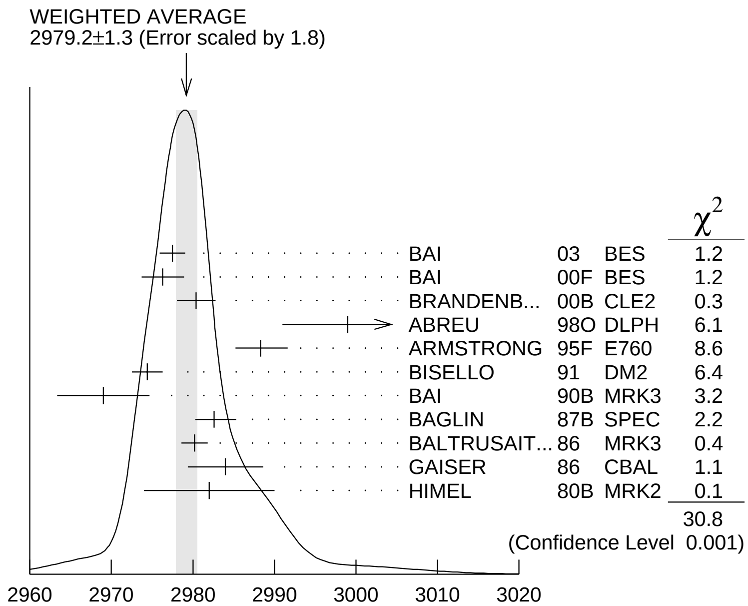
$\eta_c(1S)$

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

$\eta_c(1S)$ MASS

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
2979.2± 1.3 OUR NEW AVERAGE Error includes scale factor of 1.8. See the ideogram below. [2979.7 ± 1.5 MeV OUR 2002 AVERAGE Scale factor = 1.8]					
2977.5± 1.0± 1.2		[1,2] BAI	03	BES	$J/\psi \to \gamma\eta_c$
2976.3± 2.3± 1.2		[1,3,6] BAI	00F	BES	$J/\psi \to \gamma\eta_c$ and $\psi(2S) \to \gamma\eta_c$
2980.4± 2.3± 0.6		BRANDENB...	00B	CLE2	$\gamma\gamma \to \eta_c \to K^\pm K^0_S \pi^\mp$
2999 ± 8	25	ABREU	98O	DLPH	$e^+e^- \to e^+e^-$ +hadrons
$2988.3^{+3.3}_{-3.1}$		ARMSTRONG	95F	E760	$\overline{p}p \to \gamma\gamma$
2974.4± 1.9		[1] BISELLO	91	DM2	$J/\psi \to \eta_c\gamma$
2969 ± 4 ± 4	80	BAI	90B	MRK3	$J/\psi \to \gamma K^+K^-K^+K^-$
$2982.6^{+2.7}_{-2.3}$	12	BAGLIN	87B	SPEC	$\overline{p}p \to \gamma\gamma$
2980.2± 1.6		[1] BALTRUSAIT...	86	MRK3	$J/\psi \to \eta_c\gamma$
2984 ± 2.3± 4.0		GAISER	86	CBAL	$J/\psi \to \gamma X$, $\psi(2S) \to \gamma X$
2982 ± 8	18	[4] HIMEL	80B	MRK2	e^+e^-
• • • We do not use the following data for averages, fits, limits, etc. • • •					
2976.6± 2.9± 1.3	140	[1,3] BAI	00F	BES	$J/\psi \to \gamma\eta_c$
2975.8± 3.9± 1.2		[1,3] BAI	99B	BES	Sup. by BAI 00F
2956 ±12 ±12		BAI	90B	MRK3	$J/\psi \to \gamma K^+K^-K^0_S K^0_L$
2976 ± 8		[5] BALTRUSAIT...	84	MRK3	$J/\psi \to 2\phi\gamma$
2980 ± 9		[4] PARTRIDGE	80B	CBAL	e^+e^-

[1] Average of several decay modes.
[2] From a simultaneous fit of five decay modes of the η_c.
[3] Using an η_c width of 13.2 MeV.
[4] Mass adjusted by us to correspond to $J/\psi(1S)$ mass = 3097 MeV.
[5] $\eta_c \to \phi\phi$.



$\eta_c(1S)$ mass (MeV)

[6] Weighted average of the $\psi(2S)$ and $J/\psi(1S)$ samples.

