$\chi_{c2}(1P)$

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

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*
3556.18± 0.13 OUR AVERAGE					
3559.9 ± 2.9		EISENSTEIN	01	CLE2	$e^+e^- \to e^+e^-\chi_{c2}$
3556.4 ± 0.7		BAI	99B	BES	$\psi(2S) \to \gamma X$
3556.15± 0.07±0.12	585	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		[1] GAISER	86	CBAL	$\psi(2S) \to \gamma X$
3553.4 ± 2.2	66	[2] LEMOIGNE	82	GOLI	190 π^- Be $\to \gamma 2\mu$
3555.9 ± 0.7		[3] OREGLIA	82	CBAL	$e^+e^- \to J/\psi 2\gamma$
3557 ± 1.5	69	[4] 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		[4] BARTEL	78B	CNTR	$e^+e^- \to J/\psi 2\gamma$
3553 ± 4 ±4		[4,5] TANENBAUM	78	MRK1	e^+e^-
3563 ± 7	360	[4] 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] Using mass of $\psi(2S) = 3686.0$ MeV.
[2] $J/\psi(1S)$ mass constrained to 3097 MeV.
[3] Assuming $\psi(2S)$ mass = 3686 MeV and $J/\psi(1S)$ mass = 3097 MeV.
[4] Mass value shifted by us by amount appropriate for $\psi(2S)$ mass = 3686 MeV and $J/\psi(1S)$ mass = 3097 MeV.
[5] From a simultaneous fit to radiative and hadronic decay channels.

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

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
2.11±0.17 OUR NEW UNCHECKED FIT [2.08 ± 0.17 MeV OUR 2002 FIT]					
2.00±0.18 OUR AVERAGE					
1.98±0.17±0.07	585	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 $^{+2.1}_{-2.0}$		[6] GAISER	86	CBAL	$\psi(2S) \to \gamma X$

[6] 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	$2(\pi^+\pi^-)$	(1.49 ± 0.21) %	
Γ_2	$\pi^+\pi^- K^+ K^-$	(10 ± 4) × 10^{-3}	S=2.0
Γ_3	$3(\pi^+\pi^-)$	(9.2 ± 2.2) × 10^{-3}	
Γ_4	$\rho^0\pi^+\pi^-$	(7 ± 4) × 10^{-3}	
Γ_5	$K^+\overline{K}^*(892)^0\pi^-$ + c.c.	(4.8 ± 2.8) × 10^{-3}	
Γ_6	$\phi\phi$	(2.0 ± 0.8) × 10^{-3}	
Γ_7	$\pi^+\pi^-$	(1.52 ± 0.25) × 10^{-3}	
Γ_8	$\pi^0\pi^0$	(10 ± 6) × 10^{-4}	
Γ_9	$\eta\eta$	< 1.37 × 10^{-3}	CL=90%
Γ_{10}	$K^+K^-K^+K^-$	(1.5 ± 0.4) × 10^{-3}	
Γ_{11}	$\pi^+\pi^- p\overline{p}$	(1.4 ± 0.6) × 10^{-3}	S=1.5
Γ_{12}	K^+K^-	(8.1 ± 1.9) × 10^{-4}	
Γ_{13}	$K^0_S K^0_S$	(6.1 ± 2.3) × 10^{-4}	
Γ_{14}	$p\overline{p}$	(6.8 ± 0.8) × 10^{-5}	
Γ_{15}	$J/\psi(1S)\pi^+\pi^-\pi^0$	< 1.5 %	CL=90%
Γ_{16}	$K^0_S K^+\pi^-$ + c.c.	< 1.06 × 10^{-3}	CL=90%
	Radiative decays		
Γ_{17}	$\gamma J/\psi(1S)$	(20.2 ± 1.8) %	
Γ_{18}	$\gamma\gamma$	(2.46 ± 0.23) × 10^{-4}	

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

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

$\Gamma(p\overline{p}) \times \Gamma(\gamma J/\psi(1S))/\Gamma_{total}$ **$\Gamma_{14}\Gamma_{17}/\Gamma$**

