$\chi_{c2}(1P)$

$I^G(J^{PC}) = 0^+(2^{++})$

See the Review on "$\psi(2S)$ and χ_c branching ratios" before the $\chi_{c0}(1P)$ Listings.

$\chi_{c2}(1P)$ MASS

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
3556.20 ± 0.09 OUR AVERAGE					
3555.70 ± 0.59 ±0.39		ABLIKIM	05G	BES2	$\psi(2S) \to \gamma\chi_{c2}$
3556.173± 0.123±0.020		ANDREOTTI	05A	E835	$p\overline{p} \to e^+e^-\gamma$
3559.9 ± 2.9		EISENSTEIN	01	CLE2	$e^+e^- \to e^+e^-\chi_{c2}$
3556.4 ± 0.7		BAI	99B	BES	$\psi(2S) \to \gamma X$
3556.22 ± 0.131±0.020	585	[1] ARMSTRONG	92	E760	$\overline{p}p \to e^+e^-\gamma$
3556.9 ± 0.4 ±0.5	50	BAGLIN	86B	SPEC	$\overline{p}p \to e^+e^-X$
3557.8 ± 0.2 ±4		[2] GAISER	86	CBAL	$\psi(2S) \to \gamma X$
3553.4 ± 2.2	66	[3] LEMOIGNE	82	GOLI	185 π^- Be $\to \gamma\mu^+\mu^-$ A
3555.9 ± 0.7		[4] OREGLIA	82	CBAL	$e^+e^- \to J/\psi 2\gamma$
3557 ± 1.5	69	[5] HIMEL	80	MRK2	$e^+e^- \to J/\psi 2\gamma$
3551 ±11	15	BRANDELIK	79B	DASP	$e^+e^- \to J/\psi 2\gamma$
3553 ± 4		[5] BARTEL	78B	CNTR	$e^+e^- \to J/\psi 2\gamma$
3553 ± 4 ±4		[5,6] TANENBAUM	78	MRK1	e^+e^-
3563 ± 7	360	[5] BIDDICK	77	CNTR	$e^+e^- \to \gamma X$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
3543 ±10	4	WHITAKER	76	MRK1	$e^+e^- \to J/\psi 2\gamma$

[1] Recalculated by ANDREOTTI 05A, using the value of $\psi(2S)$ mass from AULCHENKO 03.
[2] Using mass of $\psi(2S) = 3686.0$ MeV.
[3] $J/\psi(1S)$ mass constrained to 3097 MeV.
[4] Assuming $\psi(2S)$ mass = 3686 MeV and $J/\psi(1S)$ mass = 3097 MeV.
[5] Mass value shifted by us by amount appropriate for $\psi(2S)$ mass = 3686 MeV and $J/\psi(1S)$ mass = 3097 MeV.
[6] From a simultaneous fit to radiative and hadronic decay channels.

$\chi_{c2}(1P)$ WIDTH

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
2.05 ±0.12 OUR FIT					
1.95 ±0.13 OUR AVERAGE					
1.915±0.188±0.013		ANDREOTTI	05A	E835	$p\overline{p} \to e^+e^-\gamma$
1.96 ±0.17 ±0.07	585	[7] ARMSTRONG	92	E760	$\overline{p}p \to e^+e^-\gamma$
2.6 $^{+1.4}_{-1.0}$	50	BAGLIN	86B	SPEC	$\overline{p}p \to e^+e^-X$
2.8 $^{+2.1}_{-2.0}$		[8] GAISER	86	CBAL	$\psi(2S) \to \gamma X$

[7] Recalculated by ANDREOTTI 05A.
[8] Errors correspond to 90% confidence level; authors give only width range.

$\chi_{c2}(1P)$ DECAY MODES

	Mode	Fraction (Γ_i/Γ)	Scale factor/ Confidence level
	Hadronic decays		
Γ_1	$2(\pi^+\pi^-)$	(1.25±0.16) %	
Γ_2	$\pi^+\pi^- K^+ K^-$	(1.00±0.26) %	S=1.6
Γ_3	$3(\pi^+\pi^-)$	(8.7 ±1.8) $\times 10^{-3}$	
Γ_4	$K^+ \overline{K}^*(892)^0 \pi^- +$ c.c.	(4.8 ±2.8) $\times 10^{-3}$	
Γ_5	$K^*(892)^0 \overline{K}^*(892)^0$	(3.8 ±0.8) $\times 10^{-3}$	
Γ_6	$\phi\phi$	(1.8 ±0.4) $\times 10^{-3}$	
Γ_7	$\omega\omega$	(2.0 ±0.7) $\times 10^{-3}$	
Γ_8	$\pi\pi$	(2.17±0.25) $\times 10^{-3}$	
Γ_9	$\rho^0\pi^+\pi^-$	(7 ±4) $\times 10^{-3}$	
Γ_{10}	$\pi^+\pi^-\eta$	(5.6 ±1.5) $\times 10^{-4}$	
Γ_{11}	$\pi^+\pi^-\eta'$	(5.9 ±2.2) $\times 10^{-4}$	
Γ_{12}	$\eta\eta$	$<$ 5 $\times 10^{-4}$	CL=90%
Γ_{13}	$K^+ K^-$	(7.8 ±1.4) $\times 10^{-4}$	
Γ_{14}	$K^0_S K^0_S$	(6.8 ±1.1) $\times 10^{-4}$	
Γ_{15}	$K^0 K^+ \pi^- +$ c.c.	(1.0 ±0.4) $\times 10^{-3}$	S=2.6
Γ_{16}	$K^+ K^- \pi^0$	(3.6 ±0.9) $\times 10^{-4}$	
Γ_{17}	$K^+ K^- \eta$	$<$ 4 $\times 10^{-4}$	CL=90%
Γ_{18}	$\eta\pi^+\pi^-$	$<$ 1.7 $\times 10^{-3}$	CL=90%
Γ_{19}	$\eta\eta'$	$<$ 2.6 $\times 10^{-4}$	CL=90%
Γ_{20}	$\eta'\eta'$	$<$ 4 $\times 10^{-4}$	CL=90%
Γ_{21}	$\pi^+\pi^- K^0_S K^0_S$	(2.6 ±0.6) $\times 10^{-3}$	
Γ_{22}	$K^+ K^- K^0_S K^0_S$	$<$ 4 $\times 10^{-4}$	CL=90%
Γ_{23}	$K^+ K^- K^+ K^-$	(1.79±0.26) $\times 10^{-3}$	
Γ_{24}	$K^+ K^- \phi$	(1.67±0.35) $\times 10^{-3}$	
Γ_{25}	$K^0_S K^0_S p\overline{p}$	$<$ 7.9 $\times 10^{-4}$	CL=90%
Γ_{26}	$p\overline{p}$	(6.6 ±0.5) $\times 10^{-5}$	
Γ_{27}	$p\overline{p}\pi^0$	(5.1 ±1.1) $\times 10^{-4}$	
Γ_{28}	$p\overline{p}\eta$	(2.2 ±0.8) $\times 10^{-4}$	
Γ_{29}	$\pi^+\pi^- p\overline{p}$	(1.34±0.34) $\times 10^{-3}$	
Γ_{30}	$p\overline{n}\pi^-$	(1.2 ±0.4) $\times 10^{-3}$	
Γ_{31}	$\Lambda\overline{\Lambda}$	(2.8 ±1.3) $\times 10^{-4}$	
Γ_{32}	$\Lambda\overline{\Lambda}\pi^+\pi^-$	$<$ 3.5 $\times 10^{-3}$	CL=90%
Γ_{33}	$K^+\overline{p}\Lambda +$ c.c.	(9.8 ±1.9) $\times 10^{-4}$	
Γ_{34}	$\Xi^-\overline{\Xi}^+$	$<$ 3.7 $\times 10^{-4}$	CL=90%
Γ_{35}	$J/\psi(1S)\pi^+\pi^-\pi^0$	$<$ 1.5 %	CL=90%
	Radiative decays		
Γ_{36}	$\gamma J/\psi(1S)$	(20.3 ±1.0) %	
Γ_{37}	$\gamma\gamma$	(2.58±0.19) $\times 10^{-4}$	

