$\chi_{c2}(1P)$

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

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*
3556.26± 0.11 OUR AVERAGE					
3559.9 ± 2.9		EISENSTEIN	01	CLE2	$e^+e^- \to e^+e^-\chi_{c2}$
3556.4 ± 0.7		BAI	99B	BES	$\psi(2S) \to \gamma X$
3556.24± 0.07±0.09	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	190 π^- Be $\to \gamma 2\mu$
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] Mass central value and systematic error recalculated by us according to Eq. (16) in ARMSTRONG 93B, using the value for the $\psi(2S)$ 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*
2.11±0.16 OUR 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 $^{+2.1}_{-2.0}$		[7] GAISER	86	CBAL	$\psi(2S) \to \gamma X$

[7] Errors correspond to 90% confidence level; authors give only width range.

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

Mode	Fraction (Γ_i/Γ)	Confidence level

Hadronic decays

Γ_1	$2(\pi^+\pi^-)$	$(1.48\pm0.21)\ \%$	
Γ_2	$\pi^+\pi^- K^+ K^-$	$(1.24\pm0.33)\ \%$	
Γ_3	$3(\pi^+\pi^-)$	$(1.07\pm0.24)\ \%$	
Γ_4	$\rho^0\pi^+\pi^-$	$(7\ \pm4\ )\times10^{-3}$	
Γ_5	$K^+\overline{K}^*(892)^0\pi^-$ + c.c.	$(4.8\ \pm2.8\ )\times10^{-3}$	
Γ_6	$\phi\phi$	$(2.4\ \pm0.9\ )\times10^{-3}$	
Γ_7	$\pi^+\pi^-$	$(1.77\pm0.27)\times10^{-3}$	
Γ_8	$\pi^0\pi^0$	$(1.1\ \pm0.7\ )\times10^{-3}$	
Γ_9	$\eta\eta$	$<\ 1.5\ \times10^{-3}$	90%
Γ_{10}	$K^+K^-K^+K^-$	$(1.8\ \pm0.5\ )\times10^{-3}$	
Γ_{11}	$\pi^+\pi^- p\overline{p}$	$(1.7\ \pm0.4\ )\times10^{-3}$	
Γ_{12}	K^+K^-	$(9.4\ \pm2.1\ )\times10^{-4}$	
Γ_{13}	$K^0_S K^0_S$	$(7.2\ \pm2.7\ )\times10^{-4}$	
Γ_{14}	$p\overline{p}$	$(6.8\ \pm0.7\ )\times10^{-5}$	
Γ_{15}	$\Lambda\overline{\Lambda}$	$(3.4\ \pm1.7\ )\times10^{-4}$	
Γ_{16}	$J/\psi(1S)\pi^+\pi^-\pi^0$	$<\ 1.5\ \%$	90%
Γ_{17}	$K^0_S K^+\pi^-$ + c.c.	$<\ 1.3\ \times10^{-3}$	90%

Radiative decays

Γ_{18}	$\gamma J/\psi(1S)$	$(20.2\ \pm1.7\ )\ \%$	
Γ_{19}	$\gamma\gamma$	$(2.46\pm0.23)\times10^{-4}$	

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

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

$\Gamma(p\overline{p})\times\Gamma(\gamma J/\psi(1S))/\Gamma_{\text{total}}$ — $\Gamma_{14}\Gamma_{18}/\Gamma$

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

$\Gamma(\gamma\gamma)\times\Gamma(\gamma J/\psi(1S))/\Gamma_{\text{total}}$ — $\Gamma_{19}\Gamma_{18}/\Gamma$

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

$\Gamma(\gamma\gamma) \times \Gamma(2(\pi^+\pi^-))/\Gamma_{total}$ $\Gamma_{19}\Gamma_1/\Gamma$

VALUE (eV)	*DOCUMENT ID*		*TECN*	*COMMENT*
7.7±1.1 OUR FIT				
6.4±1.8±0.8	EISENSTEIN	01	CLE2	$e^+e^- \rightarrow e^+e^-\chi_{c2}$

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

[9] Using B($J/\psi \rightarrow \ell^+\ell^-$) = 0.1181 ± 0.0020. All systematic errors added in quadrature.