$\eta_c(1S)$ WIDTH

VALUE (MeV)	*CL%*	*EVTS*	*DOCUMENT ID*	*TECN*	*COMMENT*
$16.1^{+3.1}_{-2.8}$ OUR NEW AVERAGE Error includes scale factor of 1.1. [$16.0^{+3.6}_{-3.2}$ MeV OUR 2002 AVERAGE Scale factor = 1.2]					
$17.0\pm 3.7\pm 7.4$			[7] BAI	03 BES	$J/\psi \to \gamma\eta_c$
$11.0\pm 8.1\pm 4.1$			[9] BAI	00F BES	$J/\psi \to \gamma\eta_c$ and $\psi(2S) \to \gamma\eta_c$
$27.0\pm 5.8\pm 1.4$			BRANDENB...	00B CLE2	$\gamma\gamma \to \eta_c \to K^{\pm}K^0_S\pi^{\mp}$
$23.9^{+12.6}_{-7.1}$			ARMSTRONG	95F E760	$\overline{p}p \to \gamma\gamma$
$7.0^{+7.5}_{-7.0}$		12	BAGLIN	87B SPEC	$\overline{p}p \to \gamma\gamma$
$10.1^{+33.0}_{-8.2}$		23	[8] BALTRUSAIT...	86 MRK3	$J/\psi \to \gamma p\overline{p}$
11.5 ± 4.5			GAISER	86 CBAL	$J/\psi \to \gamma X$, $\psi(2S) \to \gamma X$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<40	90	18	HIMEL	80B MRK2	e^+e^-
<20	90		PARTRIDGE	80B CBAL	e^+e^-

[7] From a simultaneous fit of five decay modes of the η_c.

[8] Positive and negative errors correspond to 90% confidence level.

[9] From a fit to the 4-prong invariant mass in $\psi(2S) \to \gamma\eta_c$ and $J/\psi(1S) \to \gamma\eta_c$ decays.

$\eta_c(1S)$ DECAY MODES

	Mode	Fraction (Γ_i/Γ)	Confidence level
	Decays involving hadronic resonances		
Γ_1	$\eta'(958)\pi\pi$	(4.1 ± 1.7) %	
Γ_2	$\rho\rho$	(2.6 ± 0.9) %	
Γ_3	$K^*(892)^0 K^- \pi^+ +$ c.c.	(2.0 ± 0.7) %	
Γ_4	$K^*(892)\overline{K}^*(892)$	$(8.5 \pm 3.1) \times 10^{-3}$	
Γ_5	$\phi\phi$	$(7.1 \pm 2.8) \times 10^{-3}$	
Γ_6	$a_0(980)\pi$	< 2 %	90%
Γ_7	$a_2(1320)\pi$	< 2 %	90%
Γ_8	$K^*(892)\overline{K} +$ c.c.	< 1.28 %	90%
Γ_9	$f_2(1270)\eta$	< 1.1 %	90%
Γ_{10}	$\omega\omega$	$< 3.1 \times 10^{-3}$	90%
	Decays into stable hadrons		
Γ_{11}	$K\overline{K}\pi$	(5.5 ± 1.7) %	
Γ_{12}	$\eta\pi\pi$	(4.9 ± 1.8) %	
Γ_{13}	$\pi^+\pi^- K^+ K^-$	$(2.0 ^{+0.7}_{-0.6})$ %	
Γ_{14}	$2(K^+ K^-)$	(2.1 ± 1.2) %	
Γ_{15}	$2(\pi^+\pi^-)$	(1.2 ± 0.4) %	
Γ_{16}	$p\overline{p}$	$(1.2 \pm 0.4) \times 10^{-3}$	
Γ_{17}	$K\overline{K}\eta$	< 3.1 %	90%
Γ_{18}	$\pi^+\pi^- p\overline{p}$	< 1.2 %	90%
Γ_{19}	$\Lambda\overline{\Lambda}$	$< 2 \times 10^{-3}$	90%
	Radiative decays		
Γ_{20}	$\gamma\gamma$	$(4.6 \pm 1.6) \times 10^{-4}$	

