$\chi_{c1}(1P)$

$I^G(J^{PC}) = 0^+(1^{++})$

See the Review on "Branching Ratios of $\psi(2S)$, $\chi_{c0,1,2}$ and $\eta_c(1S)$" before the $\chi_{c0}(1P)$ Listings.

$\chi_{c1}(1P)$ MASS

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
3510.67 ± 0.05 OUR AVERAGE		Error includes scale factor of 1.2.			
3509.84 ± 0.69 ±0.64	2.8k	AAIJ	23AH	LHCB	$B^+ \to K^+(K^0_S K\pi)$
3508.4 ± 1.9 ±0.7	460	[1] AAIJ	17BB	LHCB	$pp \to b\overline{b}X \to 2(K^+K^-)X$
3510.71 ± 0.04 ±0.09	4.8k	[2] AAIJ	17BI	LHCB	$\chi_{c1} \to J/\psi\mu^+\mu^-$
3510.30 ± 0.14 ±0.16		ABLIKIM	05G	BES2	$\psi(2S) \to \gamma\chi_{c1}$
3510.719± 0.051±0.019		ANDREOTTI	05A	E835	$p\overline{p} \to e^+e^-\gamma$
3509.4 ± 0.9		BAI	99B	BES	$\psi(2S) \to \gamma X$
3510.60 ± 0.087±0.019	513	[3] ARMSTRONG	92	E760	$\overline{p}p \to e^+e^-\gamma$
3511.3 ± 0.4 ±0.4	30	BAGLIN	86B	SPEC	$\overline{p}p \to e^+e^-X$
3512.3 ± 0.3 ±4.0		[4] GAISER	86	CBAL	$\psi(2S) \to \gamma X$
3507.4 ± 1.7	91	[5] LEMOIGNE	82	GOLI	185 π^- Be $\to \gamma\mu^+\mu^-$ A
3510.4 ± 0.6		OREGLIA	82	CBAL	$e^+e^- \to J/\psi 2\gamma$
3510.1 ± 1.1	254	[6] HIMEL	80	MRK2	$e^+e^- \to J/\psi 2\gamma$
3509 ±11	21	BRANDELIK	79B	DASP	$e^+e^- \to J/\psi 2\gamma$
3507 ± 3		[6] BARTEL	78B	CNTR	$e^+e^- \to J/\psi 2\gamma$
3505.0 ± 4 ±4		[6,7] TANENBAUM	78	MRK1	e^+e^-
3513 ± 7	367	[6] BIDDICK	77	CNTR	$\psi(2S) \to \gamma X$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
3500 ±10	40	TANENBAUM	75	MRK1	Hadrons γ

[1] From a fit of the $\phi\phi$ invariant mass with the width of $\chi_{c1}(1P)$ fixed to the PDG 16 value.
[2] AAIJ 17BI reports also $m(\chi_{c2}) - m(\chi_{c1}) = 45.39 \pm 0.07 \pm 0.03$ MeV.
[3] Recalculated by ANDREOTTI 05A, using the value of $\psi(2S)$ mass from AULCHENKO 03.
[4] Using mass of $\psi(2S) = 3686.0$ MeV.
[5] $J/\psi(1S)$ mass constrained to 3097 MeV.
[6] Mass value shifted by us by amount appropriate for $\psi(2S)$ mass = 3686 MeV and $J/\psi(1S)$ mass = 3097 MeV.
[7] From a simultaneous fit to radiative and hadronic decay channels.

$\chi_{c1}(1P)$ WIDTH

VALUE (MeV)	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
0.82 ±0.04 OUR FIT			Error includes scale factor of 1.1.			
0.88 ±0.05 OUR AVERAGE						
1.39 $^{+0.40}_{-0.38}$ $^{+0.26}_{-0.77}$			ABLIKIM	05G	BES2	$\psi(2S) \to \gamma\chi_{c1}$
0.876±0.045±0.026			ANDREOTTI	05A	E835	$p\overline{p} \to e^+e^-\gamma$
0.87 ±0.11 ±0.08		513	[1] ARMSTRONG	92	E760	$\overline{p}p \to e^+e^-\gamma$

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

<1.3	95	BAGLIN	86B	SPEC	$\overline{p}p \to e^+e^- X$
<3.8	90	GAISER	86	CBAL	$\psi(2S) \to \gamma X$

[1] Recalculated by ANDREOTTI 05A.

$\chi_{c1}(1P)$ DECAY MODES

	Mode	Fraction (Γ_i/Γ)	Scale factor/ Confidence level
Γ_1	hadrons		
Γ_2	e^+e^-	$(1.5\ ^{+1.6}_{-1.0}) \times 10^{-7}$	
	Hadronic decays		
Γ_3	$3(\pi^+\pi^-)$	(1.06 ± 0.11) %	S=3.0
Γ_4	$2(\pi^+\pi^-)$	$(6.6\ \pm0.7\ ) \times 10^{-3}$	S=2.4
Γ_5	$\rho^0\pi^+\pi^-$	$(1.6\ \pm1.3\ ) \times 10^{-3}$	
Γ_6	$\pi^+\pi^-\pi^0\pi^0$	(1.18 ± 0.15) %	
Γ_7	$\rho^+\pi^-\pi^0$ + c.c.	(1.44 ± 0.24) %	
Γ_8	$4\pi^0$	$(5.3\ \pm0.8\ ) \times 10^{-4}$	
Γ_9	$\pi^+\pi^-K^+K^-$	$(4.5\ \pm1.0\ ) \times 10^{-3}$	
Γ_{10}	$K^+K^-\pi^0\pi^0$	$(1.10\pm0.27) \times 10^{-3}$	
Γ_{11}	$K^+K^-\pi^+\pi^-\pi^0$	(1.07 ± 0.12) %	
Γ_{12}	$K^0_S K^\pm\pi^\mp\pi^+\pi^-$	$(7.0\ \pm0.7\ ) \times 10^{-3}$	
Γ_{13}	$K^+\pi^-\overline{K}^0\pi^0$ + c.c.	$(8.5\ \pm1.3\ ) \times 10^{-3}$	
Γ_{14}	$\rho^-K^+\overline{K}^0$ + c.c.	$(5.0\ \pm1.2\ ) \times 10^{-3}$	
Γ_{15}	$K^*(892)^0\overline{K}^0\pi^0 \to K^+\pi^-\overline{K}^0\pi^0$ + c.c.	$(2.3\ \pm0.6\ ) \times 10^{-3}$	
Γ_{16}	$K^+K^-\eta\pi^0$	$(1.10\pm0.34) \times 10^{-3}$	
Γ_{17}	$\pi^+\pi^-K^0_S K^0_S$	$(6.8\ \pm2.9\ ) \times 10^{-4}$	
Γ_{18}	$K^+K^-\eta$	$(3.1\ \pm1.0\ ) \times 10^{-4}$	
Γ_{19}	$\overline{K}^0K^+\pi^-$ + c.c.	$(6.9\ \pm0.6\ ) \times 10^{-3}$	S=1.1
Γ_{20}	$K^*(892)^0\overline{K}^0$ + c.c.	$(1.04\pm0.15) \times 10^{-3}$	
Γ_{21}	$K^*(892)^+K^-$ + c.c.	$(1.22\pm0.23) \times 10^{-3}$	
Γ_{22}	$K^*_J(1430)^0\overline{K}^0$ + c.c. $\to K^0_S K^+\pi^-$ + c.c.	$< 8 \times 10^{-4}$	CL=90%
Γ_{23}	$K^*_J(1430)^+K^-$ + c.c. $\to K^0_S K^+\pi^-$ + c.c.	$< 2.1 \times 10^{-3}$	CL=90%
Γ_{24}	$K^+K^-\pi^0$	$(1.80\pm0.24) \times 10^{-3}$	
Γ_{25}	$\eta\pi^+\pi^-$	$(4.57\pm0.23) \times 10^{-3}$	
Γ_{26}	$a_0(980)^+\pi^-$ + c.c. $\to \eta\pi^+\pi^-$	$(3.2\ \pm0.4\ ) \times 10^{-3}$	S=2.1
Γ_{27}	$a_2(1320)^+\pi^-$ + c.c. $\to \eta\pi^+\pi^-$	$(1.74\pm0.24) \times 10^{-4}$	
Γ_{28}	$a_2(1700)^+\pi^-$ + c.c. $\to \eta\pi^+\pi^-$	$(4.6\ \pm0.7\ ) \times 10^{-5}$	
Γ_{29}	$f_2(1270)\eta \to \eta\pi^+\pi^-$	$(3.5\ \pm0.6\ ) \times 10^{-4}$	
Γ_{30}	$f_4(2050)\eta \to \eta\pi^+\pi^-$	$(2.5\ \pm0.9\ ) \times 10^{-5}$	

Γ_{31}	$\pi_1(1400)^+\pi^- +$ c.c. $\to$ $\eta\pi^+\pi^-$	$< 4 \times 10^{-5}$	CL=90%
Γ_{32}	$\pi_1(1600)^+\pi^- +$ c.c. $\to$ $\eta\pi^+\pi^-$	$< 1.5 \times 10^{-5}$	CL=90%
Γ_{33}	$\pi_1(2015)^+\pi^- +$ c.c. $\to$ $\eta\pi^+\pi^-$	$< 8 \times 10^{-6}$	CL=90%
Γ_{34}	$2\pi^+2\pi^-\eta$	$(8.0 \pm 0.8) \times 10^{-3}$	
Γ_{35}	$f_2(1270)\eta$	$(6.6 \pm 1.1) \times 10^{-4}$	
Γ_{36}	$\pi^+\pi^-\eta'$	$(2.2 \pm 0.4) \times 10^{-3}$	
Γ_{37}	$K^+K^-\eta'(958)$	$(8.4 \pm 0.5) \times 10^{-4}$	
Γ_{38}	$K^*_0(1430)^+K^- +$ c.c. $\to$ $K^+K^-\eta'(958)$	$(6.4 {}^{+2.2}_{-2.8}) \times 10^{-4}$	
Γ_{39}	$f_0(980)\eta'(958) \to$ $K^+K^-\eta'(958)$	$(1.6 {}^{+1.4}_{-0.7}) \times 10^{-4}$	
Γ_{40}	$f_0(1710)\eta'(958) \to$ $K^+K^-\eta'(958)$	$(7 {}^{+7}_{-5}) \times 10^{-5}$	
Γ_{41}	$f'_2(1525)\eta'(958) \to$ $K^+K^-\eta'(958)$	$(9 \pm 6) \times 10^{-5}$	
Γ_{42}	$\eta\eta\eta'$	$(1.39 \pm 0.16) \times 10^{-4}$	
Γ_{43}	$K^*_2(1430)^+K^- +$ c.c.	$(1.63 \pm 0.31) \times 10^{-3}$	
Γ_{44}	$K^*_2(1430)\overline{K}^0 +$ c.c.	$(1.18 \pm 0.20) \times 10^{-3}$	
Γ_{45}	$\pi^0 f_0(980) \to \pi^0\pi^+\pi^-$	$(3.5 \pm 0.9) \times 10^{-7}$	
Γ_{46}	$K^+\overline{K}^*(892)^0\pi^- +$ c.c.	$(1.6 \pm 0.9) \times 10^{-3}$	
Γ_{47}	$K^*(892)^0\overline{K}^*(892)^0$	$(1.4 \pm 0.4) \times 10^{-3}$	
Γ_{48}	$K^+K^-K^0_SK^0_S$	$< 4 \times 10^{-4}$	CL=90%
Γ_{49}	$K^0_SK^0_SK^0_SK^0_S$	$(3.5 \pm 1.0) \times 10^{-5}$	
Γ_{50}	$K^+K^-K^+K^-$	$(5.3 \pm 1.1) \times 10^{-4}$	
Γ_{51}	$K^+K^-\phi$	$(4.1 \pm 1.5) \times 10^{-4}$	
Γ_{52}	$\overline{K}^0K^+\pi^-\phi +$ c.c.	$(3.3 \pm 0.5) \times 10^{-3}$	
Γ_{53}	$K^+K^-\pi^0\phi$	$(1.62 \pm 0.30) \times 10^{-3}$	
Γ_{54}	$K^0_SK^0_SK^0_SK^\pm\pi^\mp$	$(2.60 \pm 0.22) \times 10^{-4}$	
Γ_{55}	$3(K^+K^-)$	$(4.2 \pm 1.1) \times 10^{-6}$	
Γ_{56}	$\phi\pi^+\pi^-\pi^0$	$(7.0 \pm 0.9) \times 10^{-4}$	
Γ_{57}	$\omega\omega$	$(6.25 \pm 0.30) \times 10^{-4}$	
Γ_{58}	ωK^+K^-	$(7.3 \pm 0.8) \times 10^{-4}$	
Γ_{59}	$\omega\phi$	$(2.13 \pm 0.30) \times 10^{-5}$	S=1.5
Γ_{60}	$\phi\phi$	$(4.22 \pm 0.20) \times 10^{-4}$	
Γ_{61}	$\phi\phi\eta$	$(2.9 \pm 0.5) \times 10^{-4}$	
Γ_{62}	$p\overline{p}$	$(7.97 \pm 0.29) \times 10^{-5}$	S=1.3
Γ_{63}	$p\overline{p}\pi^0$	$(1.54 \pm 0.18) \times 10^{-4}$	
Γ_{64}	$p\overline{p}\eta$	$(1.44 \pm 0.24) \times 10^{-4}$	
Γ_{65}	$p\overline{p}\omega$	$(2.10 \pm 0.30) \times 10^{-4}$	
Γ_{66}	$p\overline{p}\pi^+\pi^-$	$(5.0 \pm 1.9) \times 10^{-4}$	
Γ_{67}	$p\overline{p}\pi^0\pi^0$	$< 5 \times 10^{-4}$	CL=90%
Γ_{68}	$p\overline{p}\eta\pi^0$	$(1.93 \pm 0.13) \times 10^{-4}$	
Γ_{69}	$p\overline{p}\eta\eta$	$(1.4 \pm 0.4) \times 10^{-5}$	

Γ_{70}	$p\overline{p}K^+K^-$	$(1.86\pm0.12)\times10^{-4}$	
Γ_{71}	$p\overline{p}K^+K^-$ (non-resonant)	$(1.26\pm0.22)\times10^{-4}$	
Γ_{72}	$K^+\overline{p}\Lambda(1520)+$ c.c.	$(1.7\pm0.4)\times10^{-4}$	
Γ_{73}	$\Lambda(1520)\overline{\Lambda}(1520)$	$<9\times10^{-5}$	CL=90%
Γ_{74}	$p\overline{p}\phi$	$<1.7\times10^{-5}$	CL=90%
Γ_{75}	$p\overline{p}K^0_SK^0_S$	$<4\times10^{-4}$	CL=90%
Γ_{76}	$p\overline{p}K^0_SK^-\pi^++$ c.c.	$(4.1\pm0.5)\times10^{-5}$	
Γ_{77}	$p\overline{n}\pi^-$	$(3.8\pm0.5)\times10^{-4}$	
Γ_{78}	$\overline{p}n\pi^+$	$(3.9\pm0.5)\times10^{-4}$	
Γ_{79}	$p\overline{n}\pi^-\pi^0$	$(1.02\pm0.12)\times10^{-3}$	
Γ_{80}	$\overline{p}n\pi^+\pi^0$	$(9.9\pm1.2)\times10^{-4}$	
Γ_{81}	$\Lambda\overline{\Lambda}$	$(1.26\pm0.09)\times10^{-4}$	S=1.1
Γ_{82}	$\Lambda\overline{\Lambda}\pi^+\pi^-$	$(2.9\pm0.5)\times10^{-4}$	
Γ_{83}	$\Lambda\overline{\Lambda}\pi^+\pi^-$ (non-resonant)	$(2.4\pm0.6)\times10^{-4}$	
Γ_{84}	$\Sigma(1385)^+\overline{\Lambda}\pi^-+$ c.c.	$<1.3\times10^{-4}$	CL=90%
Γ_{85}	$\Sigma(1385)^-\overline{\Lambda}\pi^++$ c.c.	$<1.3\times10^{-4}$	CL=90%
Γ_{86}	$\Lambda\overline{\Lambda}\eta$	$(5.8\pm1.5)\times10^{-5}$	
Γ_{87}	$\Lambda\overline{\Lambda}\eta'$	$(1.5\pm0.5)\times10^{-5}$	
Γ_{88}	$\Lambda\overline{\Lambda}\omega$	$(9.9\pm1.5)\times10^{-5}$	
Γ_{89}	$\Lambda\overline{\Lambda}\phi$	$(5.9\pm1.0)\times10^{-5}$	
Γ_{90}	$K^+\overline{p}\Lambda$+c.c.	$(4.1\pm0.4)\times10^{-4}$	S=1.2
Γ_{91}	$nK^0_S\overline{\Lambda}+$ c.c.	$(1.64\pm0.17)\times10^{-4}$	
Γ_{92}	$\overline{p}\Lambda(1520)K^0_S\pi^++$ c.c.	$(4.0\pm0.9)\times10^{-5}$	
Γ_{93}	$K^*(892)^+\overline{p}\Lambda+$ c.c.	$(4.9\pm0.7)\times10^{-4}$	
Γ_{94}	$\Sigma^0\overline{\Sigma}^0$	$(4.2\pm0.6)\times10^{-5}$	
Γ_{95}	$\Sigma^+\overline{p}K^0_S+$ c.c.	$(1.51\pm0.12)\times10^{-4}$	
Γ_{96}	$\Sigma^0\overline{p}K^++$ c.c.	$(1.44\pm0.10)\times10^{-4}$	
Γ_{97}	$\Sigma^+\overline{\Sigma}^-$	$(3.6\pm0.6)\times10^{-5}$	
Γ_{98}	$\Sigma^+\overline{\Sigma}^-\eta$	$(5.0\pm1.4)\times10^{-5}$	
Γ_{99}	$\Sigma^-\overline{\Sigma}^+$	$(5.6\pm1.5)\times10^{-5}$	
Γ_{100}	$\Sigma(1385)^+\overline{\Sigma}(1385)^-$	$<9\times10^{-5}$	CL=90%
Γ_{101}	$\Sigma(1385)^-\overline{\Sigma}(1385)^+$	$<5\times10^{-5}$	CL=90%
Γ_{102}	$K^-\Lambda\overline{\Xi}^++$ c.c.	$(1.34\pm0.24)\times10^{-4}$	
Γ_{103}	$\Xi^0\overline{\Xi}^0$	$(7.4\pm1.2)\times10^{-5}$	
Γ_{104}	$\Xi^-\overline{\Xi}^+$	$(5.9\pm0.6)\times10^{-5}$	
Γ_{105}	$\Omega^-\overline{\Omega}^+$	$(1.47\pm0.25)\times10^{-5}$	
Γ_{106}	$\pi^+\pi^-+K^+K^-$	$<1.5\times10^{-3}$	CL=90%
Γ_{107}	$K^0_SK^0_S$	$<6\times10^{-5}$	CL=90%
Γ_{108}	$\eta_c\pi^+\pi^-$	$<3.1\times10^{-4}$	CL=90%