[10] The value for $\Gamma(\chi_{c2} \rightarrow \gamma\gamma)$ reported in ACCIARRI 99E is derived using B($\chi_{c2} \rightarrow \gamma J/\psi(1S)$)×B($J/\psi(1S) \rightarrow \ell^+\ell^-$) = 0.0162 ± 0.0014. Calculated by us using B($J/\psi(1S) \rightarrow \ell^+\ell^-$) = 0.1181 ± 0.0020.

[11] The value for $\Gamma(\chi_{c2} \rightarrow \gamma\gamma)$ reported in ACKERSTAFF,K 98 is derived using B($\chi_{c2} \rightarrow \gamma J/\psi(1S)$) = 0.135 ± 0.011 and B($J/\psi(1S) \rightarrow \ell^+\ell^-$) = 0.1203 ± 0.0038. Calculated by us using B($J/\psi(1S) \rightarrow \ell^+\ell^-$) = 0.1181 ± 0.0020.

[12] The value for $\Gamma(\chi_{c2} \rightarrow \gamma\gamma)$ reported in DOMINICK 94 is derived using B($\chi_{c2} \rightarrow \gamma J/\psi(1S)$)= 0.135 ± 0.011, B($J/\psi(1S) \rightarrow e^+e^-$) = 0.0627 ± 0.0020, and B($J/\psi(1S) \rightarrow \mu^+\mu^-$) = 0.0597 ± 0.0025. Calculated by us using B($J/\psi(1S) \rightarrow \ell^+\ell^-$) = 0.1181 ± 0.0020.

[13] The value for $\Gamma(\chi_{c2} \rightarrow \gamma\gamma)$ reported in BAUER 93 is derived using B($\chi_{c2} \rightarrow \gamma J/\psi(1S)$)= 0.135 ± 0.011, B($J/\psi(1S) \rightarrow e^+e^-$) = 0.0627 ± 0.0020, and B($J/\psi(1S) \rightarrow \mu^+\mu^-$) = 0.0597 ± 0.0025. Calculated by us using B($J/\psi(1S) \rightarrow \ell^+\ell^-$) = 0.1181 ± 0.0020.

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

—— HADRONIC DECAYS ——

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

VALUE	*DOCUMENT ID*
0.0148±0.0021 OUR FIT	

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

VALUE (units 10^{-3})	*DOCUMENT ID*		*TECN*	*COMMENT*
12.4±3.3 OUR EVALUATION	Treating systematic error as correlated.			
12 ±4 OUR AVERAGE	Error includes scale factor of 2.1.			
9.4±0.7±2.3	[14] BAI	99B	BES	$\psi(2S) \rightarrow \gamma\chi_{c2}$
18.7±3.3±1.8	[14] TANENBAUM	78	MRK1	$\psi(2S) \rightarrow \gamma\chi_{c2}$

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

VALUE (units 10^{-3})	*DOCUMENT ID*		*TECN*	*COMMENT*
10.7±2.4 OUR EVALUATION	Treating systematic error as correlated.			
10.7±2.4 OUR AVERAGE				
10.7±1.2±2.2	[14] BAI	99B	BES	$\psi(2S) \rightarrow \gamma\chi_{c2}$
10.8±7.4±1.0	[14] TANENBAUM	78	MRK1	$\psi(2S) \rightarrow \gamma\chi_{c2}$

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

VALUE (units 10^{-4})	*DOCUMENT ID*		*TECN*	*COMMENT*
68±40	[15] TANENBAUM	78	MRK1	$\psi(2S) \rightarrow \gamma\chi_{c2}$

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

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
48±28	[15] TANENBAUM	78	MRK1	$\psi(2S) \to \gamma \chi_{c2}$