$\eta_c(1S)$ PARTIAL WIDTHS

$\Gamma(\gamma\gamma)$ Γ_{20}

VALUE (keV)	EVTS	DOCUMENT ID		TECN	COMMENT
7.4± 0.8± 2.1 OUR EVALUATION Treating systematic errors as corrected.					
7.2± 1.2 OUR NEW AVERAGE [7.5 ± 0.8 keV OUR 2002 AVERAGE]					
7.6± 0.8± 2.3		[10] BRANDENB...	00B	CLE2	$\gamma\gamma \to \eta_c \to K^\pm K^0_S \pi^\mp$
6.9± 1.7± 2.1	76	[11] ACCIARRI	99T	L3	$e^+e^- \to e^+e^-\eta_c$
27 ±16 ±10	5	[10] SHIRAI	98	AMY	58 e^+e^-
$6.7^{+2.4}_{-1.7}$± 2.3		[12] ARMSTRONG	95F	E760	$\overline{p}p \to \gamma\gamma$
11.3± 4.2		[13] ALBRECHT	94H	ARG	$e^+e^- \to e^+e^-\eta_c$
$5.9^{+2.1}_{-1.8}$± 1.9		[14] CHEN	90B	CLEO	$e^+e^- \to e^+e^-\eta_c$
$6.4^{+5.0}_{-3.4}$		[15] AIHARA	88D	TPC	$e^+e^- \to e^+e^-X$

$4.3^{+3.4}_{-3.7}\pm 2.4$		[12] BAGLIN	87B	SPEC	$\overline{p}p \to \gamma\gamma$
28 ± 15		[10,16] BERGER	86	PLUT	$\gamma\gamma \to K\overline{K}\pi$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$8.0\pm 2.3\pm 2.4$	17	[17] ADRIANI	93N	L3	$e^+e^- \to e^+e^-\eta_c$

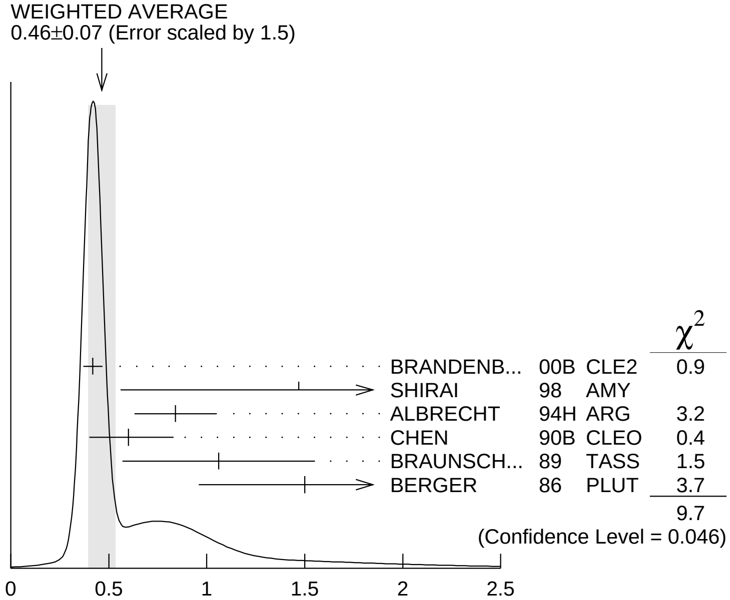
[10] Normalized to $B(\eta_c \to K^\pm K^0_S \pi^\mp)$.
[11] Normalized to the sum of 9 branching ratios.
[12] Normalized to $B(\eta_c \to p\overline{p}) = (1.2 \pm 0.4) \times 10^{-3}$.
[13] Normalized to the sum of $B(\eta_c \to K^\pm K^0_S \pi^\mp)$, $B(\eta_c \to \phi\phi)$, $B(\eta_c \to K^+K^-\pi^+\pi^-)$, and $B(\eta_c \to 2\pi^+2\pi^-)$.
[14] Normalized to the sum of $B(\eta_c \to K^\pm K^0_S \pi^\mp)$, $B(\eta_c \to K^+K^-\pi^+\pi^-)$, and $B(\eta_c \to 2\pi^+2\pi^-)$.
[15] Normalized to the sum of $B(\eta_c \to K^\pm K^0_S \pi^\mp)$, $B(\eta_c \to 2K^+2K^-)$, $B(\eta_c \to K^+K^-\pi^+\pi^-)$, and $B(\eta_c \to 2\pi^+2\pi^-)$.
[16] Re-evaluated by AIHARA 88D.
[17] Superseded by ACCIARRI 99T.