$\chi_{c2}(1P)$ PARTIAL WIDTHS

$\chi_{c2}(1P)$ $\Gamma(i)\Gamma(\gamma J/\psi(1S))/\Gamma(\text{total})$

$\Gamma(p\overline{p}) \times \Gamma(\gamma J/\psi(1S))/\Gamma_{\text{total}}$ — $\Gamma_{26}\Gamma_{36}/\Gamma$

VALUE (eV)	DOCUMENT ID		TECN	COMMENT
27.4±1.4 OUR FIT				
27.5±1.5 OUR AVERAGE				
27.0±1.5±1.1	[9] ANDREOTTI	05A	E835	$p\overline{p} \to e^+e^-\gamma$
27.7±1.5±2.0	[9,10] ARMSTRONG	92	E760	$\overline{p}p \to e^+e^-\gamma$
36 ±8	[9] BAGLIN	86B	SPEC	$\overline{p}p \to e^+e^-X$

$\Gamma(\gamma\gamma) \times \Gamma(\gamma J/\psi(1S))/\Gamma_{\text{total}}$ — $\Gamma_{37}\Gamma_{36}/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID		TECN	COMMENT
108± 8 OUR FIT					
117± 10 OUR AVERAGE					
111± 12± 9	147 ± 15	[11] DOBBS	06	CLE3	10.4 $e^+e^- \to e^+e^-\chi_{c2}$
114± 11± 9	136 ± 13.3	[11,12] ABE	02T	BELL	$e^+e^- \to e^+e^-\chi_{c2}$
139± 55± 21		[11,13] ACCIARRI	99E	L3	$e^+e^- \to e^+e^-\chi_{c2}$
242± 65± 51		[11,14] ACKER..,K...	98	OPAL	$e^+e^- \to e^+e^-\chi_{c2}$
150± 42± 36		[11,15] DOMINICK	94	CLE2	$e^+e^- \to e^+e^-\chi_{c2}$
470±240±120		[11,16] BAUER	93	TPC	$e^+e^- \to e^+e^-\chi_{c2}$

[9] Calculated by us using $B(J/\psi(1S) \to e^+e^-) = 0.0593 \pm 0.0010$.
[10] Recalculated by ANDREOTTI 05A.
[11] Calculated by us using $B(J/\psi \to \ell^+\ell^-) = 0.1187 \pm 0.0008$.
[12] All systematic errors added in quadrature.
[13] The value for $\Gamma(\chi_{c2} \to \gamma\gamma)$ reported in ACCIARRI 99E is derived using $B(\chi_{c2} \to \gamma J/\psi(1S)) \times B(J/\psi(1S) \to \ell^+\ell^-) = 0.0162 \pm 0.0014$.
[14] The value for $\Gamma(\chi_{c2} \to \gamma\gamma)$ reported in ACKERSTAFF,K 98 is derived using $B(\chi_{c2} \to \gamma J/\psi(1S)) = 0.135 \pm 0.011$ and $B(J/\psi(1S) \to \ell^+\ell^-) = 0.1203 \pm 0.0038$.
[15] The value for $\Gamma(\chi_{c2} \to \gamma\gamma)$ reported in DOMINICK 94 is derived using $B(\chi_{c2} \to \gamma J/\psi(1S)) = 0.135 \pm 0.011$, $B(J/\psi(1S) \to e^+e^-) = 0.0627 \pm 0.0020$, and $B(J/\psi(1S) \to \mu^+\mu^-) = 0.0597 \pm 0.0025$.
[16] The value for $\Gamma(\chi_{c2} \to \gamma\gamma)$ reported in BAUER 93 is derived using $B(\chi_{c2} \to \gamma J/\psi(1S)) = 0.135 \pm 0.011$, $B(J/\psi(1S) \to e^+e^-) = 0.0627 \pm 0.0020$, and $B(J/\psi(1S) \to \mu^+\mu^-) = 0.0597 \pm 0.0025$.

$\chi_{c2}(1P)$ $\Gamma(i)\Gamma(\gamma\gamma)/\Gamma(\text{total})$

$\Gamma(2(\pi^+\pi^-)) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ — $\Gamma_{1}\Gamma_{37}/\Gamma$

VALUE (eV)	DOCUMENT ID		TECN	COMMENT
6.6±0.9 OUR FIT				
6.4±1.8±0.8	EISENSTEIN	01	CLE2	$e^+e^- \to e^+e^-\chi_{c2}$

$\Gamma(\pi\pi) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ — $\Gamma_{8}\Gamma_{37}/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID		TECN	COMMENT
1.15±0.12 OUR FIT					
1.14±0.21±0.17	54 ± 10	[17] NAKAZAWA	05	BELL	$e^+e^- \to e^+e^-\chi_{c2}$

$\Gamma(K^+K^-) \times \Gamma(\gamma\gamma)/\Gamma_{total}$ $\Gamma_{13}\Gamma_{37}/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID		TECN	COMMENT
0.41±0.05 OUR FIT					
0.44±0.11±0.07	33 ± 8	NAKAZAWA	05	BELL	$e^+e^- \to e^+e^-\chi_{c2}$

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

$\chi_{c2}(1P)$ BRANCHING RATIOS

HADRONIC DECAYS

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

VALUE	DOCUMENT ID
0.0125±0.0016 OUR FIT	

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

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
10.0±2.6 OUR EVALUATION Error includes scale factor of 1.6. Treating systematic error as correlated.				
10.0±3.5 OUR AVERAGE Error includes scale factor of 2.2.				
7.6±0.6±1.8	[18] BAI	99B	BES	$\psi(2S) \to \gamma\chi_{c2}$
15.2±2.7±0.8	[18] TANENBAUM	78	MRK1	$\psi(2S) \to \gamma\chi_{c2}$