Radiative decays

Γ_{109}	$\gamma J/\psi(1S)$	(33.9 ± 1.2) %	S=1.3
Γ_{110}	$\gamma\rho^0$	$(2.14\pm0.17)\times10^{-4}$	
Γ_{111}	$\gamma\omega$	$(6.7\pm0.8)\times10^{-5}$	

Γ_{112}	$\gamma\phi$	$(2.4 \pm 0.5) \times 10^{-5}$	
Γ_{113}	$\gamma\gamma$	$< 6 \times 10^{-6}$	CL=90%
Γ_{114}	$e^+e^- J/\psi(1S)$	$(3.42 \pm 0.23) \times 10^{-3}$	
Γ_{115}	$\mu^+\mu^- J/\psi(1S)$	$(2.30 \pm 0.29) \times 10^{-4}$	

CONSTRAINED FIT INFORMATION

A multiparticle fit to $\chi_{c1}(1P)$, $\chi_{c0}(1P)$, $\chi_{c2}(1P)$, and $\psi(2S)$ with 4 total widths, a partial width, 27 combinations of partial widths obtained from integrated cross section, and 87 branching ratios uses 263 measurements to determine 50 parameters. The overall fit has a $\chi^2 = 435.4$ for 213 degrees of freedom.

The following *off-diagonal* array elements are the correlation coefficients $\left\langle\delta p_i \delta p_j\right\rangle/(\delta p_i \cdot \delta p_j)$, in percent, from the fit to parameters p_i, including the branching fractions, $x_i \equiv \Gamma_i/\Gamma_{total}$.

	x_{19}	x_{50}	x_{62}	x_{81}	x_{109}
x_{50}	4				
x_{62}	15	6			
x_{81}	11	5	17		
x_{109}	17	7	13	20	
Γ	−16	−7	−58	−18	−55

$\chi_{c1}(1P)$ PARTIAL WIDTHS

$\Gamma(e^+e^-)$ — Γ_2

VALUE (eV)	EVTS	DOCUMENT ID		TECN	COMMENT
$0.12^{+0.13}_{-0.08}$	250	[1] ABLIKIM	22AF	BES3	$e^+e^- \to \chi_{c1} \to \gamma J/\psi$

[1] Assuming $\Gamma(\chi_{c1} \to \gamma J/\psi) = 0.28$ MeV.

$\chi_{c1}(1P)$ $\Gamma(i)\Gamma(\gamma J/\psi(1S))/\Gamma(total)$

$\Gamma(p\overline{p}) \times \Gamma(\gamma J/\psi(1S))/\Gamma_{total}$ — $\Gamma_{62}\Gamma_{109}/\Gamma$

VALUE (eV)	DOCUMENT ID		TECN	COMMENT
22.1±0.8 OUR FIT				
21.4±0.9 OUR AVERAGE				
21.5±0.5±0.8	[1] ANDREOTTI	05A	E835	$p\overline{p} \to e^+e^-\gamma$
21.4±1.5±2.2	[1,2] ARMSTRONG	92	E760	$\overline{p}p \to e^+e^-\gamma$
$19.9^{+4.4}_{-4.0}$	[1] BAGLIN	86B	SPEC	$\overline{p}p \to e^+e^- X$

[1] Calculated by us using $B(J/\psi(1S) \to e^+e^-) = 0.0593 \pm 0.0010$.
[2] Recalculated by ANDREOTTI 05A.

$\chi_{c1}(1P)$ BRANCHING RATIOS

HADRONIC DECAYS

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

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
10.6 ±1.1 OUR AVERAGE	Error includes scale factor of 3.0.				
10.81±0.23±0.29	84k	[1] ABLIKIM	22Q	BES3	$\psi(2S) \to \gamma 3(\pi^+\pi^-)$
5.1 ±1.1 ±0.1	98	[2] BAI	99B	BES	$\psi(2S) \to \gamma\chi_{c1}$
19 ±7 ±1	48	[3] TANENBAUM	78	MRK1	$\psi(2S) \to \gamma\chi_{c1}$

[1] ABLIKIM 22Q reports $(1.092 \pm 0.004 \pm 0.035) \times 10^{-2}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to 3(\pi^+\pi^-))/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.75 \pm 0.24) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

[2] BAI 99B reports $(5.8 \pm 0.7 \pm 1.2) \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to 3(\pi^+\pi^-))/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (8.7 \pm 0.8) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

[3] TANENBAUM 78 reports $[\Gamma(\chi_{c1}(1P) \to 3(\pi^+\pi^-))/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))] = (1.9 \pm 0.7) \times 10^{-3}$ which we divide by our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(2(\pi^+\pi^-))/\Gamma_{total}$ Γ_4/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
6.6 ±0.7 OUR AVERAGE	Error includes scale factor of 2.4.				
6.78±0.26±0.18	670k	[1] ABLIKIM	24BT	BES3	$\psi(2S) \to \gamma\chi_{c1}$
4.0 ±0.9 ±0.1	277	[2] BAI	99B	BES	$\psi(2S) \to \gamma\chi_{c1}$
14.2 ±4.1 ±0.4	74	[3] TANENBAUM	78	MRK1	$\psi(2S) \to \gamma\chi_{c1}$

[1] ABLIKIM 24BT reports $(0.685 \pm 0.001 \pm 0.031) \times 10^{-2}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to 2(\pi^+\pi^-))/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.75 \pm 0.24) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

[2] BAI 99B reports $(0.49 \pm 0.04 \pm 0.12) \times 10^{-2}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to 2(\pi^+\pi^-))/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))] \times [B(\psi(2S) \to J/\psi(1S)\pi^+\pi^-)]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (8.7 \pm 0.8) \times 10^{-2}$, $B(\psi(2S) \to J/\psi(1S)\pi^+\pi^-) = (32.4 \pm 2.6) \times 10^{-2}$, which we rescale to our best (shown rounded) values $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$, $B(\psi(2S) \to J/\psi(1S)\pi^+\pi^-) = (34.78 \pm 0.33) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) values.

[3] TANENBAUM 78 reports $[\Gamma(\chi_{c1}(1P) \to 2(\pi^+\pi^-))/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))] = (1.4 \pm 0.4) \times 10^{-3}$ which we divide by our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(\rho^0\pi^+\pi^-)/\Gamma_{total}$ Γ_5/Γ

VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
3.9±3.5	[1] TANENBAUM 78	MRK1	$\psi(2S) \to \gamma\chi_{c1}$

[1] Estimated using B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = 0.087. The errors do not contain the uncertainty in the $\psi(2S)$ decay.

$\Gamma(\rho^0\pi^+\pi^-)/\Gamma(2(\pi^+\pi^-))$ Γ_5/Γ_4

VALUE	DOCUMENT ID	TECN	COMMENT
0.24±0.20	TANENBAUM 78	MRK1	$\psi(2S) \to \gamma\chi_{c1}$

$\Gamma(\pi^+\pi^-\pi^0\pi^0)/\Gamma_{total}$ Γ_6/Γ

VALUE (%)	EVTS	DOCUMENT ID	TECN	COMMENT
1.18±0.15±0.03	604.7	[1] HE 08B	CLEO	$e^+e^- \to \gamma h^+h^-h^0h^0$

[1] HE 08B reports 1.28 ± 0.06 ± 0.15 ± 0.08 % from a measurement of [$\Gamma(\chi_{c1}(1P) \to \pi^+\pi^-\pi^0\pi^0)/\Gamma_{total}$] × [B($\psi(2S) \to \gamma\chi_{c1}(1P)$)] assuming B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = (9.07 ± 0.11 ± 0.54) × 10^{-2}, which we rescale to our best (shown rounded) value B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = (9.85 ± 0.26) × 10^{-2}. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(\rho^+\pi^-\pi^0 + c.c.)/\Gamma_{total}$ Γ_7/Γ

VALUE (%)	EVTS	DOCUMENT ID	TECN	COMMENT
1.44±0.24±0.04	712.3	[1,2] HE 08B	CLEO	$e^+e^- \to \gamma h^+h^-h^0h^0$

[1] HE 08B reports 1.56 ± 0.13 ± 0.22 ± 0.10 % from a measurement of [$\Gamma(\chi_{c1}(1P) \to \rho^+\pi^-\pi^0 +$ c.c.$)/\Gamma_{total}$] × [B($\psi(2S) \to \gamma\chi_{c1}(1P)$)] assuming B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = (9.07 ± 0.11 ± 0.54) × 10^{-2}, which we rescale to our best (shown rounded) value B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = (9.85 ± 0.26) × 10^{-2}. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

[2] Calculated by us. We have added the values from HE 08B for $\rho^+\pi^-\pi^0$ and $\rho^-\pi^+\pi^0$ decays assuming uncorrelated statistical and fully correlated systematic uncertainties.

$\Gamma(4\pi^0)/\Gamma_{total}$ Γ_8/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
5.3±0.8±0.1	608	[1] ABLIKIM 11A	BES3	$e^+e^- \to \psi(2S) \to \gamma\chi_{c1}$

[1] ABLIKIM 11A reports (0.57 ± 0.03 ± 0.08) × 10^{-3} from a measurement of [$\Gamma(\chi_{c1}(1P) \to 4\pi^0)/\Gamma_{total}$] × [B($\psi(2S) \to \gamma\chi_{c1}(1P)$)] assuming B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = (9.2 ± 0.4) × 10^{-2}, which we rescale to our best (shown rounded) value B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = (9.85 ± 0.26) × 10^{-2}. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

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

VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
4.5±1.0 OUR EVALUATION	Treating systematic error as correlated.		
4.5±0.9 OUR AVERAGE			
4.2±0.4±0.9	[1] BAI 99B	BES	$\psi(2S) \to \gamma\chi_{c1}$
7.3±3.0±0.4	[1] TANENBAUM 78	MRK1	$\psi(2S) \to \gamma\chi_{c1}$

[1] Rescaled by us using B($\psi(2S) \to \gamma\chi_{c1}$) = (8.8 ± 0.4)% and B($\psi(2S) \to J/\psi(1S)\pi^+\pi^-$) = (32.6 ± 0.5)%.

$\Gamma(K^+K^-\pi^0\pi^0)/\Gamma_{total}$ — Γ_{10}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
1.10±0.27±0.03	45.1	[1] HE	08B	CLEO	$e^+e^- \to \gamma h^+h^-h^0h^0$

[1] HE 08B reports $(0.12\pm0.02\pm0.02\pm0.01)\times10^{-2}$ from a measurement of [$\Gamma(\chi_{c1}(1P) \to K^+K^-\pi^0\pi^0)/\Gamma_{total}$] × [B($\psi(2S) \to \gamma\chi_{c1}(1P)$)] assuming B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = $(9.07 \pm 0.11 \pm 0.54) \times 10^{-2}$, which we rescale to our best (shown rounded) value B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = $(9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(K^+K^-\pi^+\pi^-\pi^0)/\Gamma_{total}$ — Γ_{11}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
10.7±1.1±0.3	12k	[1] ABLIKIM	13B	BES3	$e^+e^- \to \psi(2S) \to \gamma\chi_{c1}$

[1] ABLIKIM 13B reports $(11.46 \pm 0.12 \pm 1.29) \times 10^{-3}$ from a measurement of [$\Gamma(\chi_{c1}(1P) \to K^+K^-\pi^+\pi^-\pi^0)/\Gamma_{total}$] × [B($\psi(2S) \to \gamma\chi_{c1}(1P)$)] assuming B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = $(9.2 \pm 0.4) \times 10^{-2}$, which we rescale to our best (shown rounded) value B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = $(9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(K^0_S K^\pm\pi^\mp\pi^+\pi^-)/\Gamma_{total}$ — Γ_{12}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
7.0±0.7±0.2	5.1k	[1] ABLIKIM	13B	BES3	$e^+e^- \to \psi(2S) \to \gamma\chi_{c1}$

[1] ABLIKIM 13B reports $(7.52\pm0.11\pm0.79)\times10^{-3}$ from a measurement of [$\Gamma(\chi_{c1}(1P) \to K^0_S K^\pm\pi^\mp\pi^+\pi^-)/\Gamma_{total}$] × [B($\psi(2S) \to \gamma\chi_{c1}(1P)$)] assuming B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = $(9.2 \pm 0.4) \times 10^{-2}$, which we rescale to our best (shown rounded) value B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = $(9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(K^+\pi^-\overline{K}^0\pi^0 + c.c.)/\Gamma_{total}$ — Γ_{13}/Γ

VALUE (%)	EVTS	DOCUMENT ID		TECN	COMMENT
0.85±0.13±0.02	141.3	[1] HE	08B	CLEO	$e^+e^- \to \gamma h^+h^-h^0h^0$

[1] HE 08B reports 0.92 ± 0.09 ± 0.11 ± 0.06 % from a measurement of [$\Gamma(\chi_{c1}(1P) \to K^+\pi^-\overline{K}^0\pi^0 +$ c.c.$)/\Gamma_{total}$] × [B($\psi(2S) \to \gamma\chi_{c1}(1P)$)] assuming B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = $(9.07 \pm 0.11 \pm 0.54) \times 10^{-2}$, which we rescale to our best (shown rounded) value B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = $(9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

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

VALUE (%)	EVTS	DOCUMENT ID		TECN	COMMENT
0.50±0.12±0.01	141.3	[1] HE	08B	CLEO	$e^+e^- \to \gamma h^+h^-h^0h^0$

[1] HE 08B reports 0.54 ± 0.11 ± 0.07 ± 0.03 % from a measurement of [$\Gamma(\chi_{c1}(1P) \to \rho^- K^+ \overline{K}^0 +$ c.c.$)/\Gamma_{total}$] × [B($\psi(2S) \to \gamma\chi_{c1}(1P)$)] assuming B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = (9.07 ± 0.11 ± 0.54) × 10^{-2}, which we rescale to our best (shown rounded) value B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = (9.85 ± 0.26) × 10^{-2}. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(K^*(892)^0 \overline{K}^0 \pi^0 \to K^+ \pi^- \overline{K}^0 \pi^0 + \text{c.c.})/\Gamma_{total}$ — Γ_{15}/Γ

VALUE (%)	EVTS	DOCUMENT ID		TECN	COMMENT
0.23±0.06±0.01	141.3	[1] HE	08B	CLEO	$e^+e^- \to \gamma h^+ h^- h^0 h^0$

[1] HE 08B reports 0.25 ± 0.06 ± 0.03 ± 0.02 % from a measurement of [$\Gamma(\chi_{c1}(1P) \to K^*(892)^0 \overline{K}^0 \pi^0 \to K^+ \pi^- \overline{K}^0 \pi^0 +$ c.c.$)/\Gamma_{total}$] × [B($\psi(2S) \to \gamma\chi_{c1}(1P)$)] assuming B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = (9.07 ± 0.11 ± 0.54) × 10^{-2}, which we rescale to our best (shown rounded) value B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = (9.85 ± 0.26) × 10^{-2}. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

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

VALUE (%)	EVTS	DOCUMENT ID		TECN	COMMENT
0.110±0.034±0.003	141.3	[1] HE	08B	CLEO	$e^+e^- \to \gamma h^+ h^- h^0 h^0$

[1] HE 08B reports 0.12 ± 0.03 ± 0.02 ± 0.01 % from a measurement of [$\Gamma(\chi_{c1}(1P) \to K^+ K^- \eta \pi^0)/\Gamma_{total}$] × [B($\psi(2S) \to \gamma\chi_{c1}(1P)$)] assuming B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = (9.07 ± 0.11 ± 0.54) × 10^{-2}, which we rescale to our best (shown rounded) value B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = (9.85 ± 0.26) × 10^{-2}. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

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

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
6.8±2.9±0.2	19.8 ± 7.7	[1] ABLIKIM	05O	BES2	$\psi(2S) \to \chi_{c1}\gamma$

[1] ABLIKIM 05O reports [$\Gamma(\chi_{c1}(1P) \to \pi^+ \pi^- K^0_S K^0_S)/\Gamma_{total}$] × [B($\psi(2S) \to \gamma\chi_{c1}(1P)$)] = (0.67 ± 0.26 ± 0.11) × 10^{-4} which we divide by our best (shown rounded) value B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = (9.85 ± 0.26) × 10^{-2}. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

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

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
3.1 ±1.0 ±0.1		[1] ATHAR	07	CLEO	$\psi(2S) \to \gamma h^+ h^- h^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
4.30±0.05	8690	[2] ABLIKIM	24BW	BES3	$\psi(2S) \to \gamma\chi_{c1}$

[1] ATHAR 07 reports (0.34 ± 0.10 ± 0.04) × 10^{-3} from a measurement of [$\Gamma(\chi_{c1}(1P) \to K^+ K^- \eta)/\Gamma_{total}$] × [B($\psi(2S) \to \gamma\chi_{c1}(1P)$)] assuming B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = 0.0907 ± 0.0011 ± 0.0054, which we rescale to our best (shown rounded) value B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = (9.85 ± 0.26) × 10^{-2}. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

[2] No systematic error reported.

