$\chi_{c0}(1P)$

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

$\chi_{c0}(1P)$ 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	$e^+e^- \rightarrow J/\psi(c\overline{c})$
3414.21± 0.39±0.27		ABLIKIM	05G	BES2	$\psi(2S) \rightarrow \gamma\chi_{c0}$
$3414.7 {}^{+0.7}_{-0.6} \pm 0.2$		[2] ANDREOTTI	03	E835	$\overline{p}p \rightarrow \chi_{c0} \rightarrow \pi^0\pi^0$
3415.5 ± 0.4 ±0.4	392	[3] BAGNASCO	02	E835	$\overline{p}p \rightarrow \chi_{c0} \rightarrow J/\psi\gamma$
$3417.4 {}^{+1.8}_{-1.9} \pm 0.2$		[2] AMBROGIANI	99B	E835	$\overline{p}p \rightarrow e^+e^-\gamma$
3414.1 ± 0.6 ±0.8		BAI	99B	BES	$\psi(2S) \rightarrow \gamma X$
3417.8 ± 0.4 ±4		[2] GAISER	86	CBAL	$\psi(2S) \rightarrow \gamma X$
3416 ± 3 ±4		[4] TANENBAUM	78	MRK1	e^+e^-
• • • We do not use the following data for averages, fits, limits, etc. • • •					
3416.5 ± 3.0		EISENSTEIN	01	CLE2	$e^+e^- \rightarrow e^+e^-\chi_{c0}$
3422 ±10		[4] BARTEL	78B	CNTR	$e^+e^- \rightarrow J/\psi 2\gamma$
3415 ± 9		[4] BIDDICK	77	CNTR	$e^+e^- \rightarrow \gamma X$

[1] From a fit of the J/ψ recoil mass spectrum. Supersedes ABE,K 02 and ABE 04G.
[2] Using mass of $\psi(2S) = 3686.0$ MeV.
[3] Recalculated by ANDREOTTI 05A, using the value of $\psi(2S)$ mass from AULCHENKO 03.
[4] Mass value shifted by us by amount appropriate for $\psi(2S)$ mass = 3686 MeV and $J/\psi(1S)$ mass = 3097 MeV.

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

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
10.4±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	$\psi(2S) \rightarrow \gamma\chi_{c0}$
$8.6 {}^{+1.7}_{-1.3} \pm 0.1$		ANDREOTTI	03	E835	$\overline{p}p \rightarrow \chi_{c0} \rightarrow \pi^0\pi^0$
9.7±1.0	392	[5] BAGNASCO	02	E835	$\overline{p}p \rightarrow \chi_{c0} \rightarrow J/\psi\gamma$
$16.6 {}^{+5.2}_{-3.7} \pm 0.1$		AMBROGIANI	99B	E835	$\overline{p}p \rightarrow e^+e^-\gamma$
14.3±2.0±3.0		BAI	98I	BES	$\psi(2S) \rightarrow \gamma\pi^+\pi^-$
13.5±3.3±4.2		GAISER	86	CBAL	$\psi(2S) \rightarrow \gamma X, \gamma\pi^0\pi^0$