$\Gamma(3(\pi^+\pi^-))/\Gamma_{total}$ Γ_3/Γ

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
8.7±1.8 OUR EVALUATION Treating systematic error as correlated.				
8.7±1.8 OUR AVERAGE				
8.7±1.0±1.6	[18] BAI	99B	BES	$\psi(2S) \to \gamma\chi_{c2}$
8.8±6.0±0.5	[18] TANENBAUM	78	MRK1	$\psi(2S) \to \gamma\chi_{c2}$

$\Gamma(K^+\overline{K}^*(892)^0\pi^- + \text{c.c.})/\Gamma_{total}$ Γ_4/Γ

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
48±28	[19] TANENBAUM	78	MRK1	$\psi(2S) \to \gamma\chi_{c2}$

$\Gamma(K^*(892)^0\overline{K}^*(892)^0)/\Gamma_{total}$ Γ_5/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
3.8±0.7±0.2	57.5 ± 6.4	[20,21] ABLIKIM	04H	BES	$\psi(2S) \to \gamma K^+K^-\pi^+\pi^-$

$\Gamma(\phi\phi)/\Gamma_{total}$ Γ_6/Γ

VALUE (units 10^{-3})	DOCUMENT ID
1.8±0.4 OUR FIT	

$\Gamma(\omega\omega)/\Gamma_{total}$ Γ_7/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
2.0±0.7±0.1	27.7 ± 7.4	[22] ABLIKIM	05N	BES2	$\psi(2S) \to \gamma\chi_{c2} \to \gamma 6\pi$

$\Gamma(\pi\pi)/\Gamma_{total}$ Γ_8/Γ

VALUE (units 10^{-3})	DOCUMENT ID
2.17±0.25 OUR FIT	

$\Gamma(\rho^0\pi^+\pi^-)/\Gamma_{total}$ — Γ_9/Γ

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
68±40	[19] TANENBAUM	78	MRK1	$\psi(2S) \to \gamma\chi_{c2}$

$\Gamma(\pi^+\pi^-\eta)/\Gamma_{total}$ — Γ_{10}/Γ

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
0.56±0.15±0.03	[23] ATHAR	07	CLEO	$\psi(2S) \to \gamma h^+ h^- h^0$

$\Gamma(\pi^+\pi^-\eta')/\Gamma_{total}$ — Γ_{11}/Γ

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
0.59±0.21±0.03	[24] ATHAR	07	CLEO	$\psi(2S) \to \gamma h^+ h^- h^0$

$\Gamma(\eta\eta)/\Gamma_{total}$ — Γ_{12}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
< 5	90	[25] ADAMS	07	CLEO	$\psi(2S) \to \gamma\chi_{c2}$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<12	90	[18] BAI	03C	BES	$\psi(2S) \to \gamma\eta\eta \to 5\gamma$
7.9±4.1±2.4		[26] LEE	85	CBAL	$\psi' \to$ photons

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

VALUE (units 10^{-3})	DOCUMENT ID
0.78±0.14 OUR FIT	

$\Gamma(K^0_S K^0_S)/\Gamma_{total}$ — Γ_{14}/Γ

VALUE (units 10^{-3})	DOCUMENT ID
0.68±0.11 OUR FIT	

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

VALUE (units 10^{-3})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
1.0 ±0.4 OUR AVERAGE Error includes scale factor of 2.6.						
1.50±0.24±0.07			[27] ATHAR	07	CLEO	$\psi(2S) \to \gamma h^+ h^- h^0$
0.60±0.22±0.03		28	[28] ABLIKIM	06R	BES2	$\psi(2S) \to \gamma\chi_{c2}$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<2.0	90		[18] BAI	99B	BES	$\psi(2S) \to \gamma\chi_{c2}$

$\Gamma(K^+K^-\pi^0)/\Gamma_{total}$ — Γ_{16}/Γ

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
0.36±0.09±0.02	[29] ATHAR	07	CLEO	$\psi(2S) \to \gamma h^+ h^- h^0$

$\Gamma(K^+K^-\eta)/\Gamma_{total}$ — Γ_{17}/Γ

VALUE (units 10^{-3})	CL%	DOCUMENT ID		TECN	COMMENT
<0.4	90	[30] ATHAR	07	CLEO	$\psi(2S) \to \gamma h^+ h^- h^0$

$\Gamma(\eta\pi^+\pi^-)/\Gamma_{total}$ — Γ_{18}/Γ

VALUE (units 10^{-3})	CL%	DOCUMENT ID		TECN	COMMENT
<1.7	90	[31] ABLIKIM	06R	BES2	$\psi(2S) \to \gamma\chi_{c2}$

$\Gamma(\eta\eta')/\Gamma_{total}$ — Γ_{19}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<2.6	90	[32] ADAMS	07	CLEO	$\psi(2S) \to \gamma\chi_{c2}$

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

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<4	90	[33] ADAMS	07	CLEO	$\psi(2S) \to \gamma\chi_{c2}$

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

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
2.6±0.6±0.1	57 ± 11	[34] ABLIKIM	05O	BES2	$\psi(2S) \to \gamma\chi_{c2}$

$\Gamma(K^+K^- K^0_S K^0_S)/\Gamma_{total}$ — Γ_{22}/Γ

VALUE (units 10^{-4})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
<4	90	2.3 ± 2.2	[35] ABLIKIM	05O	BES2	$e^+e^- \to \chi_{c2}\gamma$

$\Gamma(K^+K^-K^+K^-)/\Gamma_{total}$ — Γ_{23}/Γ

VALUE (units 10^{-3})	DOCUMENT ID
1.79±0.26 OUR FIT	

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

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
1.67±0.34±0.08	52	[36] ABLIKIM	06T	BES2	$\psi(2S) \to \gamma 2K^+ 2K^-$

$\Gamma(K^0_S K^0_S p\overline{p})/\Gamma_{total}$ — Γ_{25}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<7.9	90	[37] ABLIKIM	06D	BES2	$\psi(2S) \to \chi_{c2}\gamma$

$\Gamma(p\overline{p})/\Gamma_{total}$ — Γ_{26}/Γ

VALUE (units 10^{-4})	DOCUMENT ID
0.66±0.05 OUR FIT	

$\Gamma(p\overline{p}\pi^0)/\Gamma_{total}$ — Γ_{27}/Γ

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
0.51±0.10±0.03	[38] ATHAR	07	CLEO	$\psi(2S) \to \gamma h^+ h^- h^0$

$\Gamma(p\overline{p}\eta)/\Gamma_{total}$ — Γ_{28}/Γ

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
0.22±0.08±0.01	[39] ATHAR	07	CLEO	$\psi(2S) \to \gamma h^+ h^- h^0$