$\Gamma(K^*(892)^0 \overline{K}^0 + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{20}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
1.04±0.15 OUR AVERAGE					
1.05±0.14±0.09	262	[1] AAIJ	23AH	LHCB	$B^+ \to K^+(K^0_S K\pi)$
0.97±0.36±0.03	22	[2] ABLIKIM	06R	BES2	$\psi(2S) \to \gamma\chi_{c1}$

[1] AAIJ 23AH reports $(1.04 \pm 0.13 \pm 0.04 \pm 0.09) \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to K^*(892)^0 \overline{K}^0 + \text{c.c.})/\Gamma_{\text{total}}] \times [B(\chi_{c1}(1P) \to \overline{K}^0 K^+ \pi^- + \text{c.c.})]$ assuming $B(\chi_{c1}(1P) \to \overline{K}^0 K^+ \pi^- + \text{c.c.}) = (7.0 \pm 0.6) \times 10^{-3}$, which we rescale to our best (shown rounded) value $B(\chi_{c1}(1P) \to \overline{K}^0 K^+ \pi^- + \text{c.c.}) = (6.9 \pm 0.6) \times 10^{-3}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

[2] ABLIKIM 06R reports $(1.1 \pm 0.4 \pm 0.1) \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to K^*(892)^0 \overline{K}^0 + \text{c.c.})/\Gamma_{\text{total}}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (8.7 \pm 0.4) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(K^*(892)^+ K^- + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{21}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
1.22±0.23 OUR AVERAGE					
1.19±0.22±0.10	288	[1] AAIJ	23AH	LHCB	$B^+ \to K^+(K^0_S K\pi)$
1.41±0.64±0.04	27	[2] ABLIKIM	06R	BES2	$\psi(2S) \to \gamma\chi_{c1}$

[1] AAIJ 23AH reports $(1.18 \pm 0.17 \pm 0.14 \pm 0.10) \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to K^*(892)^+ K^- + \text{c.c.})/\Gamma_{\text{total}}] \times [B(\chi_{c1}(1P) \to \overline{K}^0 K^+ \pi^- + \text{c.c.})]$ assuming $B(\chi_{c1}(1P) \to \overline{K}^0 K^+ \pi^- + \text{c.c.}) = (7.0 \pm 0.6) \times 10^{-3}$, which we rescale to our best (shown rounded) value $B(\chi_{c1}(1P) \to \overline{K}^0 K^+ \pi^- + \text{c.c.}) = (6.9 \pm 0.6) \times 10^{-3}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

[2] ABLIKIM 06R reports $(1.6 \pm 0.7 \pm 0.2) \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to K^*(892)^+ K^- + \text{c.c.})/\Gamma_{\text{total}}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (8.7 \pm 0.4) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(K^*_J(1430)^0 \overline{K}^0 + \text{c.c.} \to K^0_S K^+ \pi^- + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{22}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<8 × 10^−4	90	[1] ABLIKIM	06R	BES2	$\psi(2S) \to \gamma\chi_{c1}$

[1] ABLIKIM 06R reports $< 0.9 \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to K^*_J(1430)^0 \overline{K}^0 + \text{c.c.} \to K^0_S K^+ \pi^- + \text{c.c.})/\Gamma_{\text{total}}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (8.7 \pm 0.4) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = 9.85 \times 10^{-2}$.

$\Gamma(K^*_J(1430)^+ K^- + \text{c.c.} \to K^0_S K^+ \pi^- + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{23}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<2.1 × 10^−3	90	[1] ABLIKIM	06R	BES2	$\psi(2S) \to \gamma\chi_{c1}$

[1] ABLIKIM 06R reports $< 2.4 \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to K^*_J(1430)^+ K^- + \text{c.c.} \to K^0_S K^+ \pi^- + \text{c.c.})/\Gamma_{\text{total}}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (8.7 \pm 0.4) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = 9.85 \times 10^{-2}$.

$\Gamma(K^+ K^- \pi^0)/\Gamma_{\text{total}}$ — Γ_{24}/Γ

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
1.80±0.23±0.05	[1] ATHAR	07	CLEO	$\psi(2S) \to \gamma h^+ h^- h^0$

[1] ATHAR 07 reports $(1.95 \pm 0.16 \pm 0.23) \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to K^+ K^- \pi^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = 0.0907 \pm 0.0011 \pm 0.0054$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(\eta\pi^+\pi^-)/\Gamma_{\text{total}}$ — Γ_{25}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
4.57±0.23 OUR AVERAGE					
4.53±0.23±0.12		[1,2] ABLIKIM	17K	BES3	$\psi(2S) \to \gamma\eta\pi^+\pi^-$
4.6 ±0.5 ±0.1		[3] ATHAR	07	CLEO	$\psi(2S) \to \gamma h^+ h^- h^0$
5.2 ±0.9 ±0.1	222	[4] ABLIKIM	06R	BES2	$\psi(2S) \to \gamma\chi_{c1}$

[1] From an amplitude analysis using an isobar model.

[2] ABLIKIM 17K reports $(4.67 \pm 0.03 \pm 0.23 \pm 0.16) \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to \eta\pi^+\pi^-)/\Gamma_{\text{total}}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.55 \pm 0.31) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

[3] ATHAR 07 reports $(5.0 \pm 0.3 \pm 0.5) \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to \eta\pi^+\pi^-)/\Gamma_{\text{total}}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = 0.0907 \pm 0.0011 \pm 0.0054$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

[4] ABLIKIM 06R reports $(5.9 \pm 0.7 \pm 0.8) \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to \eta\pi^+\pi^-)/\Gamma_{\text{total}}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (8.7 \pm 0.4) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(a_0(980)^+\pi^- + \text{c.c.} \to \eta\pi^+\pi^-)/\Gamma_{\text{total}}$ — Γ_{26}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
3.2 ±0.4 OUR AVERAGE	Error includes scale factor of 2.1.				
3.30±0.19±0.09		[1,2] ABLIKIM	17K	BES3	$\psi(2S) \to \gamma\eta\pi^+\pi^-$
1.77±0.62±0.05	58	[3] ABLIKIM	06R	BES2	$\psi(2S) \to \gamma\chi_{c1}$

[1] From an amplitude analysis using an isobar model.

[2] ABLIKIM 17K reports $(3.40 \pm 0.03 \pm 0.19 \pm 0.11) \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to a_0(980)^+\pi^- + \text{c.c.} \to \eta\pi^+\pi^-)/\Gamma_{\text{total}}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.55 \pm 0.31) \times 10^{-2}$, which we rescale to our

best (shown rounded) value B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = $(9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

[3] ABLIKIM 06R reports $(2.0 \pm 0.5 \pm 0.5) \times 10^{-3}$ from a measurement of [$\Gamma(\chi_{c1}(1P) \to a_0(980)^+\pi^- +$ c.c. $\to \eta\pi^+\pi^-)/\Gamma_{total}$] × [B($\psi(2S) \to \gamma\chi_{c1}(1P)$)] assuming B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = $(8.7 \pm 0.4) \times 10^{-2}$, which we rescale to our best (shown rounded) value B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = $(9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(a_2(1320)^+\pi^- + \text{c.c.} \to \eta\pi^+\pi^-)/\Gamma_{total}$ Γ_{27}/Γ

VALUE (units 10^{-3})	*DOCUMENT ID*		*TECN*	*COMMENT*
0.174±0.023±0.005	[1,2] ABLIKIM	17K	BES3	$\psi(2S) \to \gamma\eta\pi^+\pi^-$

[1] From an amplitude analysis using an isobar model.

[2] ABLIKIM 17K reports $(0.18 \pm 0.01 \pm 0.02 \pm 0.01) \times 10^{-3}$ from a measurement of [$\Gamma(\chi_{c1}(1P) \to a_2(1320)^+\pi^- +$ c.c. $\to \eta\pi^+\pi^-)/\Gamma_{total}$] × [B($\psi(2S) \to \gamma\chi_{c1}(1P)$)] assuming B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = $(9.55 \pm 0.31) \times 10^{-2}$, which we rescale to our best (shown rounded) value B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = $(9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(a_2(1700)^+\pi^- + \text{c.c.} \to \eta\pi^+\pi^-)/\Gamma_{total}$ Γ_{28}/Γ

VALUE (units 10^{-5})	*DOCUMENT ID*		*TECN*	*COMMENT*
4.6±0.7±0.1	[1,2] ABLIKIM	17K	BES3	$\psi(2S) \to \gamma\eta\pi^+\pi^-$

[1] From an amplitude analysis using an isobar model.

[2] ABLIKIM 17K reports $(4.7 \pm 0.4 \pm 0.6 \pm 0.2) \times 10^{-5}$ from a measurement of [$\Gamma(\chi_{c1}(1P) \to a_2(1700)^+\pi^- +$ c.c. $\to \eta\pi^+\pi^-)/\Gamma_{total}$] × [B($\psi(2S) \to \gamma\chi_{c1}(1P)$)] assuming B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = $(9.55 \pm 0.31) \times 10^{-2}$, which we rescale to our best (shown rounded) value B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = $(9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(f_2(1270)\eta \to \eta\pi^+\pi^-)/\Gamma_{total}$ Γ_{29}/Γ

VALUE (units 10^{-4})	*DOCUMENT ID*		*TECN*	*COMMENT*
3.5±0.6±0.1	[1,2] ABLIKIM	17K	BES3	$\psi(2S) \to \gamma\eta\pi^+\pi^-$

[1] From an amplitude analysis using an isobar model.

[2] ABLIKIM 17K reports $(0.36 \pm 0.01 \pm 0.06 \pm 0.01) \times 10^{-3}$ from a measurement of [$\Gamma(\chi_{c1}(1P) \to f_2(1270)\eta \to \eta\pi^+\pi^-)/\Gamma_{total}$] × [B($\psi(2S) \to \gamma\chi_{c1}(1P)$)] assuming B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = $(9.55 \pm 0.31) \times 10^{-2}$, which we rescale to our best (shown rounded) value B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = $(9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(f_4(2050)\eta \to \eta\pi^+\pi^-)/\Gamma_{total}$ Γ_{30}/Γ

VALUE (units 10^{-5})	*DOCUMENT ID*		*TECN*	*COMMENT*
2.5±0.9±0.1	[1,2] ABLIKIM	17K	BES3	$\psi(2S) \to \gamma\eta\pi^+\pi^-$

[1] From an amplitude analysis using an isobar model.

[2] ABLIKIM 17K reports $(2.6 \pm 0.4 \pm 0.8 \pm 0.1) \times 10^{-5}$ from a measurement of [$\Gamma(\chi_{c1}(1P) \to f_4(2050)\eta \to \eta\pi^+\pi^-)/\Gamma_{total}$] × [B($\psi(2S) \to \gamma\chi_{c1}(1P)$)] assuming

B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = $(9.55 \pm 0.31) \times 10^{-2}$, which we rescale to our best (shown rounded) value B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = $(9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma\big(\pi_1(1400)^+\pi^- + \text{c.c.} \to \eta\pi^+\pi^-\big)/\Gamma_{\text{total}}$ — Γ_{31}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<4 × 10^{-5}	90	[1,2] ABLIKIM	17K	BES3	$\psi(2S) \to \gamma\eta\pi^+\pi^-$

[1] From an amplitude analysis using an isobar model.

[2] ABLIKIM 17K reports $< 4.6 \times 10^{-5}$ from a measurement of [$\Gamma\big(\chi_{c1}(1P) \to \pi_1(1400)^+\pi^- + \text{c.c.} \to \eta\pi^+\pi^-\big)/\Gamma_{\text{total}}$] × [B($\psi(2S) \to \gamma\chi_{c1}(1P)$)] assuming B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = $(9.55 \pm 0.31) \times 10^{-2}$, which we rescale to our best (shown rounded) value B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = 9.85×10^{-2}.

$\Gamma\big(\pi_1(1600)^+\pi^- + \text{c.c.} \to \eta\pi^+\pi^-\big)/\Gamma_{\text{total}}$ — Γ_{32}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<1.5 × 10^{-5}	90	[1,2] ABLIKIM	17K	BES3	$\psi(2S) \to \gamma\eta\pi^+\pi^-$

[1] From an amplitude analysis using an isobar model.

[2] ABLIKIM 17K reports $< 1.5 \times 10^{-5}$ from a measurement of [$\Gamma\big(\chi_{c1}(1P) \to \pi_1(1600)^+\pi^- + \text{c.c.} \to \eta\pi^+\pi^-\big)/\Gamma_{\text{total}}$] × [B($\psi(2S) \to \gamma\chi_{c1}(1P)$)] assuming B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = $(9.55 \pm 0.31) \times 10^{-2}$, which we rescale to our best (shown rounded) value B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = 9.85×10^{-2}.

$\Gamma\big(\pi_1(2015)^+\pi^- + \text{c.c.} \to \eta\pi^+\pi^-\big)/\Gamma_{\text{total}}$ — Γ_{33}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<8 × 10^{-6}	90	[1,2] ABLIKIM	17K	BES3	$\psi(2S) \to \gamma\eta\pi^+\pi^-$

[1] From an amplitude analysis using an isobar model.

[2] ABLIKIM 17K reports $< 8 \times 10^{-6}$ from a measurement of [$\Gamma\big(\chi_{c1}(1P) \to \pi_1(2015)^+\pi^- + \text{c.c.} \to \eta\pi^+\pi^-\big)/\Gamma_{\text{total}}$] × [B($\psi(2S) \to \gamma\chi_{c1}(1P)$)] assuming B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = $(9.55 \pm 0.31) \times 10^{-2}$, which we rescale to our best (shown rounded) value B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = 9.85×10^{-2}.

$\Gamma\big(f_2(1270)\eta\big)/\Gamma_{\text{total}}$ — Γ_{35}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
0.66±0.11 OUR AVERAGE					
0.62±0.10±0.02		[1,2] ABLIKIM	17K	BES3	$\psi(2S) \to \gamma\eta\pi^+\pi^-$
2.6 ±0.7 ±0.1	53	[3] ABLIKIM	06R	BES2	$\psi(2S) \to \gamma\chi_{c1}$

[1] ABLIKIM 17K reports $(6.4 \pm 1.1) \times 10^{-4}$ from a measurement of [$\Gamma\big(\chi_{c1}(1P) \to f_2(1270)\eta\big)/\Gamma_{\text{total}}$] × [B($\psi(2S) \to \gamma\chi_{c1}(1P)$)] assuming B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = $(9.55 \pm 0.31) \times 10^{-2}$, which we rescale to our best (shown rounded) value B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = $(9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

[2] From an amplitude analysis using an isobar model.

[3] ABLIKIM 06R reports $(3.0 \pm 0.7 \pm 0.5) \times 10^{-3}$ from a measurement of [$\Gamma\big(\chi_{c1}(1P) \to f_2(1270)\eta\big)/\Gamma_{\text{total}}$] × [B($\psi(2S) \to \gamma\chi_{c1}(1P)$)] assuming B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = $(8.7 \pm 0.4) \times 10^{-2}$, which we rescale to our best (shown rounded) value B($\psi(2S) \to \gamma\chi_{c1}(1P)$) = $(9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

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

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
2.2±0.4±0.1	[1] ATHAR	07	CLEO	$\psi(2S) \to \gamma h^+ h^- h^0$

[1] ATHAR 07 reports $(2.4 \pm 0.4 \pm 0.3) \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to \pi^+\pi^-\eta')/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = 0.0907 \pm 0.0011 \pm 0.0054$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(K^+K^-\eta'(958))/\Gamma_{total}$ Γ_{37}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
8.4±0.4±0.2		[1] ABLIKIM	25I	BES3	$\psi(2S) \to \gamma K^+K^-\eta'(958)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
8.2±0.7±0.2	529	[2,3] ABLIKIM	14J	BES3	$\psi(2S) \to \gamma K^+K^-\eta'(958)$

[1] ABLIKIM 25I reports $(8.48 \pm 0.10 \pm 0.47) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to K^+K^-\eta'(958))/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.75 \pm 0.24) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

[2] ABLIKIM 14J reports $(8.75 \pm 0.87) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to K^+K^-\eta'(958))/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.2 \pm 0.4) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

[3] Superseded by ABLIKIM 25I.