[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	$f_0(980)f_0(980) \rightarrow 2\pi^+2\pi^-$	$(7.0 \pm2.2) \times 10^{-4}$	
Γ_3	$\pi^+\pi^-K^+K^-$	(2.0 ± 0.4) %	S=1.6
Γ_4	$f_0(980)f_0(980) \rightarrow \pi^+\pi^-K^+K^-$	$(1.7 {}^{+1.1}_{-0.9}) \times 10^{-4}$	
Γ_5	$f_0(980)f_0(2200) \rightarrow \pi^+\pi^-K^+K^-$	$(8.3 {}^{+2.1}_{-2.7}) \times 10^{-4}$	
Γ_6	$f_0(1370)f_0(1370) \rightarrow \pi^+\pi^-K^+K^-$	$< 2.9 \times 10^{-4}$	CL=90%
Γ_7	$f_0(1370)f_0(1500) \rightarrow \pi^+\pi^-K^+K^-$	$< 1.8 \times 10^{-4}$	CL=90%
Γ_8	$f_0(1370)f_0(1710) \rightarrow \pi^+\pi^-K^+K^-$	$(7.1 {}^{+3.7}_{-2.5}) \times 10^{-4}$	
Γ_9	$f_0(1500)f_0(1370) \rightarrow \pi^+\pi^-K^+K^-$	$< 1.4 \times 10^{-4}$	CL=90%
Γ_{10}	$f_0(1500)f_0(1500) \rightarrow \pi^+\pi^-K^+K^-$	$< 5 \times 10^{-5}$	CL=90%
Γ_{11}	$f_0(1500)f_0(1710) \rightarrow \pi^+\pi^-K^+K^-$	$< 7 \times 10^{-5}$	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. $\rightarrow \pi^+\pi^-K^+K^-$	$(6.6 \pm2.0) \times 10^{-3}$	
Γ_{16}	$K_1(1400)^+K^- +$ c.c. $\rightarrow \pi^+\pi^-K^+K^-$	$< 2.8 \times 10^{-3}$	CL=90%
Γ_{17}	$K^*(892)^0\overline{K}^*(892)^0$	$(1.8 \pm0.6) \times 10^{-3}$	
Γ_{18}	$K_0^*(1430)^0\overline{K}_0^*(1430)^0 \rightarrow \pi^+\pi^-K^+K^-$	$(1.04 {}^{+0.38}_{-0.30}) \times 10^{-3}$	
Γ_{19}	$K_0^*(1430)^0\overline{K}_2^*(1430)^0 +$ c.c. $\rightarrow \pi^+\pi^-K^+K^-$	$(8.4 {}^{+2.1}_{-2.6}) \times 10^{-4}$	
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

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

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

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 ± 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.

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

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

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	$e^+e^- \to e^+e^-\chi_{c0}$

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

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	$e^+e^- \to e^+e^-\chi_{c0}$

[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

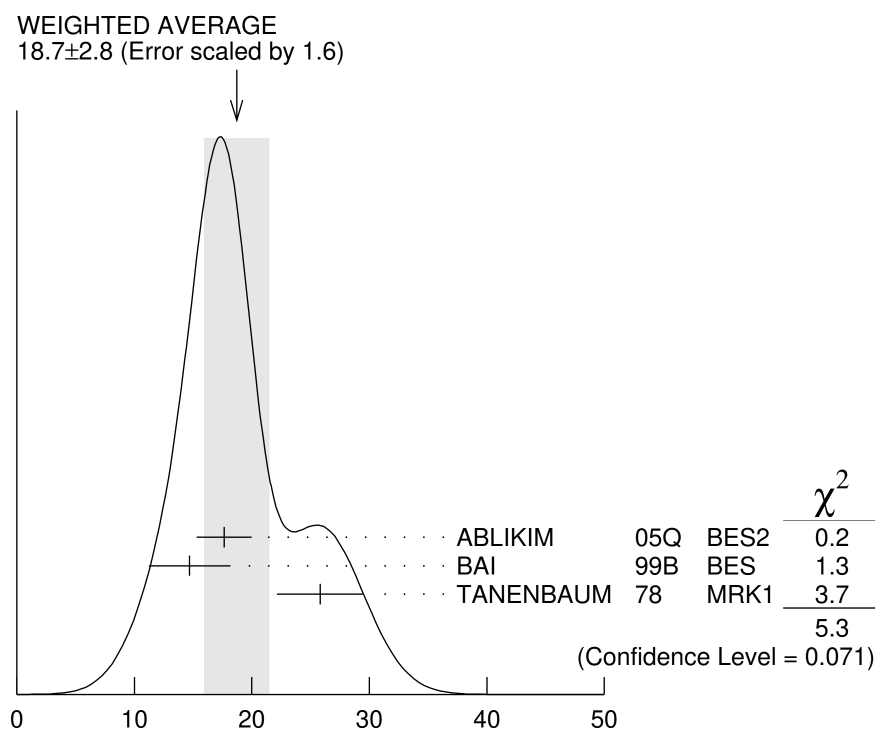
VALUE	DOCUMENT ID
0.0243±0.0023 OUR FIT	

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

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

$\Gamma(\pi^+\pi^-K^+K^-)/\Gamma_{total}$ — 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	$\psi(2S) \to \gamma\pi^+\pi^-K^+K^-$
14.7±0.7±3.4	[11] BAI	99B	BES	$\psi(2S) \to \gamma\chi_{c0}$
25.8±3.5±1.1	[11] TANENBAUM	78	MRK1	$\psi(2S) \to \gamma\chi_{c0}$