VALUE (eV)	*DOCUMENT ID*		*TECN*	*COMMENT*
29.0±2.4 OUR NEW UNCHECKED FIT [28.9 ± 2.4 eV OUR 2002 FIT]				
28.9±2.5 OUR AVERAGE				
28.2±2.6	[7] ARMSTRONG	92	E760	$\overline{p}p \to e^+e^-\gamma$
36 ±8	[7] BAGLIN	86B	SPEC	$\overline{p}p \to e^+e^-$X

$\Gamma(\gamma\gamma) \times \Gamma(\gamma J/\psi(1S))/\Gamma_{total}$ **$\Gamma_{18}\Gamma_{17}/\Gamma$**

VALUE (eV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
105± 13 OUR NEW UNCHECKED FIT [85 ± 19 eV OUR 2002 FIT]					
121± 13 OUR NEW AVERAGE [169 ± 40 eV OUR 2002 AVERAGE]					
114± 11± 9	136± 13.3	[8] ABE	02T	BELL	$e^+e^- \to \chi_{c2}$
139± 55± 21		[9] ACCIARRI	99E	L3	$e^+e^- \to e^+e^-\chi_{c2}$
242± 65± 51		[10] ACKER..,K...	98	OPAL	$e^+e^- \to e^+e^-\chi_{c2}$
150± 42± 36		[11] DOMINICK	94	CLE2	$e^+e^- \to e^+e^-\chi_{c2}$
470±240±120		[12] BAUER	93	TPC	$e^+e^- \to e^+e^-\chi_{c2}$

$\Gamma(\gamma\gamma) \times \Gamma(2(\pi^+\pi^-))/\Gamma_{total}$ $\Gamma_{18}\Gamma_1/\Gamma$

VALUE (eV)	DOCUMENT ID	TECN	COMMENT
7.7±1.1 OUR NEW UNCHECKED FIT [6.4 ± 1.4 eV OUR 2002 FIT]			
6.4±1.8±0.8	EISENSTEIN 01	CLE2	$e^+e^- \to e^+e^-\chi_{c2}$

[7] Calculated by us using $B(J/\psi(1S) \to e^+e^-) = 0.0593 \pm 0.0010$.
[8] Using $B(J/\psi \to \ell^+\ell^-) = 0.1181 \pm 0.0020$. All systematic errors added in quadrature.
[9] The value for $\Gamma(\chi_{c2} \to \gamma\gamma)$ reported in ACCIARRI 99E is derived using $B(\chi_{c2} \to \gamma J/\psi(1S)) \times B(J/\psi(1S) \to \ell^+\ell^-) = 0.0162 \pm 0.0014$. Calculated by us using $B(J/\psi(1S) \to \ell^+\ell^-) = 0.1181 \pm 0.0020$.
[10] 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 $B(J/\psi(1S) \to \ell^+\ell^-) = 0.1203 \pm 0.0038$. Calculated by us using $B(J/\psi(1S) \to \ell^+\ell^-) = 0.1181 \pm 0.0020$.
[11] 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 $B(J/\psi(1S) \to \mu^+\mu^-) = 0.0597 \pm 0.0025$. Calculated by us using $B(J/\psi(1S) \to \ell^+\ell^-) = 0.1181 \pm 0.0020$.
[12] 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 $B(J/\psi(1S) \to \mu^+\mu^-) = 0.0597 \pm 0.0025$. Calculated by us using $B(J/\psi(1S) \to \ell^+\ell^-) = 0.1181 \pm 0.0020$.