$\Gamma(K_0^*(1430)^+K^- + c.c. \to K^+K^-\eta'(958))/\Gamma_{total}$ Γ_{38}/Γ

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
$6.41 \pm 0.57^{+2.09}_{-2.71}$	[1] ABLIKIM	14J	BES3	$\psi(2S) \to \gamma K^+K^-\eta'(958)$

[1] From an overall fit to all the intermediate states of $K^+K^-\eta'(958)$ which yields $B(\chi_{c1} \to K^+K^-\eta'(958)) = (8.75 \pm 0.87) \times 10^{-4}$.

$\Gamma(f_0(980)\eta'(958) \to K^+K^-\eta'(958))/\Gamma_{total}$ Γ_{39}/Γ

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
$1.65 \pm 0.47^{+1.32}_{-0.56}$	[1] ABLIKIM	14J	BES3	$\psi(2S) \to \gamma K^+K^-\eta'(958)$

[1] From an overall fit to all the intermediate states of $K^+K^-\eta'(958)$ which yields $B(\chi_{c1} \to K^+K^-\eta'(958)) = (8.75 \pm 0.87) \times 10^{-4}$.

$\Gamma(f_0(1710)\eta'(958) \to K^+K^-\eta'(958))/\Gamma_{total}$ Γ_{40}/Γ

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
$0.71 \pm 0.22^{+0.68}_{-0.48}$	[1] ABLIKIM	14J	BES3	$\psi(2S) \to \gamma K^+K^-\eta'(958)$

[1] From an overall fit to all the intermediate states of $K^+ K^- \eta'(958)$ which yields B($\chi_{c1} \to K^+ K^- \eta'(958)$) = $(8.75 \pm 0.87) \times 10^{-4}$.

$\Gamma(f_2'(1525)\eta'(958) \to K^+ K^- \eta'(958))/\Gamma_{total}$ — Γ_{41}/Γ

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
$\mathbf{0.92 \pm 0.23^{+0.55}_{-0.51}}$	[1] ABLIKIM	14J	BES3	$\psi(2S) \to \gamma K^+ K^- \eta'(958)$

[1] From an overall fit to all the intermediate states of $K^+ K^- \eta'(958)$ which yields B($\chi_{c1} \to K^+ K^- \eta'(958)$) = $(8.75 \pm 0.87) \times 10^{-4}$.

$\Gamma(\eta\eta\eta')/\Gamma_{total}$ — Γ_{42}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
1.39±0.15±0.04	37K	[1] ABLIKIM	25CJ	BES3	$\psi(2S) \to \gamma\chi_{c1} \to \gamma\eta\eta\eta'$

[1] ABLIKIM 25CJ reports $(1.40 \pm 0.13 \pm 0.09) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to \eta\eta\eta')/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.75 \pm 0.27) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(K_2^*(1430)^+ K^- + \text{c.c.})/\Gamma_{total}$ — Γ_{43}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
1.63±0.27±0.14	351	[1] AAIJ	23AH	LHCB	$B^+ \to K^+ (K_S^0 K\pi)$

[1] AAIJ 23AH reports $(1.61 \pm 0.19 \pm 0.19 \pm 0.14) \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to K_2^*(1430)^+ K^- + \text{c.c.})/\Gamma_{total}] \times [B(\chi_{c1}(1P) \to \overline{K}^0 K^+ \pi^- + \text{c.c.})]$ assuming $B(\chi_{c1}(1P) \to \overline{K}^0 K^+ \pi^- + \text{c.c.}) = (7.0 \pm 0.6) \times 10^{-3}$, which we rescale to our best (shown rounded) value $B(\chi_{c1}(1P) \to \overline{K}^0 K^+ \pi^- + \text{c.c.}) = (6.9 \pm 0.6) \times 10^{-3}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(K_2^*(1430)\overline{K}^0 + \text{c.c.})/\Gamma_{total}$ — Γ_{44}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
1.18±0.17±0.10	278	[1] AAIJ	23AH	LHCB	$B^+ \to K^+ (K_S^0 K\pi)$

[1] AAIJ 23AH reports $(1.17 \pm 0.16 \pm 0.05 \pm 0.10) \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to K_2^*(1430)\overline{K}^0 + \text{c.c.})/\Gamma_{total}] \times [B(\chi_{c1}(1P) \to \overline{K}^0 K^+ \pi^- + \text{c.c.})]$ assuming $B(\chi_{c1}(1P) \to \overline{K}^0 K^+ \pi^- + \text{c.c.}) = (7.0 \pm 0.6) \times 10^{-3}$, which we rescale to our best (shown rounded) value $B(\chi_{c1}(1P) \to \overline{K}^0 K^+ \pi^- + \text{c.c.}) = (6.9 \pm 0.6) \times 10^{-3}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(\pi^0 f_0(980) \to \pi^0 \pi^+ \pi^-)/\Gamma_{total}$ — Γ_{45}/Γ

VALUE (units 10^{-6})	CL%	DOCUMENT ID		TECN	COMMENT
0.35±0.09		ABLIKIM	18D	BES3	$\psi(2S) \to \gamma\pi^0\pi^+\pi^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<6	90	[1] ABLIKIM	11D	BES3	$\psi(2S) \to \gamma\pi^0\pi^+\pi^-$

[1] ABLIKIM 11D reports $[\Gamma(\chi_{c1}(1P) \to \pi^0 f_0(980) \to \pi^0 \pi^+ \pi^-)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma \chi_{c1}(1P))] < 6.0 \times 10^{-7}$ which we divide by our best (shown rounded) value $B(\psi(2S) \to \gamma \chi_{c1}(1P)) = 9.85 \times 10^{-2}$.

$\Gamma(K^+ \overline{K}^*(892)^0 \pi^- + c.c.)/\Gamma_{total}$ — Γ_{46}/Γ

VALUE (units 10^{-4})	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
32 ± 21	[1] TANENBAUM 78	MRK1	$\psi(2S) \to \gamma \chi_{c1}$

[1] Estimated using $B(\psi(2S) \to \gamma \chi_{c1}(1P)) = 0.087$. The errors do not contain the uncertainty in the $\psi(2S)$ decay.

$\Gamma(K^+ \overline{K}^*(892)^0 \pi^- + c.c.)/\Gamma(\pi^+ \pi^- K^+ K^-)$ — Γ_{46}/Γ_9

VALUE	DOCUMENT ID	TECN	COMMENT
0.35 ± 0.18	TANENBAUM 78	MRK1	$\psi(2S) \to \gamma \chi_{c1}$

$\Gamma(K^*(892)^0 \overline{K}^*(892)^0)/\Gamma_{total}$ — Γ_{47}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
$1.42 \pm 0.35 \pm 0.04$	28.4 ± 5.5	[1,2] ABLIKIM 04H	BES	$\psi(2S) \to \gamma K^+ K^- \pi^+ \pi^-$

[1] ABLIKIM 04H reports $[\Gamma(\chi_{c1}(1P) \to K^*(892)^0 \overline{K}^*(892)^0)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma \chi_{c1}(1P))] = (1.40 \pm 0.27 \pm 0.22) \times 10^{-4}$ which we divide by our best (shown rounded) value $B(\psi(2S) \to \gamma \chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

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

$\Gamma(K^+ K^- K^0_S K^0_S)/\Gamma_{total}$ — Γ_{48}/Γ

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$<4 \times 10^{-4}$	90	3.2 ± 2.4	[1] ABLIKIM 05O	BES2	$\psi(2S) \to \chi_{c1} \gamma$

[1] ABLIKIM 05O reports $[\Gamma(\chi_{c1}(1P) \to K^+ K^- K^0_S K^0_S)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma \chi_{c1}(1P))] < 4.2 \times 10^{-5}$ which we divide by our best (shown rounded) value $B(\psi(2S) \to \gamma \chi_{c1}(1P)) = 9.85 \times 10^{-2}$.

$\Gamma(K^0_S K^0_S K^0_S K^0_S)/\Gamma_{total}$ — Γ_{49}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
$0.35 \pm 0.10 \pm 0.01$	22	[1] ABLIKIM 19AA	BES3	$\psi(2S) \to \gamma 4 K^0_S$

[1] Using $B(K^0_S \to \pi^+ \pi^-) = (69.20 \pm 0.05)\%$. ABLIKIM 19AA reports $[\Gamma(\chi_{c1}(1P) \to K^0_S K^0_S K^0_S K^0_S)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma \chi_{c1}(1P))] = (3.4 \pm 0.9 \pm 0.3) \times 10^{-6}$ which we divide by our best (shown rounded) value $B(\psi(2S) \to \gamma \chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value..

$\Gamma(K^+ K^- \phi)/\Gamma_{total}$ — Γ_{51}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
$0.41 \pm 0.15 \pm 0.01$	17	[1] ABLIKIM 06T	BES2	$\psi(2S) \to \gamma 2K^+ 2K^-$

[1] ABLIKIM 06T reports $(0.46 \pm 0.16 \pm 0.06) \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to K^+ K^- \phi)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma \chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma \chi_{c1}(1P)) =$

$(8.7 \pm 0.4) \times 10^{-2}$, which we rescale to our best (shown rounded) value B($\psi(2S) \rightarrow \gamma\chi_{c1}(1P)$) = $(9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(\overline{K}^0 K^+ \pi^- \phi + c.c.)/\Gamma_{total}$ — Γ_{52}/Γ

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
3.27±0.28±0.46	ABLIKIM	15M	BES3	$\psi(2S) \rightarrow \gamma\chi_{c1}$

$\Gamma(K^+ K^- \pi^0 \phi)/\Gamma_{total}$ — Γ_{53}/Γ

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
1.62±0.12±0.28	ABLIKIM	15M	BES3	$\psi(2S) \rightarrow \gamma\chi_{c1}$

$\Gamma(\phi\pi^+\pi^-\pi^0)/\Gamma_{total}$ — Γ_{56}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
0.70±0.09±0.02	373	[1] ABLIKIM	13B	BES3	$e^+e^- \rightarrow \psi(2S) \rightarrow \gamma\chi_{c1}$

[1] ABLIKIM 13B reports $(0.75 \pm 0.06 \pm 0.08) \times 10^{-3}$ from a measurement of [$\Gamma(\chi_{c1}(1P) \rightarrow \phi\pi^+\pi^-\pi^0)/\Gamma_{total}$] × [B($\psi(2S) \rightarrow \gamma\chi_{c1}(1P)$)] assuming B($\psi(2S) \rightarrow \gamma\chi_{c1}(1P)$) = $(9.2 \pm 0.4) \times 10^{-2}$, which we rescale to our best (shown rounded) value B($\psi(2S) \rightarrow \gamma\chi_{c1}(1P)$) = $(9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(\omega\omega)/\Gamma_{total}$ — Γ_{57}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
6.25±0.30 OUR AVERAGE					
6.36±0.27±0.17	11.7k	[1] ABLIKIM	25K	BES3	$\psi(2S) \rightarrow \gamma 2(\pi^+\pi^-\pi^0)$
5.6 ±0.7 ±0.1	597	[2] ABLIKIM	11K	BES3	$\psi(2S) \rightarrow \gamma$ hadrons

[1] ABLIKIM 25K reports $(6.43 \pm 0.07 \pm 0.31) \times 10^{-4}$ from a measurement of [$\Gamma(\chi_{c1}(1P) \rightarrow \omega\omega)/\Gamma_{total}$] × [B($\psi(2S) \rightarrow \gamma\chi_{c1}(1P)$)] assuming B($\psi(2S) \rightarrow \gamma\chi_{c1}(1P)$) = $(9.75 \pm 0.24) \times 10^{-2}$, which we rescale to our best (shown rounded) value B($\psi(2S) \rightarrow \gamma\chi_{c1}(1P)$) = $(9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

[2] ABLIKIM 11K reports $(6.0 \pm 0.3 \pm 0.7) \times 10^{-4}$ from a measurement of [$\Gamma(\chi_{c1}(1P) \rightarrow \omega\omega)/\Gamma_{total}$] × [B($\psi(2S) \rightarrow \gamma\chi_{c1}(1P)$)] assuming B($\psi(2S) \rightarrow \gamma\chi_{c1}(1P)$) = $(9.2 \pm 0.4) \times 10^{-2}$, which we rescale to our best (shown rounded) value B($\psi(2S) \rightarrow \gamma\chi_{c1}(1P)$) = $(9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(\omega K^+ K^-)/\Gamma_{total}$ — Γ_{58}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
0.73±0.08±0.02	628	[1] ABLIKIM	13B	BES3	$e^+e^- \rightarrow \psi(2S) \rightarrow \gamma\chi_{c1}$

[1] ABLIKIM 13B reports $(0.78 \pm 0.04 \pm 0.08) \times 10^{-3}$ from a measurement of [$\Gamma(\chi_{c1}(1P) \rightarrow \omega K^+K^-)/\Gamma_{total}$] × [B($\psi(2S) \rightarrow \gamma\chi_{c1}(1P)$)] assuming B($\psi(2S) \rightarrow \gamma\chi_{c1}(1P)$) = $(9.2 \pm 0.4) \times 10^{-2}$, which we rescale to our best (shown rounded) value B($\psi(2S) \rightarrow \gamma\chi_{c1}(1P)$) = $(9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(\omega\phi)/\Gamma_{total}$ Γ_{59}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
2.13±0.30 OUR AVERAGE	Error includes scale factor of 1.5.				
1.98±0.22±0.05	356	[1] ABLIKIM	25K	BES3	$\psi(2S) \to \gamma\pi^+\pi^-\pi^0 K^+K^-$
2.7 ±0.4 ±0.1	105	[2] ABLIKIM	19J	BES3	$\psi(2S) \to \gamma$ hadrons
• • • We do not use the following data for averages, fits, limits, etc. • • •					
2.1 ±0.6 ±0.1	15	[3,4] ABLIKIM	11K	BES3	$\psi(2S) \to \gamma$ hadrons

[1] ABLIKIM 25K reports $(0.20 \pm 0.02 \pm 0.01) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to \omega\phi)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.75 \pm 0.24) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

[2] ABLIKIM 19J reports $[\Gamma(\chi_{c1}(1P) \to \omega\phi)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))] = (2.67 \pm 0.31 \pm 0.27) \times 10^{-6}$ which we divide by our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

[3] ABLIKIM 11K reports $(0.22 \pm 0.06 \pm 0.02) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to \omega\phi)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.2 \pm 0.4) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

[4] Superseded by ABLIKIM 19J.

$\Gamma(\phi\phi)/\Gamma_{total}$ Γ_{60}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
4.22±0.17±0.11	1529	[1,2] ABLIKIM	23N	BES3	$\psi(2S) \to \gamma$hadrons
• • • We do not use the following data for averages, fits, limits, etc. • • •					
4.1 ±0.5 ±0.1	366	[3] ABLIKIM	11K	BES3	$\psi(2S) \to \gamma$hadrons

[1] Using $B(\phi \to K^+K^-) = (49.2 \pm 0.5) \times 10^{-2}$ from PDG 22.

[2] ABLIKIM 23N reports $(4.26 \pm 0.13 \pm 0.15) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to \phi\phi)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.75 \pm 0.24) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

[3] ABLIKIM 11K reports $(4.4 \pm 0.3 \pm 0.5) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to \phi\phi)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.2 \pm 0.4) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(\phi\phi\eta)/\Gamma_{total}$ Γ_{61}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
2.9±0.5±0.1	83.6	[1] ABLIKIM	20B	BES3	$\psi(2S) \to \gamma\phi\phi\eta$

[1] ABLIKIM 20B reports $(2.96 \pm 0.43 \pm 0.22) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to \phi\phi\eta)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.75 \pm 0.24) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(p\overline{p}\pi^0)/\Gamma_{total}$ Γ_{63}/Γ

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
0.154±0.018 OUR AVERAGE				
0.161±0.019±0.004	[1] ONYISI	10	CLE3	$\psi(2S) \to \gamma p \overline{p} X$
0.110±0.046±0.003	[2] ATHAR	07	CLEO	$\psi(2S) \to \gamma h^+ h^- h^0$

[1] ONYISI 10 reports $(1.75 \pm 0.16 \pm 0.13 \pm 0.11) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to p\overline{p}\pi^0)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.07 \pm 0.11 \pm 0.54) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

[2] ATHAR 07 reports $(1.2 \pm 0.5 \pm 0.1) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to p\overline{p}\pi^0)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.07 \pm 0.11 \pm 0.54) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(p\overline{p}\eta)/\Gamma_{total}$ Γ_{64}/Γ

VALUE (units 10^{-3})	CL%	DOCUMENT ID		TECN	COMMENT
0.144±0.024±0.004		[1] ONYISI	10	CLE3	$\psi(2S) \to \gamma p \overline{p} X$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.15	90	[2] ATHAR	07	CLEO	$\psi(2S) \to \gamma h^+ h^- h^0$

[1] ONYISI 10 reports $(1.56 \pm 0.22 \pm 0.14 \pm 0.10) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to p\overline{p}\eta)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.07 \pm 0.11 \pm 0.54) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

[2] ATHAR 07 reports $< 0.16 \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to p\overline{p}\eta)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.07 \pm 0.11 \pm 0.54) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = 9.85 \times 10^{-2}$.