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

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
2.4±0.6±0.7	[14] BAI	99B	BES	$\psi(2S) \to \gamma \chi_{c2}$

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

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
1.77±0.17±0.21	185 ± 16	[14] BAI	98I	BES	$\psi(2S) \to \gamma \chi_{c2}$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1.9 ±1.0	4	[15] BRANDELIK	79C	DASP	$\psi(2S) \to \gamma \chi_{c2}$

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

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
1.08±0.30±0.61	20.8 ± 5.8	[14] 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		[16] LEE	85	CBAL	$\psi' \to$ photons

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

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
24±10	[15] TANENBAUM	78	MRK1	$\psi(2S) \to \gamma \chi_{c2}$

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

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
1.75±0.31±0.34	[14] BAI	99B	BES	$\psi(2S) \to \gamma \chi_{c2}$

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

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
1.7 ±0.4 OUR EVALUATION Treating systematic error as correlated.				
1.7 ±0.6 OUR AVERAGE Error includes scale factor of 1.3.				
1.46±0.24±0.40	[14] BAI	99B	BES	$\psi(2S) \to \gamma \chi_{c2}$
3.30±1.28±0.32	[14] TANENBAUM	78	MRK1	$\psi(2S) \to \gamma \chi_{c2}$

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

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
0.94±0.17±0.13	115 ± 13	[14] BAI	98I	BES	$\psi(2S) \to \gamma \chi_{c2}$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1.5 ±1.1	2	[15] BRANDELIK	79C	DASP	$\psi(2S) \to \gamma \chi_{c2}$

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

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
0.72±0.20±0.18	[14] BAI	99B	BES	$\psi(2S) \to \gamma \chi_{c2}$

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

VALUE (units 10^{-4})	*DOCUMENT ID*
0.68±0.07 OUR FIT	

$\Gamma(\Lambda\overline{\Lambda})/\Gamma_{total}$ — Γ_{15}/Γ

VALUE (units 10^{-4})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
3.4±1.5±0.7	$8.3^{+3.7}_{-3.4}$	[14] BAI	03E	BES	$\psi(2S) \rightarrow \gamma\chi_{c2} \rightarrow \gamma\Lambda\overline{\Lambda}$

$\Gamma(\eta\eta)/\Gamma_{total}$ — Γ_{9}/Γ

VALUE (units 10^{-4})	*CL%*	*DOCUMENT ID*		*TECN*	*COMMENT*
<15	90	[14] BAI	03C	BES	$\psi(2S) \rightarrow \gamma\eta\eta \rightarrow 5\gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
7.9±4.1±2.4		[16] LEE	85	CBAL	$\psi' \rightarrow$ photons

$\Gamma(J/\psi(1S)\pi^+\pi^-\pi^0)/\Gamma_{total}$ — Γ_{16}/Γ

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

$\Gamma(K^0_S K^+\pi^- + \text{c.c.})/\Gamma_{total}$ — Γ_{17}/Γ

VALUE (units 10^{-3})	*CL%*	*DOCUMENT ID*		*TECN*	*COMMENT*
<1.3	90	[14] BAI	99B	BES	$\psi(2S) \rightarrow \gamma\chi_{c2}$

[14] Rescaled by us using B($\psi(2S) \rightarrow \gamma\chi_{c2}$)= (6.4 ± 0.6)% and B($\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-$) = 0.317 ± 0.011.

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

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

RADIATIVE DECAYS

$\Gamma(\gamma J/\psi(1S))/\Gamma_{total}$ — Γ_{18}/Γ

VALUE	*DOCUMENT ID*
0.202±0.017 OUR FIT	

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

VALUE (units 10^{-4})	*DOCUMENT ID*
2.46±0.23 OUR FIT	

$\Gamma(\gamma\gamma)/\Gamma(\gamma J/\psi(1S))$ — Γ_{19}/Γ_{18}

VALUE (units 10^{-3})	*DOCUMENT ID*		*TECN*	*COMMENT*
1.21±0.16 OUR FIT				
0.99±0.18	[17] AMBROGIANI	00B	E835	$\overline{p}p \rightarrow \chi_{c2} \rightarrow \gamma\gamma, \gamma J/\psi$