$\Gamma(\pi^+\pi^- p\overline{p})/\Gamma_{total}$ — Γ_{29}/Γ

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
1.34±0.34 OUR EVALUATION	Treating systematic error as correlated.			
1.3 ±0.5 OUR AVERAGE	Error includes scale factor of 1.4.			
1.18±0.19±0.31	[18] BAI	99B	BES	$\psi(2S) \to \gamma\chi_{c2}$
2.68±1.04±0.14	[18] TANENBAUM	78	MRK1	$\psi(2S) \to \gamma\chi_{c2}$

$\Gamma(p\overline{n}\pi^-)/\Gamma_{total}$ Γ_{30}/Γ

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
12.±4.±1.	[40] ABLIKIM	06I	BES2	$\psi(2S) \to \gamma p \pi^- X$

$\Gamma(\Lambda\overline{\Lambda})/\Gamma_{total}$ Γ_{31}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
2.8±1.2±0.5	$8.3^{+3.7}_{-3.4}$	[18] BAI	03E	BES	$\psi(2S) \to \gamma\chi_{c2} \to \gamma\Lambda\overline{\Lambda}$

$\Gamma(\Lambda\overline{\Lambda}\pi^+\pi^-)/\Gamma_{total}$ Γ_{32}/Γ

VALUE (units 10^{-3})	CL%	DOCUMENT ID		TECN	COMMENT
<3.5	90	[37] ABLIKIM	06D	BES2	$\psi(2S) \to \chi_{c2}\gamma$

$\Gamma(K^+\overline{p}\Lambda + \text{c.c.})/\Gamma_{total}$ Γ_{33}/Γ

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
0.98±0.19±0.05	[41] ATHAR	07	CLEO	$\psi(2S) \to \gamma h^+ h^- h^0$

$\Gamma(\Xi^-\overline{\Xi}^+)/\Gamma_{total}$ Γ_{34}/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<3.7	90	[37] ABLIKIM	06D	BES2	$\psi(2S) \to \chi_{c2}\gamma$

$\Gamma(J/\psi(1S)\pi^+\pi^-\pi^0)/\Gamma_{total}$ Γ_{35}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.015	90	BARATE	81	SPEC	190 GeV π^- Be $\to 2\pi 2\mu$

[18] Rescaled by us using B($\psi(2S) \to \gamma\chi_{c2}$)= (8.1 ± 0.4)% and B($\psi(2S) \to J/\psi(1S)\pi^+\pi^-$) = (32.3 ± 0.5)%. Multiplied by a factor of 2 to convert from $K^0_S K^+\pi^-$ to $K^0 K^+\pi^-$ decay.

[19] Estimated using B($\psi(2S) \to \gamma\chi_{c2}(1P)$) = 0.078; the errors do not contain the uncertainty in the $\psi(2S)$ decay.

[20] ABLIKIM 04H reports [B($\chi_{c2}(1P) \to K^*(892)^0 \overline{K}^*(892)^0$) × B($\psi(2S) \to \gamma\chi_{c2}(1P)$)] = $(3.11 \pm 0.36 \pm 0.48) \times 10^{-4}$. We divide by our best value B($\psi(2S) \to \gamma\chi_{c2}(1P)$) = $(8.1 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

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

[22] ABLIKIM 05N reports [B($\chi_{c2}(1P) \to \omega\omega$) × B($\psi(2S) \to \gamma\chi_{c2}(1P)$)] = $(0.165 \pm 0.044 \pm 0.032) \times 10^{-3}$. We divide by our best value B($\psi(2S) \to \gamma\chi_{c2}(1P)$) = $(8.1 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[23] ATHAR 07 reports $(0.49 \pm 0.12 \pm 0.06) \times 10^{-3}$ for B($\psi(2S) \to \gamma\chi_{c2}(1P)$) = $(9.33 \pm 0.14 \pm 0.61) \times 10^{-2}$. We rescale to our best value B($\psi(2S) \to \gamma\chi_{c2}(1P)$) = $(8.1 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[24] ATHAR 07 reports $(0.51 \pm 0.18 \pm 0.06) \times 10^{-3}$ for B($\psi(2S) \to \gamma\chi_{c2}(1P)$) = $(9.33 \pm 0.14 \pm 0.61) \times 10^{-2}$. We rescale to our best value B($\psi(2S) \to \gamma\chi_{c2}(1P)$) = $(8.1 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[25] ADAMS 07 reports $< 4.7 \times 10^{-4}$ for B($\psi(2S) \to \gamma\chi_{c2}(1P)$) = 0.0933 ± 0.0014 ± 0.0061. We rescale to our best value B($\psi(2S) \to \gamma\chi_{c2}(1P)$) = 0.081.

[26] Calculated using B($\psi(2S) \to \gamma\chi_{c2}(1P)$) = 0.078 ± 0.008.

[27] ATHAR 07 reports $(1.3 \pm 0.2 \pm 0.1) \times 10^{-3}$ for B($\psi(2S) \to \gamma\chi_{c2}(1P)$) = $(9.33 \pm 0.14 \pm 0.61) \times 10^{-2}$. We rescale to our best value B($\psi(2S) \to \gamma\chi_{c2}(1P)$) = $(8.1 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[28] ABLIKIM 06R reports $(0.6 \pm 0.2 \pm 0.1) \times 10^{-3}$ for B($\psi(2S) \to \gamma\chi_{c2}(1P)$) = $(8.1 \pm 0.4) \times 10^{-2}$. We rescale to our best value B($\psi(2S) \to \gamma\chi_{c2}(1P)$) = $(8.1 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[29] ATHAR 07 reports $(0.31 \pm 0.07 \pm 0.04) \times 10^{-3}$ for B($\psi(2S) \to \gamma\chi_{c2}(1P)$) = $(9.33 \pm 0.14 \pm 0.61) \times 10^{-2}$. We rescale to our best value B($\psi(2S) \to \gamma\chi_{c2}(1P)$) = $(8.1 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[30] ATHAR 07 reports $< 0.33 \times 10^{-3}$ for B($\psi(2S) \to \gamma\chi_{c2}(1P)$) = $(9.33 \pm 0.14 \pm 0.61) \times 10^{-2}$. We rescale to our best value B($\psi(2S) \to \gamma\chi_{c2}(1P)$) = 0.081.

[31] ABLIKIM 06R reports $< 1.7 \times 10^{-3}$ for B($\psi(2S) \to \gamma\chi_{c2}(1P)$) = $(8.1 \pm 0.4) \times 10^{-2}$. We rescale to our best value B($\psi(2S) \to \gamma\chi_{c2}(1P)$) = 0.081.

[32] ADAMS 07 reports $< 2.3 \times 10^{-4}$ for B($\psi(2S) \to \gamma\chi_{c2}(1P)$) = 0.0933 ± 0.0014 ± 0.0061. We rescale to our best value B($\psi(2S) \to \gamma\chi_{c2}(1P)$) = 0.081.