$\Gamma(\pi^+\pi^-K^+K^-)/\Gamma_{total}$ — 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*
$17.^{+11.}_{-\ 9.}\pm 1.$	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*
$8.3^{+2.1}_{-2.6}\pm 0.4$	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*
$7.1^{+3.7}_{-2.5}\pm 0.3$	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	$\psi(2S) \to \gamma\chi_{c0}$

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

VALUE	DOCUMENT ID		TECN	COMMENT
0.012±0.004	[20] TANENBAUM	78	MRK1	$\psi(2S) \to \gamma \chi_{c0}$

$\Gamma(K_1(1270)^+ K^- + \text{c.c.} \to \pi^+ \pi^- K^+ K^-)/\Gamma_{\text{total}}$ — Γ_{15}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
6.6±2.0±0.3	68	[21] ABLIKIM	05Q	BES2	$\psi(2S) \to \gamma \pi^+ \pi^- K^+ K^-$

$\Gamma(K_1(1400)^+ K^- + \text{c.c.} \to \pi^+ \pi^- K^+ K^-)/\Gamma_{\text{total}}$ — Γ_{16}/Γ

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

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

$\Gamma(K_0^*(1430)^0 \overline{K}_0^*(1430)^0 \to \pi^+ \pi^- K^+ K^-)/\Gamma_{\text{total}}$ — Γ_{18}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
$10.4^{+3.8}_{-3.0}$±0.4	83	[26] ABLIKIM	05Q	BES2	$\psi(2S) \to \gamma \pi^+ \pi^- K^+ K^-$

$\Gamma(K_0^*(1430)^0 \overline{K}_2^*(1430)^0 + \text{c.c.} \to \pi^+ \pi^- K^+ K^-)/\Gamma_{\text{total}}$ — Γ_{19}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
$8.4^{+2.1}_{-2.5}$±0.4	62	[27] ABLIKIM	05Q	BES2	$\psi(2S) \to \gamma \pi^+ \pi^- K^+ K^-$

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

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

$\Gamma(\eta\eta)/\Gamma_{\text{total}}$ — 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	$\psi(2S) \to \gamma h^+ h^- h^0$

$\Gamma(K^0 K^+\pi^- + \text{c.c.})/\Gamma_{total}$ — 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	$\psi(2S) \to \gamma h^+ h^- h^0$

$\Gamma(K^+K^-K^0_SK^0_S)/\Gamma_{total}$ 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	$\psi(2S) \to \gamma 2K^+ 2K^-$

$\Gamma(K^0_SK^0_S\pi^+\pi^-)/\Gamma_{total}$ 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	$\psi(2S) \to \gamma\chi_{c0}$

$\Gamma(K^0_SK^0_Sp\overline{p})/\Gamma_{total}$ 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	$\psi(2S) \to \chi_{c0}\gamma$

$\Gamma(K^+\overline{p}\Lambda+$ 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($\psi(2S) \rightarrow \gamma\chi_{c0}$)= (9.3 ± 0.4)% and B($\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-$) = (32.3 ± 0.5)%.

[12] ABLIKIM 05Q reports [B($\chi_{c0}(1P) \rightarrow f_0(980) f_0(980) \rightarrow \pi^+\pi^- K^+ K^-$) × B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$)] = $(1.59 \pm 0.50^{+0.89}_{-0.72}) \times 10^{-5}$. We divide by our best value B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = $(9.3 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. 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($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = $(9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$. 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. The f_0 mesons are identified via $f_0(980) \rightarrow \pi^+\pi^-$ and $f_0(2200) \rightarrow K^+K^-$ decays.

[14] ABLIKIM 05Q reports $< 2.9 \times 10^{-4}$ 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($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = 0.093. 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($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = $(9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$. We rescale to our best value B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = 0.093. The f_0 mesons are identified via $f_0(1370) \rightarrow \pi^+\pi^-$ and $f_0(1500) \rightarrow K^+K^-$ decays.

[16] ABLIKIM 05Q reports $(7.12 \pm 1.85^{+3.28}_{-1.68}) \times 10^{-4}$ 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. The f_0 mesons are identified via $f_0(1370) \rightarrow \pi^+\pi^-$ and $f_0(1710) \rightarrow K^+K^-$ decays.