$\Gamma(\gamma\gamma) \times \Gamma(p\overline{p})/\Gamma^2_{total}$ — $\Gamma_{19}\Gamma_{14}/\Gamma^2$

VALUE (units 10^{-8})	*DOCUMENT ID*		*TECN*	*COMMENT*
1.66±0.24 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	$\overline{p}p \to \gamma\gamma X$

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

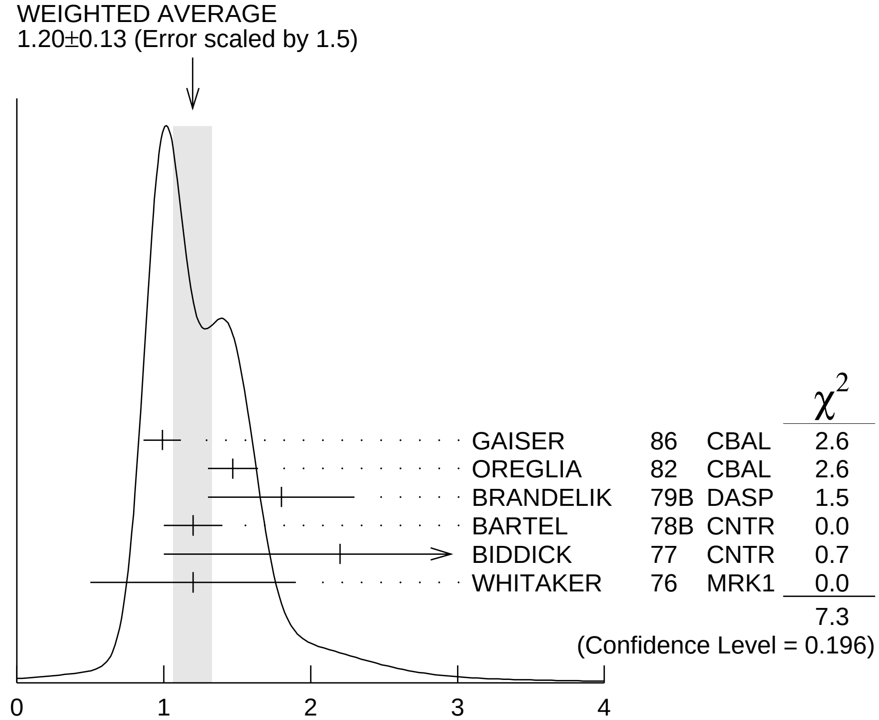
$\chi_{c2}(1P)$ CROSS-PARTICLE BRANCHING RATIOS

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

VALUE (units 10^{-5})	*DOCUMENT ID*		*TECN*	*COMMENT*
1.38±0.23 OUR FIT				
1.4 ±1.1	[18] BAI	98I	BES	$\psi(2S) \to \gamma\chi_{c2} \to \gamma\overline{p}p$

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

VALUE (units 10^{-2})	*DOCUMENT ID*		*TECN*	*COMMENT*
1.30±0.08 OUR 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	$\psi(2S) \to \gamma X$
1.47±0.17	[19] OREGLIA	82	CBAL	$\psi(2S) \to \gamma\chi_{c2}$
1.8 ±0.5	[20] BRANDELIK	79B	DASP	$\psi(2S) \to \gamma\chi_{c2}$
1.2 ±0.2	[20] BARTEL	78B	CNTR	$\psi(2S) \to \gamma\chi_{c2}$
2.2 ±1.2	[21] BIDDICK	77	CNTR	$e^+e^- \to \gamma X$
1.2 ±0.7	[19] WHITAKER	76	MRK1	e^+e^-



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

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

VALUE (units 10^{-2})	*DOCUMENT ID*		*TECN*	*COMMENT*
4.11±0.29 OUR FIT				
3.9 ±1.2	[22] 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 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 FIT				
3.1±1.0 OUR AVERAGE Error includes scale factor of 2.5.				
2.3±0.1±0.5	[23] BAI	99B	BES	$\psi(2S) \to \gamma\chi_{c2}$
4.3±0.6	[24] TANENBAUM	78	MRK1	$\psi(2S) \to \gamma\chi_{c2}$

[18] Calculated by us. The value for B($\chi_{c2} \rightarrow p\overline{p}$) reported in BAI 98I 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].