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

HADRONIC DECAYS

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

VALUE	DOCUMENT ID
0.0149±0.0021 OUR NEW UNCHECKED FIT [0.0141 ± 0.0020 OUR 2002 FIT]	

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

VALUE	DOCUMENT ID	TECN	COMMENT
0.010 ±0.004 OUR AVERAGE	Error includes scale factor of 2.0.		
0.0079±0.0006±0.0021	[13] BAI 99B	BES	$\psi(2S) \to \gamma\chi_{c2}$
0.019 ±0.005	[14] TANENBAUM 78	MRK1	$\psi(2S) \to \gamma\chi_{c2}$

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

VALUE	DOCUMENT ID	TECN	COMMENT
0.0092±0.0022 OUR AVERAGE			
0.009 ±0.001 ±0.002	[13] BAI 99B	BES	$\psi(2S) \to \gamma\chi_{c2}$
0.012 ±0.008	[14] TANENBAUM 78	MRK1	$\psi(2S) \to \gamma\chi_{c2}$

$\Gamma(\rho^0\pi^+\pi^-)/\Gamma_{total}$ Γ_4/Γ

VALUE (units 10^{-4})	DOCUMENT ID	TECN	COMMENT
68±40	[14] TANENBAUM 78	MRK1	$\psi(2S) \to \gamma\chi_{c2}$

$\Gamma(K^+\overline{K}^*(892)^0\pi^- + \text{c.c.})/\Gamma_{total}$ Γ_5/Γ

VALUE (units 10^{-4})	DOCUMENT ID	TECN	COMMENT
48±28	[14] TANENBAUM 78	MRK1	$\psi(2S) \to \gamma\chi_{c2}$

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

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
2.00±0.55±0.61	[13] BAI	99B	BES	$\psi(2S) \to \gamma\chi_{c2}$

$\Gamma(\pi^+\pi^-)/\Gamma_{total}$ Γ_7/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
1.52±0.25 OUR AVERAGE					
1.49±0.14±0.22	185±16	[13] BAI	98I	BES	$\psi(2S) \to \gamma\chi_{c2}$
1.9 ±1.0	4	[14] BRANDELIK	79C	DASP	$\psi(2S) \to \gamma\chi_{c2}$

$[\Gamma(\pi^+\pi^-)+\Gamma(K^+K^-)]/\Gamma_{total}$ $(\Gamma_7+\Gamma_{12})/\Gamma$

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
24±10	[14] TANENBAUM	78	MRK1	$\psi(2S) \to \gamma\chi_{c2}$

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

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
1.48±0.26±0.32	[13] BAI	99B	BES	$\psi(2S) \to \gamma\chi_{c2}$

$\Gamma(\pi^+\pi^-p\bar{p})/\Gamma_{total}$ Γ_{11}/Γ

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
14 ± 6 OUR AVERAGE Error includes scale factor of 1.5.				
12.3± 2.0±3.5	[13] BAI	99B	BES	$\psi(2S) \to \gamma\chi_{c2}$
33 ±13	[14] TANENBAUM	78	MRK1	$\psi(2S) \to \gamma\chi_{c2}$

$\Gamma(K^+K^-)/\Gamma_{total}$ Γ_{12}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
0.81±0.19 OUR AVERAGE					
0.79±0.14±0.13	115±13	[13] BAI	98I	BES	$\psi(2S) \to \gamma\chi_{c2}$
1.5 ±1.1	2	[14] BRANDELIK	79C	DASP	$\psi(2S) \to \gamma\chi_{c2}$

$\Gamma(K^0_S K^0_S)/\Gamma_{total}$ Γ_{13}/Γ

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
0.61±0.17±0.16	[13] BAI	99B	BES	$\psi(2S) \to \gamma\chi_{c2}$

$\Gamma(p\bar{p})/\Gamma_{total}$ Γ_{14}/Γ

VALUE (units 10^{-4})	DOCUMENT ID
0.68±0.08 OUR NEW UNCHECKED FIT [$(0.74 \pm 0.10) \times 10^{-4}$ OUR 2002 FIT]	

$\Gamma(\pi^0\pi^0)/\Gamma_{total}$ Γ_8/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
1.0 ±0.6 OUR NEW AVERAGE [$(1.10 \pm 0.28) \times 10^{-3}$ OUR 1996 AVERAGE]					
0.98±0.27±0.56	20.8±5.8	[15] BAI	03C	BES	$\psi(2S) \to \gamma\pi^0\pi^0 \to 5\gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1.1 ±0.2 ±0.2		[13] LEE	85	CBAL	$\psi' \to$ photons