$\Gamma(p\overline{p}\omega)/\Gamma_{total}$ Γ_{65}/Γ

VALUE (units 10^{-3})	DOCUMENT ID		TECN	COMMENT
0.210±0.030±0.006	[1] ONYISI	10	CLE3	$\psi(2S) \to \gamma p \overline{p} X$

[1] ONYISI 10 reports $(2.28 \pm 0.28 \pm 0.16 \pm 0.14) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to p\overline{p}\omega)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.07 \pm 0.11 \pm 0.54) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(p\overline{p}\pi^+\pi^-)/\Gamma_{total}$ Γ_{66}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
0.50±0.19 OUR EVALUATION		Treating systematic error as correlated.			
0.47±0.18 OUR AVERAGE					
0.43±0.18±0.01	27	[1] BAI	99B	BES	$\psi(2S) \to \gamma\chi_{c1}$
1.22±0.81±0.03	6	[2] TANENBAUM	78	MRK1	$\psi(2S) \to \gamma\chi_{c1}$

[1] BAI 99B reports $(0.49 \pm 0.13 \pm 0.17) \times 10^{-3}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to p\overline{p}\pi^+\pi^-)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (8.7 \pm 0.8) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

[2] TANENBAUM 78 reports $[\Gamma(\chi_{c1}(1P) \to p\overline{p}\pi^+\pi^-)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))] = (1.2 \pm 0.8) \times 10^{-4}$ which we divide by our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(p\overline{p}\pi^0\pi^0)/\Gamma_{total}$ — Γ_{67}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<5 \times 10^{-4}$	90	[1] HE	08B	CLEO	$e^+e^- \to \gamma h^+h^-h^0h^0$

[1] HE 08B reports $< 0.05 \times 10^{-2}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to p\overline{p}\pi^0\pi^0)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.07 \pm 0.11 \pm 0.54) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = 9.85 \times 10^{-2}$.

$\Gamma(p\overline{p}\eta\pi^0)/\Gamma_{total}$ — Γ_{68}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
$1.93 \pm 0.12 \pm 0.05$	1695	[1] ABLIKIM	25L	BES3	$\psi(3686) \to \gamma p\overline{p}\eta\pi^0$

[1] ABLIKIM 25L reports $(1.95 \pm 0.05 \pm 0.12) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to p\overline{p}\eta\pi^0)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.75 \pm 0.27) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(p\overline{p}\eta\eta)/\Gamma_{total}$ — Γ_{69}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
$1.39 \pm 0.37 \pm 0.04$	51	[1] ABLIKIM	25CE	BES3	$\psi(2S) \to \gamma\chi_{c1}$

[1] ABLIKIM 25CE reports $(1.40 \pm 0.33 \pm 0.17) \times 10^{-5}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to p\overline{p}\eta\eta)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.75 \pm 0.27) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(p\overline{p}K^+K^-)/\Gamma_{total}$ — Γ_{70}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
$1.86 \pm 0.11 \pm 0.05$	8721	[1] ABLIKIM	25V	BES3	$\psi(2S) \to \gamma p\overline{p}K^+K^-$

[1] ABLIKIM 25V reports $[\Gamma(\chi_{c1}(1P) \to p\overline{p}K^+K^-)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))] = (1.83 \pm 0.02 \pm 0.11) \times 10^{-5}$ which we divide by our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(p\overline{p}K^+K^-\text{(non-resonant)})/\Gamma_{total}$ — Γ_{71}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
1.26±0.22±0.03	82 ± 9	[1] ABLIKIM	11F	BES3	$\psi(2S) \to \gamma p\overline{p}K^+K^-$

[1] ABLIKIM 11F reports $(1.35\pm0.15\pm0.19)\times10^{-4}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to p\overline{p}K^+K^-\text{(non-resonant)})/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.2 \pm 0.4) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(K^+\overline{p}\Lambda(1520)+\text{c.c.})/\Gamma_{total}$ — Γ_{72}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
1.69±0.43±0.04	48 ± 10	[1] ABLIKIM	11F	BES3	$\psi(2S) \to \gamma p\overline{p}K^+K^-$

[1] ABLIKIM 11F reports $(1.81\pm0.38\pm0.28)\times10^{-4}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to K^+\overline{p}\Lambda(1520)+\text{ c.c.})/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.2 \pm 0.4) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(\Lambda(1520)\overline{\Lambda}(1520))/\Gamma_{total}$ — Γ_{73}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<9 × 10^{-5}	90	[1] ABLIKIM	11F	BES3	$\psi(2S) \to \gamma p\overline{p}K^+K^-$

[1] ABLIKIM 11F reports $< 1.00 \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to \Lambda(1520)\overline{\Lambda}(1520))/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.2 \pm 0.4) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = 9.85 \times 10^{-2}$.

$\Gamma(p\overline{p}\phi)/\Gamma_{total}$ — Γ_{74}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<1.7 × 10^{-5}	90	[1] ABLIKIM	11F	BES3	$\psi(2S) \to \gamma p\overline{p}K^+K^-$

[1] ABLIKIM 11F reports $< 1.82 \times 10^{-5}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to p\overline{p}\phi)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.2 \pm 0.4) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = 9.85 \times 10^{-2}$.

$\Gamma(p\overline{p}K^0_SK^0_S)/\Gamma_{total}$ — Γ_{75}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<4 × 10^{-4}	90	[1] ABLIKIM	06D	BES2	$\psi(2S) \to \gamma\chi_{c1}$

[1] ABLIKIM 06D reports $< 4.5\times10^{-4}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to p\overline{p}K^0_SK^0_S)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c2}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c2}(1P)) = (9.1 \pm 0.6) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c2}(1P)) = 9.63 \times 10^{-2}$.

$\Gamma(p\overline{n}\pi^-)/\Gamma_{total}$ — Γ_{77}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
3.8±0.5±0.1	1412	[1] ABLIKIM	12J	BES3	$\psi(2S) \to \gamma p\overline{n}\pi^-$

[1] ABLIKIM 12J reports $[\Gamma(\chi_{c1}(1P) \to p\overline{n}\pi^-)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))] = (0.37 \pm 0.02 \pm 0.04) \times 10^{-4}$ which we divide by our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(\overline{p}n\pi^+)/\Gamma_{total}$ — Γ_{78}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
3.9±0.5±0.1	1625	[1] ABLIKIM	12J	BES3	$\psi(2S) \to \gamma\overline{p}n\pi^+$

[1] ABLIKIM 12J reports $[\Gamma(\chi_{c1}(1P) \to \overline{p}n\pi^+)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))] = (0.38 \pm 0.02 \pm 0.04) \times 10^{-4}$ which we divide by our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(p\overline{n}\pi^-\pi^0)/\Gamma_{total}$ — Γ_{79}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
10.2±1.1±0.3	1082	[1] ABLIKIM	12J	BES3	$\psi(2S) \to \gamma p\overline{n}\pi^-\pi^0$

[1] ABLIKIM 12J reports $[\Gamma(\chi_{c1}(1P) \to p\overline{n}\pi^-\pi^0)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))] = (1.00 \pm 0.05 \pm 0.10) \times 10^{-4}$ which we divide by our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(\overline{p}n\pi^+\pi^0)/\Gamma_{total}$ — Γ_{80}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
9.9±1.1±0.3	1261	[1] ABLIKIM	12J	BES3	$\psi(2S) \to \gamma\overline{p}n\pi^+\pi^0$

[1] ABLIKIM 12J reports $[\Gamma(\chi_{c1}(1P) \to \overline{p}n\pi^+\pi^0)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))] = (0.98 \pm 0.05 \pm 0.10) \times 10^{-4}$ which we divide by our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(\Lambda\overline{\Lambda}\pi^+\pi^-)/\Gamma_{total}$ — Γ_{82}/Γ

VALUE (units 10^{-5})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
29±5±1		105	[1] ABLIKIM	12I	BES3	$\psi(2S) \to \gamma\Lambda\overline{\Lambda}\pi^+\pi^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<150	90		[2] ABLIKIM	06D	BES2	$\psi(2S) \to \gamma\chi_{c1}$

[1] ABLIKIM 12I reports $(31.1 \pm 3.4 \pm 3.9) \times 10^{-5}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to \Lambda\overline{\Lambda}\pi^+\pi^-)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.2 \pm 0.4) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

[2] Using $B(\psi(2S) \to \chi_{c1}\gamma)$ (9.1 ± 0.6)%.

$\Gamma(\Lambda\overline{\Lambda}\pi^+\pi^-\text{(non-resonant)})/\Gamma_{\text{total}}$ Γ_{83}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
24±6±1	13	[1] ABLIKIM	12I	BES3	$\psi(2S) \to \gamma\Lambda\overline{\Lambda}\pi^+\pi^-$

[1] ABLIKIM 12I reports $(26.2 \pm 5.5 \pm 3.3) \times 10^{-5}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to \Lambda\overline{\Lambda}\pi^+\pi^-\text{(non-resonant)})/\Gamma_{\text{total}}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.2 \pm 0.4) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(\Sigma(1385)^+\overline{\Lambda}\pi^- + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{84}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<1.3 \times 10^{-4}$	90	[1] ABLIKIM	12I	BES3	$\psi(2S) \to \gamma\Sigma(1385)^+\overline{\Lambda}\pi^-$

[1] ABLIKIM 12I reports $< 14 \times 10^{-5}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to \Sigma(1385)^+\overline{\Lambda}\pi^- + \text{c.c.})/\Gamma_{\text{total}}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.2 \pm 0.4) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = 9.85 \times 10^{-2}$.

$\Gamma(\Sigma(1385)^-\overline{\Lambda}\pi^+ + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{85}/Γ

VALUE (units 10^{-5})	CL%	DOCUMENT ID		TECN	COMMENT
<13	90	[1] ABLIKIM	12I	BES3	$\psi(2S) \to \gamma\Sigma(1385)^-\overline{\Lambda}\pi^+$

[1] ABLIKIM 12I reports $< 14 \times 10^{-5}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to \Sigma(1385)^-\overline{\Lambda}\pi^+ + \text{c.c.})/\Gamma_{\text{total}}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.2 \pm 0.4) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = 9.85 \times 10^{-2}$.

$\Gamma(K^+\overline{p}\Lambda\text{+c.c.})/\Gamma_{\text{total}}$ Γ_{90}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
4.1±0.4 OUR AVERAGE	Error includes scale factor of 1.2.				
$9.2^{+2.8}_{-2.4}\pm0.4$	24	[1] LU	19	BELL	$B^+ \to \overline{p}\Lambda K^+ K^+$
4.2±0.4±0.1	3k	[2,3] ABLIKIM	13D	BES3	$\psi(2S) \to \gamma\Lambda\overline{p}K^+$
3.0±0.9±0.1		[4] ATHAR	07	CLEO	$\psi(2S) \to \gamma h^+ h^- h^0$

[1] LU 19 reports $(9.15^{+2.63}_{-2.25} \pm 0.86) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to K^+\overline{p}\Lambda\text{+c.c.})/\Gamma_{\text{total}}] \times [B(B^+ \to \chi_{c1}(1P)K^+)]$ assuming $B(B^+ \to \chi_{c1}(1P)K^+) = (4.79 \pm 0.23) \times 10^{-4}$, which we rescale to our best (shown rounded) value $B(B^+ \to \chi_{c1}(1P)K^+) = (4.74 \pm 0.22) \times 10^{-4}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

[2] ABLIKIM 13D reports $(4.5 \pm 0.2 \pm 0.4) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to K^+\overline{p}\Lambda\text{+c.c.})/\Gamma_{\text{total}}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.2 \pm 0.4) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

[3] Using $B(\Lambda \to p\pi^-) = 63.9\%$.

[4] ATHAR 07 reports $(3.3 \pm 0.9 \pm 0.4) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to K^+\overline{p}\Lambda\text{+c.c.})/\Gamma_{\text{total}}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.07 \pm 0.11 \pm 0.54) \times 10^{-2}$, which we rescale to our best (shown rounded) value

$B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(nK^0_S\overline{\Lambda} + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{91}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
1.64±0.16±0.04	399	[1] ABLIKIM	21AV	BES3	$\psi(2S) \to \gamma nK^0_S\overline{\Lambda}$ + c.c.

[1] ABLIKIM 21AV reports $(1.66 \pm 0.12 \pm 0.12) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to nK^0_S\overline{\Lambda} + \text{c.c.})/\Gamma_{\text{total}}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = 0.0975 \pm 0.0024$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value. Also uses $B(\overline{\Lambda} \to \overline{p}\pi^+) = (63.9 \pm 0.5)\%$ and $B(K^0_S \to \pi^+\pi^-) = (69.20 \pm 0.05)\%$.

$\Gamma(K^*(892)^+\overline{p}\Lambda + \text{c.c.})/\Gamma_{\text{total}}$ Γ_{93}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
4.9±0.6±0.1	328	[1] ABLIKIM	19AU	BES3	$\psi(2S) \to \gamma K^{*+}\overline{p}\Lambda$

[1] ABLIKIM 19AU reports $[\Gamma(\chi_{c1}(1P) \to K^*(892)^+\overline{p}\Lambda + \text{c.c.})/\Gamma_{\text{total}}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))] = (4.8 \pm 0.5 \pm 0.4) \times 10^{-5}$ which we divide by our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(\Sigma^0\overline{\Sigma}^0)/\Gamma_{\text{total}}$ Γ_{94}/Γ

VALUE (units 10^{-5})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
4.2±0.6±0.1		103	[1] ABLIKIM	18V	BES3	$\psi(2S) \to \gamma\Sigma^0\overline{\Sigma}^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<6	90		[2] ABLIKIM	13H	BES3	$\psi(2S) \to \gamma\Sigma^0\overline{\Sigma}^0$
<4	90	3.8 ± 2.5	[3] NAIK	08	CLEO	$\psi(2S) \to \gamma\Sigma^0\overline{\Sigma}^0$

[1] ABLIKIM 18V reports $[\Gamma(\chi_{c1}(1P) \to \Sigma^0\overline{\Sigma}^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))] = (0.41 \pm 0.05 \pm 0.03) \times 10^{-5}$ which we divide by our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

[2] ABLIKIM 13H reports $< 0.62 \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to \Sigma^0\overline{\Sigma}^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.2 \pm 0.4) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = 9.85 \times 10^{-2}$.

[3] NAIK 08 reports $< 0.44 \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to \Sigma^0\overline{\Sigma}^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.07 \pm 0.11 \pm 0.54) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = 9.85 \times 10^{-2}$.

$\Gamma(\Sigma^+\overline{\Sigma}^-)/\Gamma_{\text{total}}$ Γ_{97}/Γ

VALUE (units 10^{-5})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
3.6±0.6±0.1		59	[1] ABLIKIM	18V	BES3	$\psi(2S) \to \gamma\Sigma^+\overline{\Sigma}^-$

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

<8	90		[2] ABLIKIM	13H	BES3	$\psi(2S) \to \gamma \Sigma^+ \overline{\Sigma}^-$
<6	90	4.3 ± 2.3	[3] NAIK	08	CLEO	$\psi(2S) \to \gamma \Sigma^+ \overline{\Sigma}^-$

[1] ABLIKIM 18V reports $[\Gamma(\chi_{c1}(1P) \to \Sigma^+ \overline{\Sigma}^-)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma \chi_{c1}(1P))] = (0.35 \pm 0.06 \pm 0.02) \times 10^{-5}$ which we divide by our best (shown rounded) value $B(\psi(2S) \to \gamma \chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

[2] ABLIKIM 13H reports $< 0.87 \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to \Sigma^+ \overline{\Sigma}^-)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma \chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma \chi_{c1}(1P)) = (9.2 \pm 0.4) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma \chi_{c1}(1P)) = 9.85 \times 10^{-2}$.

[3] NAIK 08 reports $< 0.65 \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to \Sigma^+ \overline{\Sigma}^-)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma \chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma \chi_{c1}(1P)) = (9.07 \pm 0.11 \pm 0.54) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma \chi_{c1}(1P)) = 9.85 \times 10^{-2}$.

$\Gamma(\Sigma^+ \overline{\Sigma}^- \eta)/\Gamma_{total}$ — Γ_{98}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
5.0±1.4±0.1	36	[1] ABLIKIM	24CA	BES3	$\psi(2S) \to \gamma \chi_{c1}(1P)$

[1] ABLIKIM 24CA reports $(5.10 \pm 1.21 \pm 0.67) \times 10^{-5}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to \Sigma^+ \overline{\Sigma}^- \eta)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma \chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma \chi_{c1}(1P)) = (9.75 \pm 0.24) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma \chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(\Sigma^- \overline{\Sigma}^+)/\Gamma_{total}$ — Γ_{99}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
5.6±1.5±0.1	214	[1] ABLIKIM	20I	BES3	$\psi(2S) \to \gamma \Sigma^- \overline{\Sigma}^+$

[1] ABLIKIM 20I reports $(5.7 \pm 1.4 \pm 0.6) \times 10^{-5}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to \Sigma^- \overline{\Sigma}^+)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma \chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma \chi_{c1}(1P)) = (9.75 \pm 0.24) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma \chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(\Sigma(1385)^+ \overline{\Sigma}(1385)^-)/\Gamma_{total}$ — Γ_{100}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<9 × 10⁻⁵	90	[1] ABLIKIM	12I	BES3	$\psi(2S) \to \gamma \Lambda \overline{\Lambda} \pi^+ \pi^-$

[1] ABLIKIM 12I reports $< 10 \times 10^{-5}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to \Sigma(1385)^+ \overline{\Sigma}(1385)^-)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma \chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma \chi_{c1}(1P)) = (9.2 \pm 0.4) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma \chi_{c1}(1P)) = 9.85 \times 10^{-2}$.