[33] ADAMS 07 reports $< 3.1 \times 10^{-4}$ for B($\psi(2S) \to \gamma\chi_{c2}(1P)$) = 0.0933 ± 0.0014 ± 0.0061. We rescale to our best value B($\psi(2S) \to \gamma\chi_{c2}(1P)$) = 0.081.

[34] ABLIKIM 05O reports [B($\chi_{c2}(1P) \to \pi^+\pi^- K^0_S K^0_S$) × B($\psi(2S) \to \gamma\chi_{c2}(1P)$)] = $(0.207 \pm 0.039 \pm 0.033) \times 10^{-3}$. We divide by our best value B($\psi(2S) \to \gamma\chi_{c2}(1P)$) = $(8.1 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[35] ABLIKIM 05O reports [B($\chi_{c2}(1P) \to K^+K^- K^0_S K^0_S$) × B($\psi(2S) \to \gamma\chi_{c2}(1P)$)] = $< 3.5 \times 10^{-5}$. We divide by our best value B($\psi(2S) \to \gamma\chi_{c2}(1P)$) = 0.081.

[36] ABLIKIM 06T reports $(1.67 \pm 0.26 \pm 0.24) \times 10^{-3}$ for B($\psi(2S) \to \gamma\chi_{c2}(1P)$) = $(8.1 \pm 0.4) \times 10^{-2}$. We rescale to our best value B($\psi(2S) \to \gamma\chi_{c2}(1P)$) = $(8.1 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[37] Using B($\psi(2S) \to \chi_{c2}\gamma$) = (9.3 ± 0.6)%.

[38] ATHAR 07 reports $(0.44 \pm 0.08 \pm 0.05) \times 10^{-3}$ for B($\psi(2S) \to \gamma\chi_{c2}(1P)$) = $(9.33 \pm 0.14 \pm 0.61) \times 10^{-2}$. We rescale to our best value B($\psi(2S) \to \gamma\chi_{c2}(1P)$) = $(8.1 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[39] ATHAR 07 reports $(0.19 \pm 0.07 \pm 0.02) \times 10^{-3}$ for B($\psi(2S) \to \gamma\chi_{c2}(1P)$) = $(9.33 \pm 0.14 \pm 0.61) \times 10^{-2}$. We rescale to our best value B($\psi(2S) \to \gamma\chi_{c2}(1P)$) = $(8.1 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[40] ABLIKIM 06I reports [B($\chi_{c2}(1P) \to p\overline{n}\pi^-$) × B($\psi(2S) \to \gamma\chi_{c2}(1P)$)] = $(0.97 \pm 0.20 \pm 0.26) \times 10^{-4}$. We divide by our best value B($\psi(2S) \to \gamma\chi_{c2}(1P)$) = $(8.1 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

[41] ATHAR 07 reports $(0.85 \pm 0.14 \pm 0.10) \times 10^{-3}$ for B($\psi(2S) \to \gamma\chi_{c2}(1P)$) = $(9.33 \pm 0.14 \pm 0.61) \times 10^{-2}$. We rescale to our best value B($\psi(2S) \to \gamma\chi_{c2}(1P)$) = $(8.1 \pm 0.4) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

RADIATIVE DECAYS

$\Gamma(\gamma J/\psi(1S))/\Gamma_{total}$ — Γ_{36}/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
0.203±0.010 OUR FIT			
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.199±0.005±0.012	[42] ADAM 05A	CLEO	$e^+e^- \to \psi(2S) \to \gamma\chi_{c2}$

$\Gamma(\gamma\gamma)/\Gamma_{total}$ — Γ_{37}/Γ

VALUE (units 10^{-4})	DOCUMENT ID
2.58±0.19 OUR FIT	

$\Gamma(\gamma\gamma)/\Gamma(\gamma J/\psi(1S))$ — Γ_{37}/Γ_{36}

VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
1.27±0.11 OUR FIT			
0.99±0.18	[43] AMBROGIANI 00B	E835	$\overline{p}p \to \chi_{c2} \to \gamma\gamma, \gamma J/\psi$

$\Gamma(\gamma\gamma) \times \Gamma(p\overline{p})/\Gamma^2_{total}$ — $\Gamma_{37}\Gamma_{26}/\Gamma^2$

VALUE (units 10^{-8})	DOCUMENT ID	TECN	COMMENT
1.70±0.20 OUR FIT			
1.7 ±0.4 OUR AVERAGE			
1.60±0.42	ARMSTRONG 93	E760	$\overline{p}p \to \gamma\gamma X$
9.9 ±4.5	BAGLIN 87B	SPEC	$\overline{p}p \to \gamma\gamma X$

[42] Uses $B(\psi(2S) \to \gamma\chi_{c2} \to \gamma\gamma J/\psi)$ from ADAM 05A and $B(\psi(2S) \to \gamma\chi_{c2})$ from ATHAR 04.

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

$\chi_{c2}(1P)$ CROSS-PARTICLE BRANCHING RATIOS

$B(\chi_{c2}(1P) \to p\overline{p}) \times \frac{\Gamma(\psi(2S) \to \gamma\chi_{c2}(1P))}{\Gamma(\psi(2S) \to J/\psi(1S)\pi^+\pi^-)}$

VALUE (units 10^{-5})	DOCUMENT ID	TECN	COMMENT
1.64±0.17 OUR FIT			
1.4 ±1.1	[44] BAI 98I	BES	$\psi(2S) \to \gamma\chi_{c2} \to \gamma\overline{p}p$

$B(\chi_{c2}(1P) \to p\overline{p}) \times B(\psi(2S) \to \gamma\chi_{c2}(1P))$

VALUE (units 10^{-6})	EVTS	DOCUMENT ID	TECN	COMMENT
5.3±0.5 OUR FIT				
$\mathbf{4.4^{+1.6}_{-1.4}\pm0.6}$	$14.3^{+5.2}_{-4.7}$	BAI 04F	BES	$\psi(2S) \to \gamma\chi_{c2}(1P) \to \gamma\overline{p}p$

$B(\chi_{c2}(1P) \to K^+K^-) \times \frac{\Gamma(\psi(2S) \to \gamma\chi_{c2}(1P))}{\Gamma(\psi(2S) \to J/\psi(1S)\pi^+\pi^-)}$

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
0.195±0.017 OUR FIT				
0.190±0.034±0.019	115 ± 13	[45] BAI 98I	BES	$\psi(2S) \to \gamma K^+K^-$