$\Gamma(\eta\eta)/\Gamma_{total}$ Γ_9/Γ

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
<13.7	90	[15] BAI	03C	BES	$\psi(2S) \to \gamma\eta\eta \to 5\gamma$

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

$7.9 \pm 4.1 \pm 2.4$	[13] LEE	85	CBAL	$\psi' \to$ photons	

$\Gamma(J/\psi(1S)\pi^+\pi^-\pi^0)/\Gamma_{total}$ Γ_{15}/Γ

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

$\Gamma(K_S^0 K^+\pi^- + \text{c.c.})/\Gamma_{total}$ Γ_{16}/Γ

VALUE (units 10^{-3})	CL%	DOCUMENT ID		TECN	COMMENT
<1.06	90	[13] BAI	99B	BES	$\psi(2S) \to \gamma\chi_{c2}$

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

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

[15] Derived using $B(\psi(1S) \to \gamma\chi_{c0}) = 0.087 \pm 0.008$ and $B(\psi(2S) \to J/\psi\pi^+\pi^-) = 0.305 \pm 0.016$.

RADIATIVE DECAYS

$\Gamma(\gamma J/\psi(1S))/\Gamma_{total}$ Γ_{17}/Γ

VALUE	DOCUMENT ID
0.202±0.018 OUR NEW UNCHECKED FIT [0.187 ± 0.020 OUR 2002 FIT]	

$\Gamma(\gamma\gamma)/\Gamma_{total}$ Γ_{18}/Γ

VALUE (units 10^{-4})	DOCUMENT ID
2.46±0.23 OUR NEW UNCHECKED FIT [$(2.19 \pm 0.32) \times 10^{-4}$ OUR 2002 FIT]	

$\Gamma(\gamma\gamma)/\Gamma(\gamma J/\psi(1S))$ Γ_{18}/Γ_{17}

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
1.21±0.17 OUR NEW UNCHECKED FIT [$(1.17 \pm 0.26) \times 10^{-3}$ OUR 2002 FIT]				
0.99±0.18	[16] AMBROGIANI	00B	E835	$\overline{p}p \to \chi_{c2} \to \gamma\gamma$, $\gamma J/\psi$

$\Gamma(\gamma\gamma) \times \Gamma(p\overline{p})/\Gamma_{total}^2$ $\Gamma_{18}\Gamma_{14}/\Gamma^2$

VALUE (units 10^{-8})	DOCUMENT ID		TECN	COMMENT
1.66±0.24 OUR NEW UNCHECKED FIT [$(1.63 \pm 0.24) \times 10^{-8}$ OUR 2002 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	$\overline{p}p \to \gamma\gamma X$

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

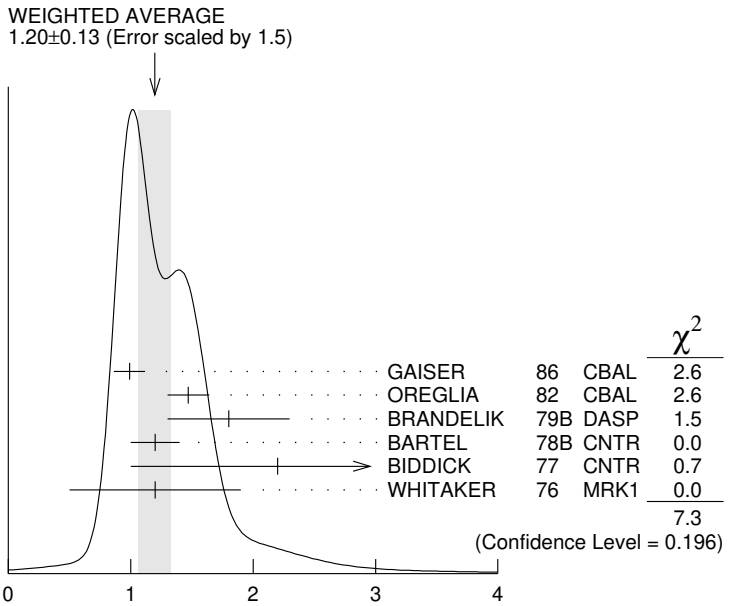
$\chi_{c2}(1P)$ CROSS-PARTICLE BRANCHING RATIOS

