±0.8 OUR FIT				
4.6±1.9	[54] BAI	98I	BES	$\psi(2S) \to \gamma\chi_{c0} \to \gamma\overline{p}p$

[54] 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 ± 0.8)% and B($\psi(2S) \to J/\psi(1S)\pi^+\pi^-$) = (32.4 ± 2.6)% [BAI 98D].

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

VALUE (units 10^{-6})	EVTS	DOCUMENT ID		TECN	COMMENT
19.5±2.0 OUR FIT					
$\mathbf{23.6^{+3.7}_{-3.4} \pm 3.4}$	89.5^{+14}_{-13}	BAI	04F	BES	$\psi(2S) \to \gamma\chi_{c0}(1P) \to \gamma\overline{p}p$

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

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
0.122±0.010 OUR FIT					
0.073±0.018 OUR AVERAGE					
0.069±0.018		[55] OREGLIA	82	CBAL	$\psi(2S) \to \gamma\chi_{c0}$
0.4 ±0.3		[56] BRANDELIK	79B	DASP	$\psi(2S) \to \gamma\chi_{c0}$
0.16 ±0.11		[56] BARTEL	78B	CNTR	$\psi(2S) \to \gamma\chi_{c0}$
3.3 ±1.7		[57] 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	[58] ADAM	05A	CLEO	$\psi(2S) \to J/\psi\gamma\gamma$

[55] Recalculated by us using B($J/\psi(1S) \to \ell^+\ell^-$) = 0.1181 ± 0.0020.

[56] Recalculated by us using B($J/\psi(1S) \to \mu^+\mu^-$) = 0.0588 ± 0.0010.

[57] Assumes isotropic gamma distribution.

[58] 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
0.2151±0.0035 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
0.379±0.032 OUR FIT					
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.55 ±0.04 ±0.06	172	[59] ADAM	05A	CLEO	$\psi(2S) \to J/\psi\gamma\gamma$

[59] 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
2.56±0.33 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
20.9±1.7 OUR FIT					
20.7±1.7 OUR AVERAGE					
23.9±2.7±4.1	97 ± 11	[60] BAI	03C	BES	$\psi(2S) \to \gamma\chi_{c0} \to \gamma\pi^0\pi^0$
20.2±1.1±1.5	720 ± 32	[61] BAI	98I	BES	$\psi(2S) \to \gamma\chi_{c0} \to \gamma\pi^+\pi^-$

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

[61] 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 $\pi\pi$.

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

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
2.2 ±0.4 OUR FIT					
2.86±0.46±0.37	48	[62] ADAMS	07	CLEO	$\psi(2S) \to \gamma\chi_{c0}$

[62] 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).

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

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
1.57±0.17 OUR FIT					
1.63±0.10±0.15	774 ± 38	[63] BAI	98I	BES	$\psi(2S) \to \gamma K^+K^-$

[63] 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].

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

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
2.57±0.30 OUR FIT					
3.02±0.19±0.33	322	ABLIKIM	05O	BES2	$\psi(2S) \to \gamma K^0_S K^0_S$

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

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
7.9±1.0 OUR FIT				
5.6±0.8±1.3	[64] BAI	99B	BES	$\psi(2S) \to \gamma K^0_S K^0_S$

[64] 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].

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

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
7.0±0.6 OUR FIT				
6.9±2.4 OUR AVERAGE	Error includes scale factor of 3.8.			
4.4±0.1±0.9	[65] BAI	99B	BES	$\psi(2S) \to \gamma\chi_{c0}$
9.3±0.9	[66] TANENBAUM	78	MRK1	$\psi(2S) \to \gamma\chi_{c0}$

[65] 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].

[66] 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 $B(J/\psi(1S) \to \ell^+\ell^-) = 0.1181 \pm 0.0020$.

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

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
2.53±0.29 OUR FIT					
3.20±0.11±0.41	278	[67] ABLIKIM	06T	BES2	$\psi(2S) \to \gamma 2K^+2K^-$

[67] 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
7.8±0.9 OUR FIT				
6.1±0.8±0.9	[68] BAI	99B	BES	$\psi(2S) \to \gamma 2K^+ 2K^-$

[68] 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
0.86±0.20 OUR FIT					
0.86±0.19±0.12	26	[69] ABLIKIM	06T	BES2	$\psi(2S) \to \gamma 2K^+ 2K^-$

[69] 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	[70] BAI	99B	BES	$\psi(2S) \to \gamma 2K^+ 2K^-$

[70] 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].