$\Gamma(\Sigma(1385)^- \overline{\Sigma}(1385)^+)/\Gamma_{total}$ — Γ_{101}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<5 × 10⁻⁵	90	[1] ABLIKIM	12I	BES3	$\psi(2S) \to \gamma \Lambda \overline{\Lambda} \pi^+ \pi^-$

[1] ABLIKIM 12I reports $<$ 5.7×10^{-5} from a measurement of $[\Gamma(\chi_{c1}(1P) \rightarrow \Sigma(1385)^- \overline{\Sigma}(1385)^+)/\Gamma_{total}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c1}(1P)) = (9.2 \pm 0.4) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \rightarrow \gamma\chi_{c1}(1P)) = 9.85 \times 10^{-2}$.

$\Gamma(K^- \Lambda \overline{\Xi}^+ + \text{c.c.})/\Gamma_{total}$ — Γ_{102}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
1.34±0.24±0.04	49	[1] ABLIKIM	15I	BES3	$\psi(2S) \rightarrow \gamma K^- \Lambda \overline{\Xi}^+ +$ c.c.

[1] ABLIKIM 15I reports $[\Gamma(\chi_{c1}(1P) \rightarrow K^- \Lambda \overline{\Xi}^+ + \text{c.c.})/\Gamma_{total}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c1}(1P))] = (1.32 \pm 0.20 \pm 0.12) \times 10^{-5}$ which we divide by our best (shown rounded) value $B(\psi(2S) \rightarrow \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(\Xi^0 \overline{\Xi}^0)/\Gamma_{total}$ — Γ_{103}/Γ

VALUE (units 10^{-5})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
7.4±1.2±0.2		325	[1] ABLIKIM	22O	BES3	$\psi(2S) \rightarrow \gamma \Xi^0 \overline{\Xi}^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<6	90	1.7 ± 2.4	[2] NAIK	08	CLEO	$\psi(2S) \rightarrow \gamma \Xi^0 \overline{\Xi}^0$

[1] ABLIKIM 22O reports $(0.75 \pm 0.11 \pm 0.06) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \rightarrow \Xi^0 \overline{\Xi}^0)/\Gamma_{total}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c1}(1P)) = (9.75 \pm 0.24) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \rightarrow \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

[2] NAIK 08 reports $< 0.60 \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \rightarrow \Xi^0 \overline{\Xi}^0)/\Gamma_{total}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c1}(1P)) = (9.07 \pm 0.11 \pm 0.54) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \rightarrow \gamma\chi_{c1}(1P)) = 9.85 \times 10^{-2}$.

$\Gamma(\Xi^- \overline{\Xi}^+)/\Gamma_{total}$ — Γ_{104}/Γ

VALUE (units 10^{-4})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
0.59±0.06 OUR AVERAGE						
0.57±0.06±0.02		692	[1] ABLIKIM	22O	BES3	$\psi(2S) \rightarrow \gamma \Xi^- \overline{\Xi}^+$
0.79±0.21±0.02		16.4 ± 4.3	[2] NAIK	08	CLEO	$\psi(2S) \rightarrow \gamma \Xi^+ \overline{\Xi}^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
< 3.4	90		[3] ABLIKIM	06D	BES2	$\psi(2S) \rightarrow \gamma\chi_{c1}$

[1] ABLIKIM 22O reports $(0.58 \pm 0.04 \pm 0.05) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \rightarrow \Xi^- \overline{\Xi}^+)/\Gamma_{total}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c1}(1P)) = (9.75 \pm 0.24) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \rightarrow \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

[2] NAIK 08 reports $(0.86 \pm 0.22 \pm 0.08) \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \rightarrow \Xi^- \overline{\Xi}^+)/\Gamma_{total}] \times [B(\psi(2S) \rightarrow \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \rightarrow \gamma\chi_{c1}(1P)) = (9.07 \pm 0.11 \pm 0.54) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \rightarrow \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

[3] Using $B(\psi(2S) \rightarrow \chi_{c1}\gamma)$ $(9.1 \pm 0.6)\%$.

$\Gamma(\Omega^- \overline{\Omega}^+)/\Gamma_{total}$ — Γ_{105}/Γ

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
1.47±0.25±0.04	277	[1] ABLIKIM	23T	BES3	$\chi_{c1} \to \Omega^- \overline{\Omega}^+$

[1] ABLIKIM 23T reports $(1.49 \pm 0.23 \pm 0.10) \times 10^{-5}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to \Omega^- \overline{\Omega}^+)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma \chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma \chi_{c1}(1P)) = (9.75 \pm 0.24) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma \chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$[\Gamma(\pi^+\pi^-) + \Gamma(K^+K^-)]/\Gamma_{total}$ — Γ_{106}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<1.5 \times 10^{-3}$	90	[1] FELDMAN	77	MRK1	$\psi(2S) \to \gamma \chi_{c1}$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<3.8 \times 10^{-3}$	90	[2] BRANDELIK	79B	DASP	$\psi(2S) \to \gamma \chi_{c1}$

[1] FELDMAN 77 reports $[\left[\Gamma(\chi_{c1}(1P) \to \pi^+\pi^-) + \Gamma(K^+K^-)\right]/\Gamma_{total}] \times [B(\psi(2S) \to \gamma \chi_{c1}(1P))] < 1.5 \times 10^{-4}$ which we divide by our best (shown rounded) value $B(\psi(2S) \to \gamma \chi_{c1}(1P)) = 9.85 \times 10^{-2}$.

[2] Estimated using $B(\psi(2S) \to \gamma \chi_{c1}(1P)) = 0.087$. The errors do not contain the uncertainty in the $\psi(2S)$ decay.

$\Gamma(K^0_S K^0_S)/\Gamma_{total}$ — Γ_{107}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<6 \times 10^{-5}$	90	[1] ABLIKIM	05O	BES2	$\psi(2S) \to \chi_{c1}\gamma$

[1] ABLIKIM 05O reports $[\Gamma(\chi_{c1}(1P) \to K^0_S K^0_S)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma \chi_{c1}(1P))] < 0.6 \times 10^{-5}$ which we divide by our best (shown rounded) value $B(\psi(2S) \to \gamma \chi_{c1}(1P)) = 9.85 \times 10^{-2}$.

$\Gamma(\eta_c \pi^+\pi^-)/\Gamma_{total}$ — Γ_{108}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
$<3.1 \times 10^{-4}$	90	[1,2] ABLIKIM	25BZ	BES3	$e^+e^- \to \psi(2S) \to \gamma \chi_{c1}$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$<3.2 \times 10^{-3}$	90	[3,4] ABLIKIM	13B	BES3	$e^+e^- \to \psi(2S) \to \gamma \chi_{c1}$
$<4.4 \times 10^{-3}$	90	[3,5] ABLIKIM	13B	BES3	$e^+e^- \to \psi(2S) \to \gamma \chi_{c1}$

[1] ABLIKIM 25BZ reports $< 3.1 \times 10^{-4}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to \eta_c \pi^+\pi^-)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma \chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma \chi_{c1}(1P)) = (9.75 \pm 0.27) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma \chi_{c1}(1P)) = 9.85 \times 10^{-2}$.

[2] Using 16 η_c decay channels.

[3] Using 1.06×10^8 $\psi(2S)$ mesons and $B(\psi(2S) \to \chi_{c1}\gamma) = (9.2 \pm 0.4)\%$.

[4] Using the $\eta_c \to K^0_S K^\pm \pi^\mp$ decays.

[5] Using the $\eta_c \to K^+ K^- \pi^0$ decays.

RADIATIVE DECAYS

$\Gamma(\gamma \rho^0)/\Gamma_{total}$ — Γ_{110}/Γ

VALUE (units 10^{-6})	EVTS	DOCUMENT ID		TECN	COMMENT
214±17 OUR AVERAGE					
213±22±6	432 ± 25	[1] ABLIKIM	11E	BES3	$\psi(2S) \to \gamma\gamma\rho^0$

215±24±6	186 ± 15	[2] BENNETT	08A	CLEO	$\psi(2S) \to \gamma\gamma\rho^0$

[1] ABLIKIM 11E reports $(228 \pm 13 \pm 22) \times 10^{-6}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to \gamma\rho^0)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.2 \pm 0.4) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

[2] BENNETT 08A reports $(243 \pm 19 \pm 22) \times 10^{-6}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to \gamma\rho^0)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (8.7 \pm 0.4) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(\gamma\omega)/\Gamma_{total}$ — Γ_{111}/Γ

VALUE (units 10^{-6})	EVTS	DOCUMENT ID		TECN	COMMENT
67± 8 OUR AVERAGE					
65± 9±2	136 ± 14	[1] ABLIKIM	11E	BES3	$\psi(2S) \to \gamma\gamma\omega$
73±17±2	39 ± 7	[2] BENNETT	08A	CLEO	$\psi(2S) \to \gamma\gamma\omega$

[1] ABLIKIM 11E reports $(69.7 \pm 7.2 \pm 6.6) \times 10^{-6}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to \gamma\omega)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.2 \pm 0.4) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

[2] BENNETT 08A reports $(83 \pm 15 \pm 12) \times 10^{-6}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to \gamma\omega)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (8.7 \pm 0.4) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$\Gamma(\gamma\phi)/\Gamma_{total}$ — Γ_{112}/Γ

VALUE (units 10^{-6})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
24±5±1		43 ± 9	[1] ABLIKIM	11E	BES3	$\psi(2S) \to \gamma\gamma\phi$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<23	90	5.2 ± 3.1	[2] BENNETT	08A	CLEO	$\psi(2S) \to \gamma\gamma\phi$

[1] ABLIKIM 11E reports $(25.8 \pm 5.2 \pm 2.3) \times 10^{-6}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to \gamma\phi)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.2 \pm 0.4) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

[2] BENNETT 08A reports $< 26 \times 10^{-6}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to \gamma\phi)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (8.7 \pm 0.4) \times 10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = 9.85 \times 10^{-2}$.

$\Gamma(\gamma\gamma)/\Gamma_{total}$ — Γ_{113}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
< 6 × 10^{-6}	90	[1,2] ABLIKIM	17AE	BES3	$\psi(2S) \to \gamma\chi_{c1} \to 3\gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
< 3.5 × 10^{-5}	90	ECKLUND	08A	CLEO	$\psi(2S) \to \gamma\chi_{c1} \to 3\gamma$
<150 × 10^{-5}	90	[3] YAMADA	77	DASP	$e^+e^- \to 3\gamma$

[1] ABLIKIM 17AE reports $< 6.3\times10^{-6}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to \gamma\gamma)/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.55\pm0.31)\times10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = 9.85 \times 10^{-2}$.

[2] Decay forbidden by the Landau-Yang theorem.

[3] Estimated using $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = 0.087$. The errors do not contain the uncertainty in the $\psi(2S)$ decay.

$\Gamma(e^+e^- J/\psi(1S))/\Gamma_{total}$ — Γ_{114}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$3.62\pm0.23\pm0.10$	1.9k	[1,2] ABLIKIM	17I	BES3	$\psi(2S) \to \gamma e^+e^- J/\psi$

[1] ABLIKIM 17I reports $(3.73\pm0.09\pm0.25)\times10^{-3}$ from a measurement of $[\Gamma(\chi_{c1}(1P) \to e^+e^- J/\psi(1S))/\Gamma_{total}] \times [B(\psi(2S) \to \gamma\chi_{c1}(1P))]$ assuming $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.55\pm0.31)\times10^{-2}$, which we rescale to our best (shown rounded) value $B(\psi(2S) \to \gamma\chi_{c1}(1P)) = (9.85 \pm 0.26) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

[2] Not independent from other measurements reported by ABLIKIM 17I

$\Gamma(e^+e^- J/\psi(1S))/\Gamma(\gamma J/\psi(1S))$ — $\Gamma_{114}/\Gamma_{109}$

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
$10.1\pm0.3\pm0.5$	1.9k	[1] ABLIKIM	17I	BES3	$\psi(2S) \to e^+e^-\gamma J/\psi$

[1] Uses $B(\psi(2S) \to \gamma\chi_{c1}(1P)) \times B(\chi_{c1}(1P) \to \gamma J/\psi(1S)) = (351.8 \pm 1.0 \pm 12.0) \times 10^{-4}$ from ABLIKIM 17N and accounts for common systematic errors.

$\Gamma(\mu^+\mu^- J/\psi(1S))/\Gamma(e^+e^- J/\psi(1S))$ — $\Gamma_{115}/\Gamma_{114}$

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
$6.73\pm0.51\pm0.50$	222	ABLIKIM	19Z	BES3	$\psi(2S) \to \gamma\chi_c \to \gamma(\mu^+\mu^- J/\psi)$

$\chi_{c1}(1P)$ CROSS-PARTICLE BRANCHING RATIOS

$\Gamma(\chi_{c1}(1P) \to 2(\pi^+\pi^-))/\Gamma_{total} \times \Gamma(\psi(2S) \to \gamma\chi_{c1}(1P))/\Gamma_{total}$ — $\Gamma_4/\Gamma \times \Gamma_{197}^{\psi(2S)}/\Gamma^{\psi(2S)}$

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$6.68\pm0.01\pm0.25$	670k	[1,2] ABLIKIM	24BT	BES3	$\psi(2S) \to \gamma\chi_{c1}$

[1] Calculated by us. The value given here is derived from the value of $B(\chi_{c1} \to 2(\pi^+\pi^-))$ reported in ABLIKIM 24BT using $B(\psi(2S) \to \gamma\chi_{c1}) = (9.75 \pm 0.24)\%$ [PDG 22].

[2] Not used since the same experimental measurement has been used in another related quantity elsewhere.

$\Gamma(\chi_{c1}(1P) \to \overline{K}^0 K^+\pi^- + c.c.)/\Gamma_{total} \times \Gamma(\psi(2S) \to \gamma\chi_{c1}(1P))/\Gamma_{total}$ — $\Gamma_{19}/\Gamma \times \Gamma_{197}^{\psi(2S)}/\Gamma^{\psi(2S)}$

VALUE (units 10^{-4})	DOCUMENT ID		TECN	COMMENT
6.8 ± 0.6 OUR FIT Error includes scale factor of 1.1.				
7.2 ± 0.6 OUR AVERAGE				
$7.3\pm0.5\pm0.5$	[1] ATHAR	07	CLEO	$\psi(2S) \to \gamma K_S^0 K^+\pi^-$
$7.0\pm0.5\pm0.9$	[2] ABLIKIM	06R	BES2	$\psi(2S) \to \gamma\chi_{c1}$

[1] Calculated by us. The value of B($\chi_{c1} \rightarrow K^0 K^+ \pi^- +$ c.c.) reported by ATHAR 07 was derived using B($\psi(2S) \rightarrow \gamma \chi_{c1}(1P)$) = (9.07 ± 0.11 ± 0.54)%.

[2] Calculated by us. ABLIKIM 06R reports B($\chi_{c1} \rightarrow K^0_S K^+ \pi^-$) = (4.0 ± 0.3 ± 0.5) × 10^{-3}. We use B($\psi(2S) \rightarrow \gamma \chi_{c1}$) = (8.7 ± 0.4) × 10^{-2}.

$\Gamma(\chi_{c1}(1P) \rightarrow \overline{K}^0 K^+ \pi^- + \text{c.c.})/\Gamma_{total} \times \Gamma(\psi(2S) \rightarrow \gamma \chi_{c1}(1P))/\Gamma(\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-)$ — $\Gamma_{19}/\Gamma \times \Gamma^{\psi(2S)}_{197}/\Gamma^{\psi(2S)}_{12}$

VALUE (units 10^{-4})	DOCUMENT ID	TECN	COMMENT
19.6±1.6 OUR FIT Error includes scale factor of 1.1.			
13.2±2.4±3.2	[1] BAI 99B	BES	$\psi(2S) \rightarrow \gamma K^0_S K^+ \pi^-$

[1] Calculated by us. The value of B($\chi_{c1} \rightarrow K^0_S K^+ \pi^-$) reported by BAI 99B was derived using B($\psi(2S) \rightarrow \gamma \chi_{c1}(1P)$) = (8.7 ± 0.8)% and B($\psi(2S) \rightarrow J/\psi \pi^+ \pi^-$) = (32.4 ± 2.6)% [BAI 98D].

$\Gamma(\chi_{c1}(1P) \rightarrow 2\pi^+ 2\pi^- \eta)/\Gamma_{total} \times \Gamma(\psi(2S) \rightarrow \gamma \chi_{c1}(1P))/\Gamma_{total}$ — $\Gamma_{34}/\Gamma \times \Gamma^{\psi(2S)}_{197}/\Gamma^{\psi(2S)}$

VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT
78.7±0.3±7.4	78k	ABLIKIM 25R	BES3	$e^+ e^- \rightarrow \psi(2S)$

$\Gamma(\chi_{c1}(1P) \rightarrow K^+ K^- K^+ K^-)/\Gamma_{total} \times \Gamma(\psi(2S) \rightarrow \gamma \chi_{c1}(1P))/\Gamma_{total}$ — $\Gamma_{50}/\Gamma \times \Gamma^{\psi(2S)}_{197}/\Gamma^{\psi(2S)}$

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
0.53±0.11 OUR FIT				
0.61±0.11±0.08	54	[1] ABLIKIM 06T	BES2	$\psi(2S) \rightarrow \gamma K^+ K^+ K^- K^-$

[1] Calculated by us. The value of B($\chi_{c1} \rightarrow 2K^+ 2K^-$) reported by ABLIKIM 06T was derived using B($\psi(2S) \rightarrow \gamma \chi_{c1}(1P)$) = (8.7 ± 0.8)%.