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

VALUE (units 10^{-5})	*DOCUMENT ID*		*TECN*	*COMMENT*
1.37±0.24 OUR NEW UNCHECKED FIT	[$(1.7 \pm 0.4) \times 10^{-5}$ OUR 2002 FIT]			
1.4 ±1.1	[17] BAI	98I	BES	$\psi(2S) \rightarrow \gamma\chi_{c2} \rightarrow \gamma\overline{p}p$

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

VALUE (units 10^{-2})	*DOCUMENT ID*		*TECN*	*COMMENT*
1.30±0.08 OUR NEW UNCHECKED FIT	[$(1.27 \pm 0.08) \times 10^{-2}$ OUR 2002 FIT]			
1.20±0.13 OUR AVERAGE	Error includes scale factor of 1.5. See the ideogram below.			
0.99±0.10±0.08	GAISER	86	CBAL	$\psi(2S) \rightarrow \gamma X$
1.47±0.17	[18] OREGLIA	82	CBAL	$\psi(2S) \rightarrow \gamma\chi_{c2}$
1.8 ±0.5	[19] BRANDELIK	79B	DASP	$\psi(2S) \rightarrow \gamma\chi_{c2}$
1.2 ±0.2	[19] BARTEL	78B	CNTR	$\psi(2S) \rightarrow \gamma\chi_{c2}$
2.2 ±1.2	[20] BIDDICK	77	CNTR	$e^+e^- \rightarrow \gamma X$
1.2 ±0.7	[18] WHITAKER	76	MRK1	e^+e^-



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

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

VALUE (units 10^{-2})	*DOCUMENT ID*		*TECN*	*COMMENT*
4.09±0.28 OUR NEW UNCHECKED FIT	[$(4.2 \pm 0.4) \times 10^{-2}$ OUR 2002 FIT]			
3.9 ±1.2	[21] HIMEL	80	MRK2	$\psi(2S) \to \gamma\chi_{c2}$

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

VALUE (units 10^{-5})	*DOCUMENT ID*		*TECN*	*COMMENT*
1.58±0.19 OUR NEW UNCHECKED FIT	[$(1.49 \pm 0.20) \times 10^{-5}$ OUR 2002 FIT]			
7.0 ±2.1 ±2.0	LEE	85	CBAL	$\psi(2S) \to \gamma\chi_{c2}$

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

VALUE (units 10^{-3})	*DOCUMENT ID*		*TECN*	*COMMENT*
3.0±0.4 OUR NEW UNCHECKED FIT	[$(3.1 \pm 0.5) \times 10^{-3}$ OUR 2002 FIT]			
3.1±1.0 OUR AVERAGE	Error includes scale factor of 2.5.			
$2.3 \pm 0.1 \pm 0.5$	[22] BAI	99B	BES	$\psi(2S) \to \gamma\chi_{c2}$
4.3 ± 0.6	[23] TANENBAUM	78	MRK1	$\psi(2S) \to \gamma\chi_{c2}$

[17] 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].

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

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

[20] Assumes isotropic gamma distribution.

[21] The value for $B(\psi(2S) \to \gamma\chi_{c2}) \times B(\chi_{c2} \to \gamma J/\psi(1S))$ reported in HIMEL 80 is derived using $B(\psi(2S) \to J/\psi(1S)\pi^+\pi^-) = (33 \pm 3)\%$ and $B(J/\psi(1S) \to \ell^+\ell^-) = 0.138 \pm 0.018$. Calculated by us using $B(J/\psi(1S) \to \ell^+\ell^-) = (0.1181 \pm 0.0020)$.