$B(\chi_{c2}(1P) \to K^0_S K^0_S) \times B(\psi(2S) \to \gamma\chi_{c2}(1P))$

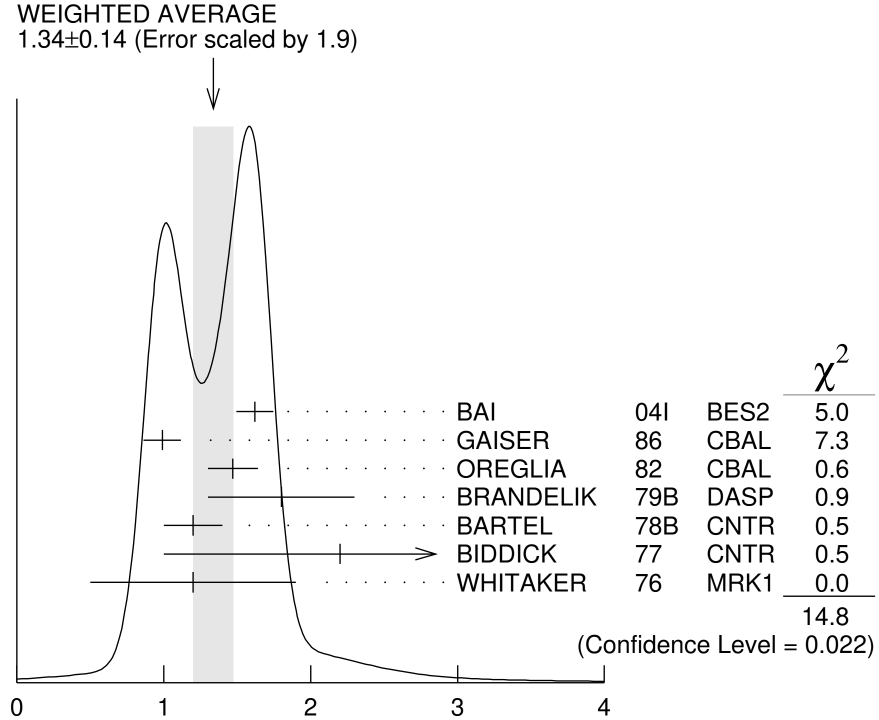
VALUE (units 10^{-5})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
5.5 ±0.9 OUR FIT					
5.72±0.76±0.63	65	ABLIKIM	05O	BES2	$\psi(2S) \to \gamma K^0_S K^0_S$

$B(\chi_{c2}(1P) \to K^0_S K^0_S) \times \frac{\Gamma(\psi(2S) \to \gamma\chi_{c2}(1P))}{\Gamma(\psi(2S) \to J/\psi(1S)\pi^+\pi^-)}$

VALUE (units 10^{-5})	*DOCUMENT ID*		*TECN*	*COMMENT*
16.9±1.5 OUR FIT				
14.7±4.1±3.3	[46] BAI	99B	BES	$\psi(2S) \to \gamma K^0_S K^0_S$

$B(\chi_{c2}(1P) \to \gamma J/\psi(1S)) \times B(\psi(2S) \to \gamma\chi_{c2}(1P))$

VALUE (units 10^{-2})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
1.64±0.04 OUR FIT					
1.34±0.14 OUR AVERAGE Error includes scale factor of 1.9. See the ideogram below.					
1.62±0.04±0.12	5.8k	BAI	04I	BES2	$\psi(2S) \to J/\psi\gamma\gamma$
0.99±0.10±0.08		GAISER	86	CBAL	$\psi(2S) \to \gamma X$
1.47±0.17		[47] OREGLIA	82	CBAL	$\psi(2S) \to \gamma\chi_{c2}$
1.8 ±0.5		[48] BRANDELIK	79B	DASP	$\psi(2S) \to \gamma\chi_{c2}$
1.2 ±0.2		[48] BARTEL	78B	CNTR	$\psi(2S) \to \gamma\chi_{c2}$
2.2 ±1.2		[49] BIDDICK	77	CNTR	$e^+e^- \to \gamma X$
1.2 ±0.7		[47] WHITAKER	76	MRK1	e^+e^-
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1.85±0.04±0.07	1.9k	[50] ADAM	05A	CLEO	$\psi(2S) \to J/\psi\gamma\gamma$



$B(\chi_{c2}(1P) \rightarrow \gamma J/\psi(1S)) \times B(\psi(2S) \rightarrow \gamma \chi_{c2}(1P))$

$B(\chi_{c2}(1P) \rightarrow \gamma J/\psi) \times \frac{\Gamma(\psi(2S) \rightarrow \gamma \chi_{c2}(1P))}{\Gamma(\psi(2S) \rightarrow J/\psi(1S) anything)}$

VALUE (units 10^{-2})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
2.88±0.05 OUR FIT					
3.11±0.07±0.07	1.9k	ADAM	05A	CLEO	$\psi(2S) \rightarrow J/\psi \gamma \gamma$

$B(\chi_{c2}(1P) \rightarrow \gamma J/\psi(1S)) \times \frac{\Gamma(\psi(2S) \rightarrow \gamma \chi_{c2}(1P))}{\Gamma(\psi(2S) \rightarrow J/\psi(1S) \pi^+ \pi^-)}$

VALUE (units 10^{-2})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
5.08±0.18 OUR FIT					
4.2 ±1.1 OUR AVERAGE					
6.0 ±2.8	1.3k	[51] ABLIKIM	04B	BES	$\psi(2S) \rightarrow J/\psi X$
3.9 ±1.2		[52] HIMEL	80	MRK2	$\psi(2S) \rightarrow \gamma \chi_{c2}$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
5.52±0.13±0.13	1.9k	[50] ADAM	05A	CLEO	$\psi(2S) \rightarrow J/\psi \gamma \gamma$

$B(\chi_{c2}(1P) \rightarrow \gamma\gamma) \times B(\psi(2S) \rightarrow \gamma \chi_{c2}(1P))$

VALUE (units 10^{-5})	*DOCUMENT ID*		*TECN*	*COMMENT*
2.09±0.19 OUR FIT				
7.0 ±2.1 ±2.0	LEE	85	CBAL	$\psi(2S) \rightarrow \gamma \chi_{c2}$

$B(\chi_{c2}(1P) \to \pi\pi) \times \frac{\Gamma(\psi(2S) \to \gamma\chi_{c2}(1P))}{\Gamma(\psi(2S) \to J/\psi(1S)\pi^+\pi^-)}$

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
0.54±0.05 OUR FIT					
0.54±0.06 OUR AVERAGE					
0.66±0.18±0.37	21 ± 6	[53] BAI	03C	BES	$\psi(2S) \to \gamma\pi^0\pi^0$
0.54±0.05±0.04	185 ± 16	[54] BAI	98I	BES	$\psi(2S) \to \gamma\pi^+\pi^-$

$B(\chi_{c2}(1P) \to 2(\pi^+\pi^-)) \times \frac{\Gamma(\psi(2S) \to \gamma\chi_{c2}(1P))}{\Gamma(\psi(2S) \to J/\psi(1S)\pi^+\pi^-)}$