$\Gamma(\chi_{c1}(1P) \rightarrow K^+ K^- K^+ K^-)/\Gamma_{total} \times \Gamma(\psi(2S) \rightarrow \gamma \chi_{c1}(1P))/\Gamma(\psi(2S) \rightarrow J/\psi(1S)\pi^+\pi^-)$ — $\Gamma_{50}/\Gamma \times \Gamma^{\psi(2S)}_{197}/\Gamma^{\psi(2S)}_{12}$

VALUE (units 10^{-4})	DOCUMENT ID	TECN	COMMENT
1.51±0.31 OUR FIT			
1.13±0.40±0.29	[1] BAI 99B	BES	$\psi(2S) \rightarrow \gamma K^+ K^+ K^- K^-$

[1] Calculated by us. The value of B($\chi_{c1} \rightarrow 2K^+ 2K^-$) reported by BAI 99B was derived using B($\psi(2S) \rightarrow \gamma \chi_{c1}(1P)$) = (8.7 ± 0.8)% and B($\psi(2S) \rightarrow J/\psi \pi^+ \pi^-$) = (32.4 ± 2.6)% [BAI 98D].

$\Gamma(\chi_{c1}(1P) \rightarrow K^0_S K^0_S K^0_S K^\pm \pi^\mp)/\Gamma_{total} \times \Gamma(\psi(2S) \rightarrow \gamma \chi_{c1}(1P))/\Gamma_{total}$ — $\Gamma_{54}/\Gamma \times \Gamma^{\psi(2S)}_{197}/\Gamma^{\psi(2S)}$

VALUE (units 10^{-6})	EVTS	DOCUMENT ID	TECN	COMMENT
25.6±0.8±1.9	1190	[1] ABLIKIM 25AY	BES3	$\psi(3686) \rightarrow \gamma \chi_{c1}$

[1] ABLIKIM 24AY reports also a measurement B($\chi_{c1}(1P) \rightarrow K^0_S K^0_S K^0_S K^\pm \pi^\mp$) = (26.2 ± 0.8 ± 1.9) × 10^{-5} from this product branching fraction using PDG 24 B($\psi(2S) \rightarrow \gamma \chi_{c1}$) value.

$\Gamma(\chi_{c1}(1P) \to 3(K^+K^-))/\Gamma_{total} \times \Gamma(\psi(2S) \to \gamma\chi_{c1}(1P))/\Gamma_{total}$ $\Gamma_{55}/\Gamma \times \Gamma^{\psi(2S)}_{197}/\Gamma^{\psi(2S)}$

VALUE (units 10^{-7})	EVTS	DOCUMENT ID		TECN	COMMENT
4.1±0.9±0.5	24.9 ± 5.1	[1] ABLIKIM	24P	BES3	$e^+e^- \to \psi(2S)$

[1] Systematic error derived by us, based on the text.

$\Gamma(\chi_{c1}(1P) \to p\overline{p})/\Gamma_{total} \times \Gamma(\psi(2S) \to \gamma\chi_{c1}(1P))/\Gamma_{total}$ $\Gamma_{62}/\Gamma \times \Gamma^{\psi(2S)}_{197}/\Gamma^{\psi(2S)}$

VALUE (units 10^{-6})	EVTS	DOCUMENT ID		TECN	COMMENT
7.85±0.26 OUR FIT Error includes scale factor of 1.6.					
7.93±0.17 OUR AVERAGE					
7.96±0.09±0.15	11279	[1] ABLIKIM	25H	BES3	$\psi(2S) \to \gamma p\overline{p}$
8.2 ±0.7 ±0.4	141 ± 13	[2] NAIK	08	CLEO	$\psi(2S) \to \gamma p\overline{p}$
$4.8\ ^{+1.4}_{-1.3}\ \pm0.6$	$18.2^{+5.5}_{-4.9}$	BAI	04F	BES	$\psi(2S) \to \gamma\chi_{c1}(1P) \to \gamma\overline{p}p$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
7.9 ±0.4 ±0.3	453	[3] ABLIKIM	13V	BES3	$\psi(2S) \to \gamma p\overline{p}$

[1] Calculated by us. ABLIKIM 25H reports $B(\chi_{c1} \to p\overline{p}) = (8.16 \pm 0.09 \pm 0.25) \times 10^{-5}$ using $B(\psi(2S) \to \gamma\chi_{c1}) = (9.75 \pm 0.24)\%$.

[2] Calculated by us. NAIK 08 reports $B(\chi_{c1} \to p\overline{p}) = (9.0 \pm 0.8 \pm 0.4 \pm 0.5) \times 10^{-5}$ using $B(\psi(2S) \to \gamma\chi_{c1}) = (9.07 \pm 0.11 \pm 0.54)\%$.

[3] Superseded by ABLIKIM 25H

$\Gamma(\chi_{c1}(1P) \to p\overline{p})/\Gamma_{total} \times \Gamma(\psi(2S) \to \gamma\chi_{c1}(1P))/\Gamma(\psi(2S) \to J/\psi(1S)\pi^+\pi^-)$ $\Gamma_{62}/\Gamma \times \Gamma^{\psi(2S)}_{197}/\Gamma^{\psi(2S)}_{12}$

VALUE (units 10^{-5})	DOCUMENT ID		TECN	COMMENT
2.26±0.08 OUR FIT Error includes scale factor of 1.5.				
1.1 ±1.0	[1] BAI	98I	BES	$\psi(2S) \to \gamma\chi_{c1} \to \gamma\overline{p}p$

[1] Calculated by us. The value for $B(\chi_{c1} \to p\overline{p})$ reported in BAI 98I is derived using $B(\psi(2S) \to \gamma\chi_{c1}) = (8.7 \pm 0.8)\%$ and $B(\psi(2S) \to J/\psi(1S)\pi^+\pi^-) = (32.4 \pm 2.6)\%$ [BAI 98D].

$\Gamma(\chi_{c1}(1P) \to p\overline{p}K^0_S K^-\pi^+ + \text{c.c.})/\Gamma_{total} \times \Gamma(\psi(2S) \to \gamma\chi_{c1}(1P))/\Gamma_{total}$ $\Gamma_{76}/\Gamma \times \Gamma^{\psi(2S)}_{197}/\Gamma^{\psi(2S)}$

VALUE (units 10^{-6})	EVTS	DOCUMENT ID		TECN	COMMENT
4.05±0.24±0.39	396	ABLIKIM	24BX	BES3	$\psi(2S) \to \gamma\chi_{c1}$

$\Gamma(\chi_{c1}(1P) \to \Lambda\overline{\Lambda})/\Gamma_{total} \times \Gamma(\psi(2S) \to \gamma\chi_{c1}(1P))/\Gamma_{total}$ $\Gamma_{81}/\Gamma \times \Gamma^{\psi(2S)}_{197}/\Gamma^{\psi(2S)}$

VALUE (units 10^{-6})	EVTS	DOCUMENT ID		TECN	COMMENT
12.4±0.9 OUR FIT Error includes scale factor of 1.1.					
12.3±0.9 OUR AVERAGE Error includes scale factor of 1.2.					
12.8±0.6±0.6	528	ABLIKIM	21L	BES3	$\psi(2S) \to \gamma p\pi^-\overline{p}\pi^+$
10.5±1.6±0.6	46	[1] NAIK	08	CLEO	$\psi(2S) \to \gamma\Lambda\overline{\Lambda}$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
11.2±1.0±0.9	136	[2,3] ABLIKIM	13H	BES3	$\psi(2S) \to \gamma\Lambda\overline{\Lambda}$

[1] Calculated by us. NAIK 08 reports B($\chi_{c1} \to \Lambda\overline{\Lambda}$) = (11.6 ± 1.8 ± 0.7 ± 0.7) × 10^{-5} using B($\psi(2S) \to \gamma\chi_{c1}$) = (9.07 ± 0.11 ± 0.54)%.

[2] Superseded by ABLIKIM 21L

[3] Calculated by us. ABLIKIM 13H reports B($\chi_{c1} \to \Lambda\overline{\Lambda}$) = (12.2 ± 1.1 ± 1.1) × 10^{-5} from a measurement of B($\chi_{c1} \to \Lambda\overline{\Lambda}$) × B($\psi(2S) \to \gamma\chi_{c1}$) assuming B($\psi(2S) \to \gamma\chi_{c1}$) = (9.2 ± 0.4)%.

$\Gamma(\chi_{c1}(1P) \to \Lambda\overline{\Lambda})/\Gamma_{total} \times \Gamma(\psi(2S) \to \gamma\chi_{c1}(1P))/\Gamma(\psi(2S) \to J/\psi(1S)\pi^+\pi^-)$ — $\Gamma_{81}/\Gamma \times \Gamma^{\psi(2S)}_{197}/\Gamma^{\psi(2S)}_{12}$

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
3.57±0.25 OUR FIT	Error includes scale factor of 1.1.				
$7.1^{+2.8}_{-2.4}$ ±1.3	$9.0^{+3.5}_{-3.1}$	[1] BAI	03E	BES	$\psi(2S) \to \gamma\Lambda\overline{\Lambda}$

[1] BAI 03E reports [B($\chi_{c1} \to \Lambda\overline{\Lambda}$) B($\psi(2S) \to \gamma\chi_{c1}$) / B($\psi(2S) \to J/\psi\pi^+\pi^-$)] × [$B^2(\Lambda \to \pi^- p)$ / B($J/\psi \to p\overline{p}$)] = ($1.33^{+0.52}_{-0.46}$ ± 0.25)%. We calculate from this measurement the presented value using B($\Lambda \to \pi^- p$) = (63.9 ± 0.5)% and B($J/\psi \to p\overline{p}$) = (2.17 ± 0.07) × 10^{-3}.

$\Gamma(\chi_{c1}(1P) \to \Lambda\overline{\Lambda}\eta)/\Gamma_{total} \times \Gamma(\psi(2S) \to \gamma\chi_{c1}(1P))/\Gamma_{total}$ — $\Gamma_{86}/\Gamma \times \Gamma^{\psi(2S)}_{197}/\Gamma^{\psi(2S)}$

VALUE (units 10^{-6})	EVTS	DOCUMENT ID		TECN	COMMENT
5.72±1.34±0.65	21	ABLIKIM	22AO	BES3	$\psi(2S) \to \gamma p\pi^-\overline{p}\pi^+\gamma\gamma$

$\Gamma(\chi_{c1}(1P) \to \Lambda\overline{\Lambda}\eta')/\Gamma_{total} \times \Gamma(\psi(2S) \to \gamma\chi_{c1}(1P))/\Gamma_{total}$ — $\Gamma_{87}/\Gamma \times \Gamma^{\psi(2S)}_{197}/\Gamma^{\psi(2S)}$

VALUE (units 10^{-6})	DOCUMENT ID		TECN	COMMENT
1.50±0.50±0.15	[1] ABLIKIM	25BX	BES3	$\psi(2S) \to \gamma\chi_{c1}$

[1] Calculated by us. ABLIKIM 25BX reports B($\chi_{c1} \to \Lambda\overline{\Lambda}\eta'$) = (1.54±0.51±0.16)×$10^{-5}$ from a measurement of B($\chi_{c1} \to \Lambda\overline{\Lambda}\eta'$) × B($\psi(2S) \to \gamma\chi_{c1}$) assuming B($\psi(2S) \to \gamma\chi_{c1}$) = (9.75 ± 0.27)%.

$\Gamma(\chi_{c1}(1P) \to \Lambda\overline{\Lambda}\omega)/\Gamma_{total} \times \Gamma(\psi(2S) \to \gamma\chi_{c1}(1P))/\Gamma_{total}$ — $\Gamma_{88}/\Gamma \times \Gamma^{\psi(2S)}_{197}/\Gamma^{\psi(2S)}$

VALUE (units 10^{-6})	EVTS	DOCUMENT ID		TECN	COMMENT
9.8±1.0±1.1	202 ± 20	[1] ABLIKIM	24BE	BES3	$e^+e^- \to \psi(2S) \to \gamma\chi_{c1}$

[1] Calculated by us. The authors report B($\chi_{c1} \to \Lambda\overline{\Lambda}\omega$) obtained from a product using PDG 22 value of B($\psi(2S) \to \gamma\chi_{c1}$).

$\Gamma(\chi_{c1}(1P) \to \Lambda\overline{\Lambda}\phi)/\Gamma_{total} \times \Gamma(\psi(2S) \to \gamma\chi_{c1}(1P))/\Gamma_{total}$ — $\Gamma_{89}/\Gamma \times \Gamma^{\psi(2S)}_{197}/\Gamma^{\psi(2S)}$

VALUE (units 10^{-6})	EVTS	DOCUMENT ID		TECN	COMMENT
5.86±0.87±0.39	51.6	ABLIKIM	24AC	BES3	$\psi(2S) \to \gamma\chi_{c1}$

$\Gamma(\chi_{c1}(1P) \to \overline{p}\Lambda(1520)K^0_S\pi^+ + \text{c.c.})/\Gamma_{total} \times \Gamma(\psi(2S) \to \gamma\chi_{c1}(1P))/\Gamma_{total}$ — $\Gamma_{92}/\Gamma \times \Gamma^{\psi(2S)}_{197}/\Gamma^{\psi(2S)}$

VALUE (units 10^{-6})	EVTS	DOCUMENT ID		TECN	COMMENT
$3.96^{+0.77}_{-0.74}\pm0.50$	88	ABLIKIM	24BX	BES3	$\psi(2S) \to \gamma\chi_{c1}$

$\Gamma(\chi_{c1}(1P) \to \Sigma^+\overline{p}K^0_S + \text{c.c.})/\Gamma_{total} \times \Gamma(\psi(2S) \to \gamma\chi_{c1}(1P))/\Gamma_{total}$ — $\Gamma_{95}/\Gamma \times \Gamma^{\psi(2S)}_{197}/\Gamma^{\psi(2S)}$

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
1.49±0.09±0.07	258	[1] ABLIKIM	19BB	BES3	$\psi(2S) \to \gamma\Sigma^+\overline{p}K^0_S$ + c.c.

[1] Calculated by us. ABLIKIM 19BB reports $B(\chi_{c1} \to \Sigma^+\overline{p}K^0_S + \text{c.c.}) = (1.53 \pm 0.10 \pm 0.08) \times 10^{-4}$ using $B(\psi(2S) \to \gamma\chi_{c1}) = (9.75 \pm 0.24)\%$ and other branching fractions from PDG 18.

$\Gamma(\chi_{c1}(1P) \to \Sigma^0\overline{p}K^+ + \text{c.c.})/\Gamma_{total} \times \Gamma(\psi(2S) \to \gamma\chi_{c1}(1P))/\Gamma_{total}$ — $\Gamma_{96}/\Gamma \times \Gamma^{\psi(2S)}_{197}/\Gamma^{\psi(2S)}$

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
1.42±0.07±0.06	493	[1] ABLIKIM	20AE	BES3	$\psi(2S) \to \gamma\Sigma^0\overline{p}K^+$ + c.c.

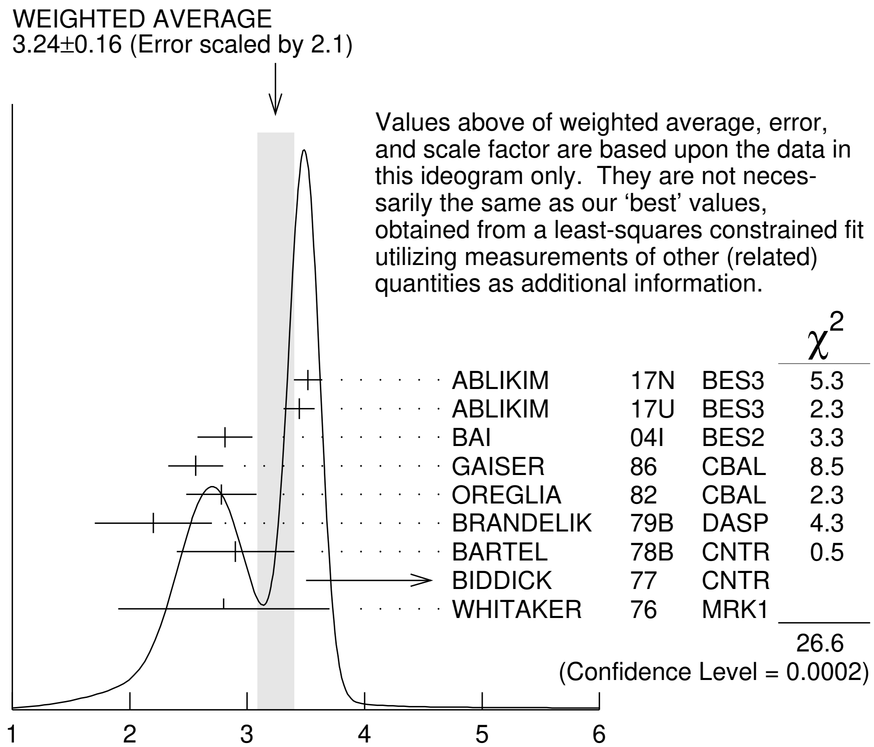
[1] Calculated by us. ABLIKIM 20AE reports $B(\chi_{c1} \to \Sigma^0\overline{p}K^+ + \text{c.c.}) = (1.46 \pm 0.07 \pm 0.07) \times 10^{-4}$ using $B(\psi(2S) \to \gamma\chi^0_c) = (9.75 \pm 0.24)\%$ and other branching fractions from PDG 20.