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

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

[21] Assumes isotropic gamma distribution.

[22] 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).

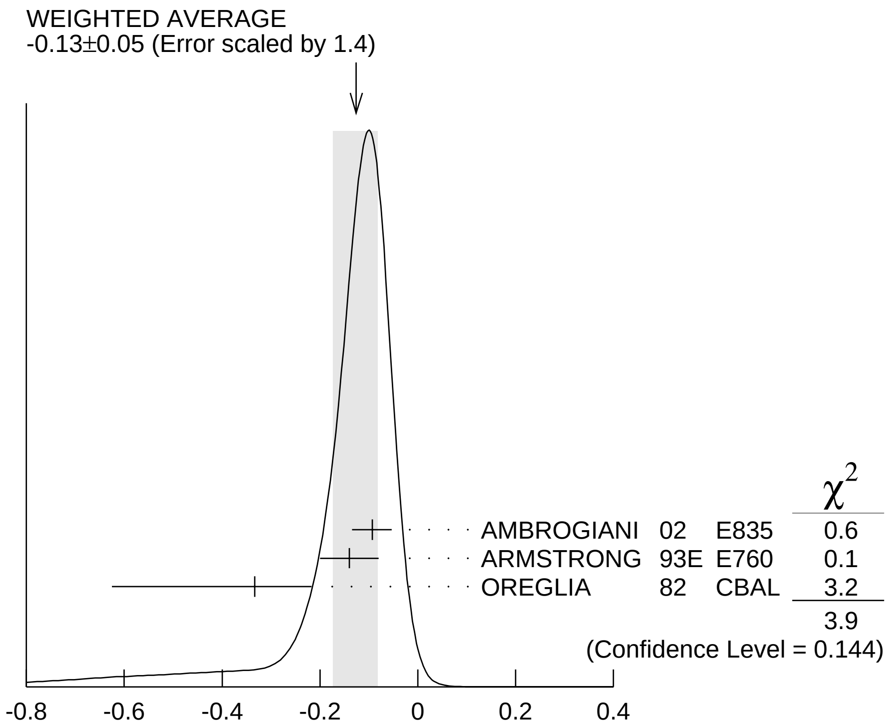
[23] Calculated by us. The value for B($\chi_{c2} \rightarrow 2\pi^+2\pi^-$) reported in BAI 99B is derived using B($\psi(2S) \rightarrow \gamma\chi_{c2}$) = (7.8 ± 0.8)% and B($\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-$) = (32.4 ± 2.6)% [BAI 98D].

[24] 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.

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.		
$-0.093^{+0.039}_{-0.041} \pm 0.006$	5908	[25] AMBROGIANI 02	E835	$p\overline{p} \rightarrow \chi_{c2} \rightarrow J/\psi\gamma$
-0.14 ± 0.06	1904	[25] ARMSTRONG 93E	E760	$p\overline{p} \rightarrow \chi_{c2} \rightarrow J/\psi\gamma$
$-0.333^{+0.116}_{-0.292}$	441	[25] OREGLIA 82	CBAL	$\psi(2S) \rightarrow \chi_{c1}\gamma \rightarrow J/\psi\gamma\gamma$



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

$a_3 = M2/\sqrt{E1^2 + M2^2 + E3^2}$ 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	$p\overline{p} \rightarrow \chi_{c2} \rightarrow J/\psi\gamma$

[25] Assuming a_3=0.

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

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	93B	PR D47 772	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)
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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)

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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)