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
3.1±0.4 OUR FIT				
3.1±1.0 OUR AVERAGE Error includes scale factor of 2.5.				
2.3±0.1±0.5	[55] BAI	99B	BES	$\psi(2S) \to \gamma\chi_{c2}$
4.3±0.6	[56] TANENBAUM	78	MRK1	$\psi(2S) \to \gamma\chi_{c2}$

$B(\chi_{c2}(1P) \to K^+K^-K^+K^-) \times B(\psi(2S) \to \gamma\chi_{c2}(1P))$

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
1.45±0.20 OUR FIT					
1.76±0.16±0.24	160	[57] ABLIKIM	06T	BES2	$\psi(2S) \to \gamma 2K^+2K^-$

$B(\chi_{c2}(1P) \to K^+K^-K^+K^-) \times \frac{\Gamma(\psi(2S) \to \gamma\chi_{c2}(1P))}{\Gamma(\psi(2S) \to J/\psi(1S)\pi^+\pi^-)}$

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
4.5±0.4 OUR FIT				
3.6±0.6±0.6	[58] BAI	99B	BES	$\psi(2S) \to \gamma 2K^+2K^-$

$B(\chi_{c2}(1P) \to \phi\phi) \times B(\psi(2S) \to \gamma\chi_{c2}(1P))$

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
1.42±0.29 OUR FIT					
1.38±0.24±0.23	41	[59] ABLIKIM	06T	BES2	$\psi(2S) \to \gamma 2K^+2K^-$

$B(\chi_{c2}(1P) \to \phi\phi) \times \frac{\Gamma(\psi(2S) \to \gamma\chi_{c2}(1P))}{\Gamma(\psi(2S) \to J/\psi(1S)\pi^+\pi^-)}$

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
4.4±0.4 OUR FIT				
4.8±1.3±1.3	[60] BAI	99B	BES	$\psi(2S) \to \gamma 2K^+2K^-$

[44] Calculated by us. The value for $B(\chi_{c2} \to p\overline{p})$ reported in BAI 98I is derived using $B(\psi(2S) \to \gamma\chi_{c2}) = (7.8 \pm 0.8)\%$ and $B(\psi(2S) \to J/\psi(1S)\pi^+\pi^-) = (32.4 \pm 2.6)\%$ [BAI 98D].

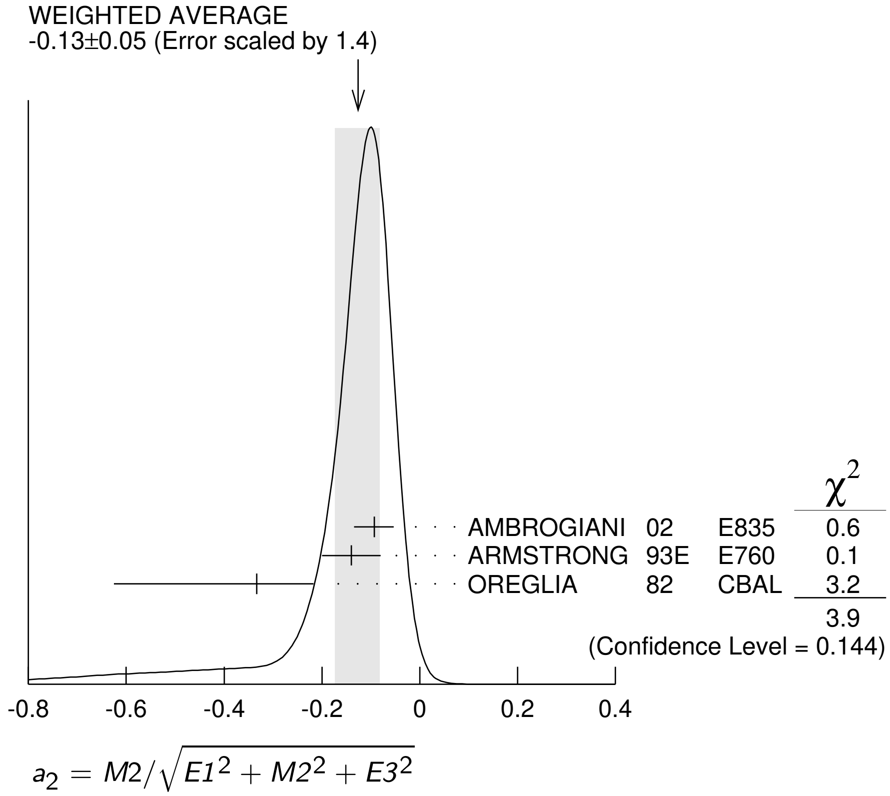
[45] Calculated by us. The value for $B(\chi_{c2} \to K^+K^-)$ reported by BAI 98I is derived using $B(\psi(2S) \to \gamma\chi_{c2}) = (7.8 \pm 0.8)\%$ and $B(\psi(2S) \to J/\psi\pi^+\pi^-) = (32.4 \pm 2.6)\%$ [BAI 98D].