[17] ABLIKIM 05Q reports $< 1.4 \times 10^{-4}$ 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($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = 0.093. The f_0 mesons are identified via $f_0(1500) \rightarrow \pi^+\pi^-$ and $f_0(1370) \rightarrow K^+K^-$ decays.

[18] 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($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = 0.093. 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($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = $(9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$. We rescale to our best value B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = 0.093. The f_0 mesons are identified via $f_0(1500) \rightarrow \pi^+\pi^-$ and $f_0(1710) \rightarrow K^+K^-$ decays.

[20] Calculated using B($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = 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($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = $(9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$. 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. The measurement assumes B($K_1(1270) \rightarrow K\rho(770)$) = 42 ± 6%.

[22] 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($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$) = 0.093. The measurement assumes B($K_1(1400) \rightarrow K^*(892)\pi$) = 94 ± 6%.

[23] 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($\psi(2S) \rightarrow \gamma\chi_{c0}(1P)$)

$= (9.3 \pm 0.4) \times 10^{-2}$. 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 ± 0.0011 ± 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 ± 0.0011 ± 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 $[B(\chi_{c0}(1P) \rightarrow K^0_S K^0_S \pi^+ \pi^-) \times B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))] = (0.558 \pm 0.051 \pm 0.089) \times 10^{-3}$. We divide by our best value $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.3 \pm 0.4) \times 10^{-2}$. 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 $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$. 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.

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

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

[46] ABLIKIM 06I reports $[B(\chi_{c0}(1P) \rightarrow p \overline{n} \pi^-) \times B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P))] = (1.10 \pm 0.24 \pm 0.18) \times 10^{-4}$. We divide by our best value $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.3 \pm 0.4) \times 10^{-2}$. 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 $B(\psi(2S) \rightarrow \gamma \chi_{c0}(1P)) = (9.22 \pm 0.11 \pm 0.46) \times 10^{-2}$. 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.

[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	$e^+ e^- \rightarrow \psi(2S) \rightarrow \gamma \chi_{c0}$

$\Gamma(\gamma\gamma)/\Gamma_{total}$ 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	$p\overline{p} \rightarrow \chi_{c0} \rightarrow \gamma\gamma$
1.45±0.74	[51] AMBROGIANI	00B	E835	$\overline{p} p \rightarrow \chi_{c2} \rightarrow \gamma\gamma, \gamma J/\psi$

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

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	$\overline{p} p \rightarrow \chi_{c0} \rightarrow J/\psi \gamma$
$29.3 ^{+5.7}_{-4.7} \pm 1.5$	89	[51,52] AMBROGIANI	99B		$\overline{p} p \rightarrow \chi_{c0} \rightarrow J/\psi \gamma$

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

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. • • •				
$6.52\pm1.18^{+0.48}_{-0.72}$	[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

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

VALUE (units 10^{-5})	DOCUMENT ID		TECN	COMMENT
6.0±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					
$23.6^{+3.7}_{-3.4}\pm3.4$	89.5^{+14}_{-13}	BAI	04F	BES	$\psi(2S) \to \gamma\chi_{c0}(1P) \to \gamma\overline{p}p$

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

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 ± 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	[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 ± 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	$\psi(2S) \to \gamma\eta\eta$

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

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	$\psi(2S) \to \gamma K^0_S K^0_S$

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

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].

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

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 $B(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.2 \pm 0.4)\%$.

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

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
7.8±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 $\mathrm{B}(\chi_{c0} \to 2K^+2K^-)$ reported by BAI 99B was derived using $\mathrm{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.3 \pm 0.8)\%$ and $\mathrm{B}(\psi(2S) \to J/\psi\pi^+\pi^-) = (32.4 \pm 2.6)\%$ [BAI 98D].

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

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 $\mathrm{B}(\chi_{c0} \to \phi\phi)$ reported by ABLIKIM 06T was derived using $\mathrm{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.2 \pm 0.4)\%$.

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

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
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 $\mathrm{B}(\chi_{c0} \to \phi\phi)$ reported by BAI 99B was derived using $\mathrm{B}(\psi(2S) \to \gamma\chi_{c0}(1P)) = (9.3 \pm 0.8)\%$ and $\mathrm{B}(\psi(2S) \to J/\psi\pi^+\pi^-) = (32.4 \pm 2.6)\%$ [BAI 98D].

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