$\Gamma(\chi_{c1}(1P) \to \gamma J/\psi(1S))/\Gamma_{total} \times \Gamma(\psi(2S) \to \gamma\chi_{c1}(1P))/\Gamma_{total}$ — $\Gamma_{109}/\Gamma \times \Gamma^{\psi(2S)}_{197}/\Gamma^{\psi(2S)}$

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
3.34 ±0.10 OUR FIT	Error includes scale factor of 1.7.				
3.24 ±0.16 OUR AVERAGE	Error includes scale factor of 2.1. See the ideogram below.				
3.518±0.010±0.120	143k	[1] ABLIKIM	17N	BES3	$\psi(2S) \to \gamma\gamma J/\psi$
3.442±0.010±0.132	1.9M	ABLIKIM	17U	BES3	$e^+e^- \to \gamma X$
2.81 ±0.05 ±0.23	13k	BAI	04I	BES2	$\psi(2S) \to J/\psi\gamma\gamma$
2.56 ±0.12 ±0.20		GAISER	86	CBAL	$\psi(2S) \to \gamma X$
2.78 ±0.30		[2] OREGLIA	82	CBAL	$\psi(2S) \to \gamma\chi_{c1}$
2.2 ±0.5		[3] BRANDELIK	79B	DASP	$\psi(2S) \to \gamma\chi_{c1}$
2.9 ±0.5		[3] BARTEL	78B	CNTR	$\psi(2S) \to \gamma\chi_{c1}$
5.0 ±1.5		[4] BIDDICK	77	CNTR	$e^+e^- \to \gamma X$
2.8 ±0.9		[2] WHITAKER	76	MRK1	e^+e^-
• • • We do not use the following data for averages, fits, limits, etc. • • •					
3.377±0.009±0.183	142k	[5] ABLIKIM	12O	BES3	$\psi(2S) \to \gamma\chi_{c1}$
3.56 ±0.03 ±0.12	24.9k	[6] MENDEZ	08	CLEO	$\psi(2S) \to \gamma\chi_{c1}$
3.44 ±0.06 ±0.13	3.7k	[7] ADAM	05A	CLEO	Repl. by MENDEZ 08

[1] Uses $B(J/\psi \to e^+e^-) = (5.971 \pm 0.032)\%$ and $B(J/\psi \to \mu^+\mu^-) = (5.961 \pm 0.033)\%$.
[2] Recalculated by us using $B(J/\psi(1S) \to \ell^+\ell^-) = 0.1181 \pm 0.0020$.
[3] Recalculated by us using $B(J/\psi(1S) \to \mu^+\mu^-) = 0.0588 \pm 0.0010$.
[4] Assumes isotropic gamma distribution.
[5] Superseded by ABLIKIM 17N.

[6] Not independent from other measurements of MENDEZ 08.
[7] Not independent from other values reported by ADAM 05A.



$\Gamma\big(\chi_{c1}(1P) \to \gamma J/\psi(1S)\big)/\Gamma_{\rm total} \times \Gamma\big(\psi(2S) \to \gamma\chi_{c1}(1P)\big)/\Gamma_{\rm total}$ (units 10^{-2})

$\Gamma\big(\chi_{c1}(1P) \to \gamma J/\psi(1S)\big)/\Gamma_{\rm total} \times \Gamma\big(\psi(2S) \to \gamma\chi_{c1}(1P)\big)/\Gamma\big(\psi(2S) \to J/\psi(1S)\pi^+\pi^-\big)$ $\Gamma_{109}/\Gamma \times \Gamma^{\psi(2S)}_{197}/\Gamma^{\psi(2S)}_{12}$

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
9.59±0.29 OUR FIT	Error includes scale factor of 1.7.				
10.15±0.28 OUR AVERAGE					
10.17±0.07±0.27	24.9k	MENDEZ	08	CLEO	$\psi(2S) \to \gamma\chi_{c1}$
12.6 ±0.3 ±3.8	3k	[1] ABLIKIM	04B	BES	$\psi(2S) \to J/\psi X$
8.5 ±2.1		[2] HIMEL	80	MRK2	$\psi(2S) \to \gamma\chi_{c1}$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
10.24±0.17±0.23	3.7k	[3] ADAM	05A	CLEO	Repl. by MENDEZ 08

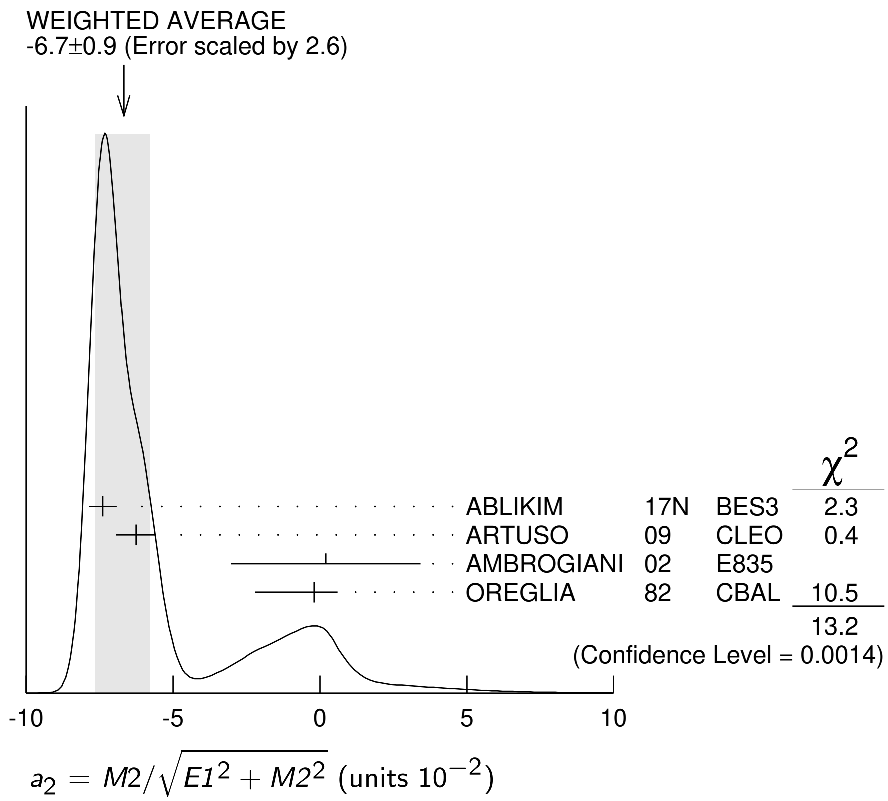
[1] From a fit to the J/ψ recoil mass spectra.
[2] The value for B($\psi(2S) \to \gamma\chi_{c1}$)×B($\chi_{c1} \to \gamma J/\psi(1S)$) quoted in HIMEL 80 is derived using B($\psi(2S) \to J/\psi(1S)\pi^+\pi^-$) = (33 ± 3)% and B($J/\psi(1S) \to \ell^+\ell^-$) = 0.138 ± 0.018. Calculated by us using B($J/\psi(1S) \to \ell^+\ell^-$) = 0.1181 ± 0.0020.
[3] Not independent from other values reported by ADAM 05A.

MULTIPOLE AMPLITUDES IN $\chi_{c1}(1P) \to \gamma J/\psi(1S)$

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

VALUE (units 10^{-2})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
−6.7 ±0.9 OUR AVERAGE		Error includes scale factor of 2.6. See the ideogram below.			
$-7.40\pm0.33\pm0.34$	164k	[1] ABLIKIM	17N	BES3	$\psi(2S) \to \gamma\gamma\ell^+\ell^-$
$-6.26\pm0.63\pm0.24$	39k	ARTUSO	09	CLEO	$\psi(2S) \to \gamma\gamma\ell^+\ell^-$
$0.2\ \pm3.2\ \pm0.4$	2090	AMBROGIANI	02	E835	$p\overline{p} \to \chi_{c1} \to J/\psi\gamma$
$-0.2\ ^{+0.8}_{-2.0}$	921	OREGLIA	82	CBAL	$\psi(2S) \to \chi_{c1}\gamma \to J/\psi\gamma\gamma$

[1] Correlated with b_2 with correlation coefficient $\rho_{a_2 b_2} = 0.133$.



MULTIPOLE AMPLITUDES IN $\psi(2S) \to \gamma\chi_{c1}(1S)$ RADIATIVE DECAY

$b_2 = M2/\sqrt{E1^2 + M2^2}$ Magnetic quadrupole fractional transition amplitude

VALUE (units 10^{-2})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
2.5 ±0.4 OUR AVERAGE					
$2.29\pm0.39\pm0.27$	164k	[1] ABLIKIM	17N	BES3	$\psi(2S) \to \gamma\gamma\ell^+\ell^-$
$2.76\pm0.73\pm0.23$	39k	ARTUSO	09	CLEO	$\psi(2S) \to \gamma\gamma\ell^+\ell^-$
$7.7\ ^{+5.0}_{-4.5}$	921	OREGLIA	82	CBAL	$\psi(2S) \to \gamma\gamma\ell^+\ell^-$

[1] Correlated with a_2 with correlation coefficient $\rho_{a_2 b_2} = 0.133$.

MULTIPOLE AMPLITUDE RATIOS IN RADIATIVE DECAYS $\psi(2S) \to \gamma \chi_{c1}(1S)$ and $\chi_{c1} \to \gamma J/\psi(1S)$

a_2/b_2 Magnetic quadrupole transition amplitude ratio

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
$\mathbf{-2.27^{+0.57}_{-0.99}}$	39k	[1] ARTUSO	09	CLEO	$\psi(2S) \to \gamma\gamma\ell^+\ell^-$

[1] Statistical and systematic errors combined. Not independent of $a_2(\chi_{c1})$ and $b_2(\chi_{c1})$ values from ARTUSO 09.

$\chi_{c1}(1P)$ REFERENCES

ABLIKIM	25AY	PR D112 012007	M. Ablikim et al.	(BESIII Collab.)
ABLIKIM	25BX	PR D112 112015	M. Ablikim et al.	(BESIII Collab.)
ABLIKIM	25BZ	PR D112 112018	M. Ablikim et al.	(BESIII Collab.)
ABLIKIM	25CE	JHEP 2510 090	M. Ablikim et al.	(BESIII Collab.)
ABLIKIM	25CJ	CP C49 123001	M. Ablikim et al.	(BESIII Collab.)
ABLIKIM	25H	PR D111 012003	M. Ablikim et al.	(BESIII Collab.)
ABLIKIM	25I	PR D111 012004	M. Ablikim et al.	(BESIII Collab.)
ABLIKIM	25K	PR D111 032001	M. Ablikim et al.	(BESIII Collab.)
ABLIKIM	25L	PR D111 032008	M. Ablikim et al.	(BESIII Collab.)
ABLIKIM	25R	PR D111 052013	M. Ablikim et al.	(BESIII Collab.)
ABLIKIM	25V	PR D111 072001	M. Ablikim et al.	(BESIII Collab.)
ABLIKIM	24AC	PR D110 032016	M. Ablikim et al.	(BESIII Collab.)
ABLIKIM	24AY	PR D109 L071103	M. Ablikim et al.	(BESIII Collab.)
ABLIKIM	24BE	PR D110 032022	M. Ablikim et al.	(BESIII Collab.)
ABLIKIM	24BT	PR D110 072009	M. Ablikim et al.	(BESIII Collab.)
ABLIKIM	24BW	PR D110 092003	M. Ablikim et al.	(BESIII Collab.)
ABLIKIM	24BX	PR D110 112009	M. Ablikim et al.	(BESIII Collab.)
ABLIKIM	24CA	PR D110 112013	M. Ablikim et al.	(BESIII Collab.)
ABLIKIM	24P	PR D109 072016	M. Ablikim et al.	(BESIII Collab.)
PDG	24	PR D110 030001	S. Navas et al.	(PDG Collab.)
AAIJ	23AH	PR D108 032010	R. Aaij et al.	(LHCb Collab.)
ABLIKIM	23N	JHEP 2305 069	M. Ablikim et al.	(BESIII Collab.)
ABLIKIM	23T	PR D107 092004	M. Ablikim et al.	(BESIII Collab.)
ABLIKIM	22AF	PRL 129 122001	M. Ablikim et al.	(BESIII Collab.)
ABLIKIM	22AO	PR D106 072004	M. Ablikim et al.	(BESIII Collab.)
ABLIKIM	22O	JHEP 2206 074	M. Ablikim et al.	(BESIII Collab.)
ABLIKIM	22Q	PR D106 032014	M. Ablikim et al.	(BESIII Collab.)
PDG	22	PTEP 2022 083C01	R.L. Workman et al.	(PDG Collab.)
ABLIKIM	21AV	JHEP 2111 217	M. Ablikim et al.	(BESIII Collab.)
ABLIKIM	21L	PR D103 112004	M. Ablikim et al.	(BESIII Collab.)
ABLIKIM	20AE	PR D102 092006	M. Ablikim et al.	(BESIII Collab.)
ABLIKIM	20B	PR D101 012012	M. Ablikim et al.	(BESIII Collab.)
ABLIKIM	20I	PR D101 092002	M. Ablikim et al.	(BESIII Collab.)
PDG	20	PTEP 2020 083C01	P.A. Zyla et al.	(PDG Collab.)
ABLIKIM	19AA	PR D99 052008	M. Ablikim et al.	(BESIII Collab.)
ABLIKIM	19AU	PR D100 052010	M. Ablikim et al.	(BESIII Collab.)
ABLIKIM	19BB	PR D100 092006	M. Ablikim et al.	(BESIII Collab.)
ABLIKIM	19J	PR D99 012015	M. Ablikim et al.	(BESIII Collab.)
ABLIKIM	19Z	PR D99 051101	M. Ablikim et al.	(BESIII Collab.)
LU	19	PR D99 032003	P.-C. Lu et al.	(BELLE Collab.)
ABLIKIM	18D	PRL 121 022001	M. Ablikim et al.	(BESIII Collab.)
ABLIKIM	18V	PR D97 052011	M. Ablikim et al.	(BESIII Collab.)
PDG	18	PR D98 030001	M. Tanabashi et al.	(PDG Collab.)
AAIJ	17BB	EPJ C77 609	R. Aaij et al.	(LHCb Collab.)
AAIJ	17BI	PRL 119 221801	R. Aaij et al.	(LHCb Collab.)
ABLIKIM	17AE	PR D96 092007	M. Ablikim et al.	(BESIII Collab.)
ABLIKIM	17I	PRL 118 221802	M. Ablikim et al.	(BESIII Collab.)
ABLIKIM	17K	PR D95 032002	M. Ablikim et al.	(BESIII Collab.)
ABLIKIM	17N	PR D95 072004	M. Ablikim et al.	(BESIII Collab.)
ABLIKIM	17U	PR D96 032001	M. Ablikim et al.	(BESIII Collab.)
PDG	16	CP C40 100001	C. Patrignani et al.	(PDG Collab.)
ABLIKIM	15I	PR D91 092006	M. Ablikim et al.	(BESIII Collab.)
ABLIKIM	15M	PR D91 112008	M. Ablikim et al.	(BESIII Collab.)
ABLIKIM	14J	PR D89 074030	M. Ablikim et al.	(BESIII Collab.)
ABLIKIM	13B	PR D87 012002	M. Ablikim et al.	(BESIII Collab.)

ABLIKIM	13D	PR D87 012007	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	13H	PR D87 032007	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	13V	PR D88 112001	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	12I	PR D86 052004	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	12J	PR D86 052011	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	12O	PRL 109 172002	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	11A	PR D83 012006	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	11D	PR D83 032003	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	11E	PR D83 112005	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	11F	PR D83 112009	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	11K	PRL 107 092001	M. Ablikim *et al.*	(BESIII Collab.)
ONYISI	10	PR D82 011103	P.U.E. Onyisi *et al.*	(CLEO Collab.)
ARTUSO	09	PR D80 112003	M. Artuso *et al.*	(CLEO Collab.)
BENNETT	08A	PRL 101 151801	J.V. Bennett *et al.*	(CLEO Collab.)
ECKLUND	08A	PR D78 091501	K.M. Ecklund *et al.*	(CLEO Collab.)
HE	08B	PR D78 092004	Q. He *et al.*	(CLEO Collab.)
MENDEZ	08	PR D78 011102	H. Mendez *et al.*	(CLEO Collab.)
NAIK	08	PR D78 031101	P. Naik *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	06R	PR D74 072001	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	06T	PL B642 197	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	05G	PR D71 092002	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	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.)
ABLIKIM	04B	PR D70 012003	M. Ablikim *et al.*	(BES Collab.)
ABLIKIM	04H	PR D70 092003	M. Ablikim *et al.*	(BES 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	03E	PR D67 112001	J.Z. Bai *et al.*	(BES Collab.)
AMBROGIANI	02	PR D65 052002	M. Ambrogiani *et al.*	(FNAL E835 Collab.)
BAI	99B	PR D60 072001	J.Z. Bai *et al.*	(BES Collab.)
BAI	98D	PR D58 092006	J.Z. Bai *et al.*	(BES Collab.)
BAI	98I	PRL 81 3091	J.Z. Bai *et al.*	(BES Collab.)
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	86B	PL B172 455	C. Baglin	(LAPP, CERN, GENO, LYON, OSLO+)
GAISER	86	PR D34 711	J. Gaiser *et al.*	(Crystal Ball Collab.)
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)
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+)
FELDMAN	77	PRPL 33C 285	G.J. Feldman, M.L. Perl	(LBL, SLAC)
YAMADA	77	Hamburg Conf. 69	S. Yamada	(DASP Collab.)
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