[46] Calculated by us. The value of B($\chi_{c2} \rightarrow K^0_S K^0_S$) reported by BAI 99B was derived using B($\psi(2S) \rightarrow \gamma\chi_{c2}(1P)$) = (7.8 ± 0.8)% and B($\psi(2S) \rightarrow J/\psi\pi^+\pi^-$) = (32.4 ± 2.6)% [BAI 98D].
[47] Recalculated by us using B($J/\psi(1S) \rightarrow \ell^+\ell^-$) = 0.1181 ± 0.0020.
[48] Recalculated by us using B($J/\psi(1S) \rightarrow \mu^+\mu^-$) = 0.0588 ± 0.0010.
[49] Assumes isotropic gamma distribution.
[50] Not independent from other values reported by ADAM 05A.
[51] From a fit to the J/ψ recoil mass spectra.
[52] The value for B($\psi(2S) \rightarrow \gamma\chi_{c2}$)×B($\chi_{c2} \rightarrow \gamma J/\psi(1S)$) reported in HIMEL 80 is derived using B($\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-$) = (33 ± 3)% and B($J/\psi(1S) \rightarrow \ell^+\ell^-$) = 0.138 ± 0.018. Calculated by us using B($J/\psi(1S) \rightarrow \ell^+\ell^-$) = (0.1181 ± 0.0020).
[53] We have multiplied $\pi^0\pi^0$ measurement by 3 to obtain $\pi\pi$.
[54] Calculated by us. The value for B($\chi_{c2} \rightarrow \pi^+\pi^-$) reported by BAI 98I is derived using B($\psi(2S) \rightarrow \gamma\chi_{c2}$) = (7.8 ± 0.8)% and B($\psi(2S) \rightarrow J/\psi\pi^+\pi^-$) = (32.4 ± 2.6)% [BAI 98D]. We have multiplied $\pi^+\pi^-$ measurement by 3/2 to obtain $\pi\pi$.
[55] Calculated by us. The value for B($\chi_{c2} \rightarrow 2\pi^+2\pi^-$) reported in BAI 99B is derived using B($\psi(2S) \rightarrow \gamma\chi_{c2}$) = (7.8 ± 0.8)% and B($\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-$) = (32.4 ± 2.6)% [BAI 98D].
[56] The value for B($\psi(2S) \rightarrow \gamma\chi_{c2}$)×B($\chi_{c2} \rightarrow 2\pi^+\pi^-$) reported in TANENBAUM 78 is derived using B($\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-$)×B($J/\psi(1S)\ell^+\ell^-$) = (4.6 ± 0.7)%. Calculated by us using B($J/\psi(1S) \rightarrow \ell^+\ell^-$) = 0.1181 ± 0.0020.
[57] Calculated by us. The value of B($\chi_{c2} \rightarrow 2K^+2K^-$) reported by ABLIKIM 06T was derived using B($\psi(2S) \rightarrow \gamma\chi_{c2}(1P)$) = (8.1 ± 0.4)%.
[58] Calculated by us. The value of B($\chi_{c2} \rightarrow 2K^+2K^-$) reported by BAI 99B was derived using B($\psi(2S) \rightarrow \gamma\chi_{c2}(1P)$) = (7.8 ± 0.8)% and B($\psi(2S) \rightarrow J/\psi\pi^+\pi^-$) = (32.4 ± 2.6)% [BAI 98D].
[59] Calculated by us. The value of B($\chi_{c2} \rightarrow \phi\phi$) reported by ABLIKIM 06T was derived using B($\psi(2S) \rightarrow \gamma\chi_{c2}(1P)$) = (8.1 ± 0.4)%.
[60] Calculated by us. The value of B($\chi_{c2} \rightarrow \phi\phi$) reported by BAI 99B was derived using B($\psi(2S) \rightarrow \gamma\chi_{c2}(1P)$) = (7.8 ± 0.8)% and B($\psi(2S) \rightarrow J/\psi\pi^+\pi^-$) = (32.4 ± 2.6)% [BAI 98D].

MULTIPOLE AMPLITUDES IN $\chi_{c2}(1P) \rightarrow \gamma J/\psi(1S)$ RADIATIVE DECAY

$a_2 = M2/\sqrt{E1^2 + M2^2 + E3^2}$ Magnetic quadrupole fractional transition amplitude

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
−0.13 ±0.05 OUR AVERAGE		Error includes scale factor of 1.4. See the ideogram below.			
$-0.093^{+0.039}_{-0.041}\pm0.006$	5908	[61] AMBROGIANI	02	E835	$p\overline{p} \rightarrow \chi_{c2} \rightarrow J/\psi\gamma$
-0.14 ± 0.06	1904	[61] ARMSTRONG	93E	E760	$p\overline{p} \rightarrow \chi_{c2} \rightarrow J/\psi\gamma$
$-0.333^{+0.116}_{-0.292}$	441	[61] OREGLIA	82	CBAL	$\psi(2S) \rightarrow \chi_{c1}\gamma \rightarrow J/\psi\gamma\gamma$



$a_3 = E3/\sqrt{E1^2 + M2^2 + E3^2}$ Electric octupole fractional transition amplitude

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
$0.011^{+0.041}_{-0.033}$ OUR AVERAGE				
$0.020^{+0.055}_{-0.044} \pm 0.009$	5908	AMBROGIANI 02	E835	$p\overline{p} \to \chi_{c2} \to J/\psi\gamma$
$0.00\ ^{+0.06}_{-0.05}$	1904	ARMSTRONG 93E	E760	$p\overline{p} \to \chi_{c2} \to J/\psi\gamma$

[61] Assuming a_3=0.

$\chi_{c2}(1P)$ REFERENCES

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.)
DOBBS	06	PR D73 071101R	S. Dobbs *et al.*	(CLEO 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.)
ADAM	05A	PRL 94 232002	N.E. Adam *et al.*	(CLEO Collab.)
ANDREOTTI	05A	NP B717 34	M. Andreotti *et al.*	(FNAL E835 Collab.)
NAKAZAWA	05	PL B615 39	H. Nakazawa *et al.*	(BELLE Collab.)
ABLIKIM	04B	PR D70 012003	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	04H	PR D70 092003	M. Ablikim *et al.*	(BES 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.)
BAI	04I	PR D70 012006	J.Z. Bai *et al.*	(BES 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	02T	PL B540 33	K. Abe *et al.*	(BELLE Collab.)
AMBROGIANI	02	PR D65 052002	M. Ambrogiani *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.)
ACCIARRI	99E	PL B453 73	M. Acciarri *et al.*	(L3 Collab.)
BAI	99B	PR D60 072001	J.Z. Bai *et al.*	(BES Collab.)
ACKER..,K...	98	PL B439 197	K. Ackerstaff *et al.*	(OPAL 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.)
DOMINICK	94	PR D50 4265	J. Dominick *et al.*	(CLEO Collab.)
ARMSTRONG	93	PRL 70 2988	T.A. Armstrong *et al.*	(FNAL E760 Collab.)
ARMSTRONG	93E	PR D48 3037	T.A. Armstrong *et al.*	(FNAL-E760 Collab.)
BAUER	93	PL B302 345	D.A. Bauer *et al.*	(TPC Collab.)
ARMSTRONG	92	NP B373 35	T.A. Armstrong *et al.*	(FNAL, FERR, GENO+)
Also		PRL 68 1468	T.A. Armstrong *et al.*	(FNAL, FERR, GENO+)
BAGLIN	87B	PL B187 191	C. Baglin *et al.*	(R704 Collab.)
BAGLIN	86B	PL B172 455	C. Baglin	(LAPP, CERN, GENO, LYON, OSLO+)
GAISER	86	PR D34 711	J. Gaiser *et al.*	(Crystal Ball Collab.)
LEE	85	SLAC 282	R.A. Lee	(SLAC)
LEMOIGNE	82	PL 113B 509	Y. Lemoigne *et al.*	(SACL, LOIC, SHMP+)
OREGLIA	82	PR D25 2259	M.J. Oreglia *et al.*	(SLAC, CIT, HARV+)
Also		Private Comm.	M.J. Oreglia	(EFI)
BARATE	81	PR D24 2994	R. Barate *et al.*	(SACL, LOIC, SHMP, CERN+)
HIMEL	80	PRL 44 920	T. Himel *et al.*	(LBL, SLAC)
Also		Private Comm.	G. Trilling	(LBL, UCB)
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+)
WHITAKER	76	PRL 37 1596	J.S. Whitaker *et al.*	(SLAC, LBL)

OTHER RELATED PAPERS

ABLIKIM	04I	PR D70 092004	M. Ablikim *et al.*	(BES Collab.)
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.)
BARATE	83	PL 121B 449	R. Barate *et al.*	(SACL, LOIC, SHMP, IND)
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)