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

ABE	07	PRL 98 082001	K. Abe et al.	(BELLE Collab.)
ADAMS	07	PR D75 071101R	G.S. Adams et al.	(CLEO Collab.)
ATHAR	07	PR D75 032002	S.B. Athar et al.	(CLEO Collab.)
ABLIKIM	06D	PR D73 052006	M. Ablikim et al.	(BES Collab.)
ABLIKIM	06I	PR D74 012004	M. Ablikim et al.	(BES Collab.)
ABLIKIM	06R	PR D74 072001	M. Ablikim et al.	(BES Collab.)
ABLIKIM	06T	PL B642 197	M. Ablikim et al.	(BES Collab.)
ABLIKIM	05G	PR D71 092002	M. Ablikim et al.	(BES Collab.)
ABLIKIM	05N	PL B630 7	M. Ablikim et al.	(BES Collab.)
ABLIKIM	05O	PL B630 21	M. Ablikim et al.	(BES Collab.)
ABLIKIM	05Q	PR D72 092002	M. Ablikim et al.	(BES Collab.)
ADAM	05A	PRL 94 232002	N.E. Adam et al.	(CLEO Collab.)
ANDREOTTI	05A	NP B717 34	M. Andreotti et al.	(FNAL E835 Collab.)
ANDREOTTI	05C	PR D72 112002	M. Andreotti et al.	(FNAL E835 Collab.)
NAKAZAWA	05	PL B615 39	H. Nakazawa et al.	(BELLE Collab.)
ABE	04G	PR D70 071102	K. Abe et al.	(BELLE Collab.)
ABLIKIM	04G	PR D70 092002	M. Ablikim et al.	(BES Collab.)
ABLIKIM	04H	PR D70 092003	M. Ablikim et al.	(BES Collab.)
ANDREOTTI	04	PL B584 16	M. Andreotti et al.	(E835 Collab.)
ATHAR	04	PR D70 112002	S.B. Athar et al.	(CLEO Collab.)
BAI	04F	PR D69 092001	J.Z. Bai et al.	(BES Collab.)
ANDREOTTI	03	PRL 91 091801	M. Andreotti et al.	(FNAL E835 Collab.)
AULCHENKO	03	PL B573 63	V.M. Aulchenko et al.	(KEDR Collab.)
BAI	03C	PR D67 032004	J.Z. Bai et al.	(BES Collab.)

BAI	03E	PR D67 112001	J.Z. Bai *et al.*	(BES Collab.)
ABE,K	02	PRL 89 142001	K. Abe *et al.*	(BELLE Collab.)
BAGNASCO	02	PL B533 237	S. Bagnasco *et al.*	(FNAL E835 Collab.)
EISENSTEIN	01	PRL 87 061801	B.I. Eisenstein *et al.*	(CLEO Collab.)
AMBROGIANI	00B	PR D62 052002	M. Ambrogiani *et al.*	(FNAL E835 Collab.)
AMBROGIANI	99B	PRL 83 2902	M. Ambrogiani *et al.*	(FNAL E835 Collab.)
BAI	99B	PR D60 072001	J.Z. Bai *et al.*	(BES Collab.)
BAI	98D	PR D58 092006	J.Z. Bai *et al.*	(BES Collab.)
BAI	98I	PRL 81 3091	J.Z. Bai *et al.*	(BES Collab.)
GAISER	86	PR D34 711	J. Gaiser *et al.*	(Crystal Ball Collab.)
LEE	85	SLAC 282	R.A. Lee	(SLAC)
OREGLIA	82	PR D25 2259	M.J. Oreglia *et al.*	(SLAC, CIT, HARV+)
BRANDELIK	79B	NP B160 426	R. Brandelik *et al.*	(DASP Collab.)
BARTEL	78B	PL 79B 492	W. Bartel *et al.*	(DESY, HEIDP)
TANENBAUM	78	PR D17 1731	W.M. Tanenbaum *et al.*	(SLAC, LBL)
Also		Private Comm.	G. Trilling	(LBL, UCB)
BIDDICK	77	PRL 38 1324	C.J. Biddick *et al.*	(UCSD, UMD, PAVI+)

OTHER RELATED PAPERS

VANBEVEREN	06A	PR D74 037501	E. van Beberen *et al.*	
BARBERIS	00G	PL B485 357	D. Barberis *et al.*	(Omega Expt.)
ACCIARRI	99T	PL B461 155	M. Acciarri *et al.*	(L3 Collab.)
CHEN	90B	PL B243 169	W.Y. Chen *et al.*	(CLEO Collab.)
AIHARA	88D	PRL 60 2355	H. Aihara *et al.*	(TPC Collab.)
FELDMAN	75B	PRL 35 821	G.J. Feldman *et al.*	(LBL, SLAC)
Also Erratum.		PRL 35 1189	G.J. Feldman	
TANENBAUM	75	PRL 35 1323	W.M. Tanenbaum *et al.*	(LBL, SLAC)