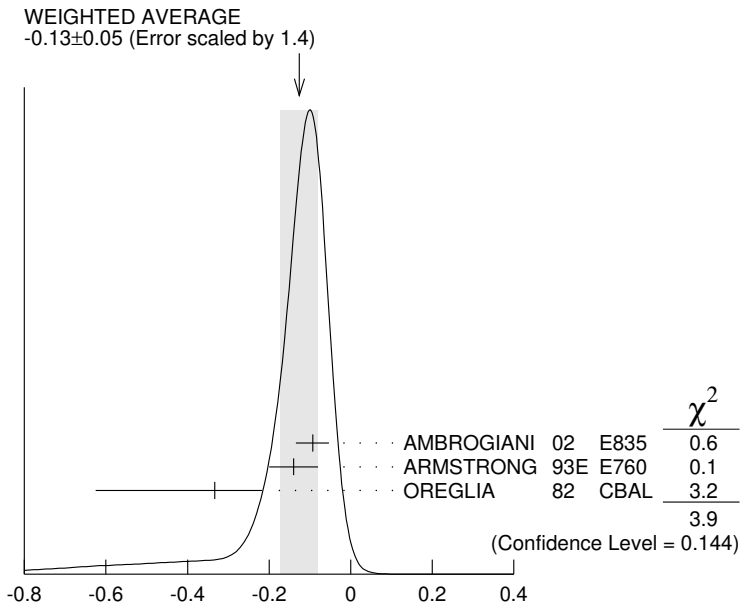
[22] Calculated by us. The value for $B(\chi_{c2} \to 2\pi^+2\pi^-)$ reported in BAI 99B is derived using $B(\psi(2S) \to \gamma\chi_{c2}) = (7.8 \pm 0.8)\%$ and $B(\psi(2S) \to J/\psi(1S)\pi^+\pi^-) = (32.4 \pm 2.6)\%$ [BAI 98D].

[23] The value for $B(\psi(2S) \to \gamma\chi_{c2}) \times B(\chi_{c2} \to 2\pi^+\pi^-)$ reported in TANENBAUM 78 is derived using $B(\psi(2S) \to J/\psi(1S)\pi^+\pi^-) \times B(J/\psi(1S)\ell^+\ell^-) = (4.6 \pm 0.7)\%$. Calculated by us using $B(J/\psi(1S) \to \ell^+\ell^-) = 0.1181 \pm 0.0020$.

MULTIPOLE AMPLITUDES IN $\chi_{c2}(1P) \to \gamma J/\psi(1S)$ 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 NEW AVERAGE	Error includes scale factor of 1.4. See the ideogram below. [−0.140 ± 0.006 OUR 2002 AVERAGE]				
$-0.093^{+0.039}_{-0.041} \pm 0.006$	5908	[24] AMBROGIANI	02	E835	$p\overline{p} \to \chi_{c2} \to J/\psi\gamma$
-0.14 ± 0.06	1904	[24] ARMSTRONG	93E	E760	$p\overline{p} \to \chi_{c2} \to J/\psi\gamma$
$-0.333^{+0.116}_{-0.292}$	441	[24] OREGLIA	82	CBAL	$\psi(2S) \to \chi_{c1}\gamma \to J/\psi\gamma\gamma$



$a_2 = M2/\sqrt{E1^2 + M2^2 + E3^2}$

$a_3 = M2/\sqrt{E1^2 + M2^2 + E3^2}$ 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	$p\overline{p} \rightarrow \chi_{c2} \rightarrow J/\psi\gamma$
$0.00\,^{+0.06}_{-0.05}$	1904	ARMSTRONG 93E	E760	$p\overline{p} \rightarrow \chi_{c2} \rightarrow J/\psi\gamma$

[24] Assuming a_3=0.

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

BAI	03C	PR D67 032004	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	92B	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	82B	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	82	Private Comm.	G. Trilling	(LBL, UCB)
BRANDELIK	79B	NP B160 426	R. Brandelik *et al.*	(DASP Collab.)
BRANDELIK	79C	ZPHY C1 233	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	82	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

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.	75C	PRL 35 1189	G.J. Feldman	
TANENBAUM	75	PRL 35 1323	W.M. Tanenbaum *et al.*	(LBL, SLAC)