$\eta_c(1S)$ $\Gamma(i)\Gamma(\gamma\gamma)/\Gamma(\text{total})$

$\Gamma(K\overline{K}\pi) \times \Gamma(\gamma\gamma)/\Gamma_{\text{total}}$ — $\Gamma_{11}\Gamma_{20}/\Gamma$

VALUE (keV)	*CL%*	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
0.46 ±0.07 OUR AVERAGE Error includes scale factor of 1.5. See the ideogram below.						
$0.418\pm0.044\pm0.022$			[18] BRANDENB...	00B	CLE2	$\gamma\gamma \to \eta_c \to K^\pm K^0_S \pi^\mp$
$1.47 \pm0.87 \pm0.27$			[18] SHIRAI	98	AMY	$\gamma\gamma \to \eta_c \to K^\pm K^0_S \pi^\mp$
0.84 ± 0.21			[18] ALBRECHT	94H	ARG	$\gamma\gamma \to K^\pm K^0_S \pi^\mp$
$0.60 ^{+0.23}_{-0.20}$			[18] CHEN	90B	CLEO	$\gamma\gamma \to \eta_c K^\pm K^0_S \pi^\mp$
$1.06 \pm0.41 \pm0.27$		11	[18] BRAUNSCH...	89	TASS	$\gamma\gamma \to K\overline{K}\pi$
$1.5 ^{+0.60}_{-0.45} \pm0.3$		7	[18] BERGER	86	PLUT	$\gamma\gamma \to K\overline{K}\pi$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<0.63	95		[18] BEHREND	89	CELL	$\gamma\gamma \to K^0_S K^\pm \pi^\mp$
<4.4	95		ALTHOFF	85B	TASS	$\gamma\gamma \to K\overline{K}\pi$

[18] $K^\pm K^0_S \pi^\mp$ corrected to $K\overline{K}\pi$ by factor 3.



$\Gamma\big(K\overline{K}\pi\big) \times \Gamma\big(\gamma\gamma\big)/\Gamma_{\text{total}}$ $\Gamma_{11}\Gamma_{20}/\Gamma$

$\eta_c(1S)$ BRANCHING RATIOS

HADRONIC DECAYS

$\Gamma\big(\eta'(958)\pi\pi\big)/\Gamma_{\text{total}}$ Γ_1/Γ

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
0.041±0.017	14	[19] BALTRUSAIT...86	MRK3	$J/\psi \to \eta_c\gamma$

$\Gamma\big(\rho\rho\big)/\Gamma_{\text{total}}$ Γ_2/Γ

VALUE (units 10^{-3})	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
26 ± 9 OUR EVALUATION			(Treating systematicerrors as correlated.)		
25 ± 8 OUR AVERAGE					
26.0± 2.4±8.8		113	[19] BISELLO 91	DM2	$J/\psi \to \gamma\rho^0\rho^0$
23.6±10.6±8.2		32	[19] BISELLO 91	DM2	$J/\psi \to \gamma\rho^+\rho^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<140	90		[19] BALTRUSAIT...86	MRK3	$J/\psi \to \eta_c\gamma$

$\Gamma\big(K^*(892)^0K^-\pi^+ + \text{c.c.}\big)/\Gamma_{\text{total}}$ Γ_3/Γ

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
0.02 ±0.007	63	[19] BALTRUSAIT...86	MRK3	$J/\psi \to \eta_c\gamma$

$\Gamma\big(K^*(892)\overline{K}^*(892)\big)/\Gamma_{\text{total}}$ Γ_4/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
85±31 OUR AVERAGE				
82±28±27	14	[19] BISELLO 91	DM2	$e^+e^- \to \gamma K^+K^-\pi^+\pi^-$
90±50	9	[19] BALTRUSAIT...86	MRK3	$J/\psi \to \eta_c\gamma$

$\Gamma(K^*(892)\overline{K}+\text{c.c.})/\Gamma_{\text{total}}$ — Γ_8/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0128	90	BISELLO	91	DM2	$J/\psi \to \gamma K^0_S K^\pm \pi^\mp$
<0.0132	90	[19] BISELLO	91	DM2	$J/\psi \to \gamma K^+ K^- \pi^0$

$\Gamma(\phi\phi)/\Gamma_{\text{total}}$ — Γ_5/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
71±28 OUR EVALUATION (Treating systematic errors as correlated.)					
71±22 OUR AVERAGE					
74±18±24	80	[19] BAI	90B	MRK3	$J/\psi \to \gamma K^+ K^- K^+ K^-$
67±21±24		[19] BAI	90B	MRK3	$J/\psi \to \gamma K^+ K^- K^0_S K^0_L$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
31± 7±10	19	[19] BISELLO	91	DM2	$J/\psi \to \gamma K^+ K^- K^+ K^-$
30^{+18}_{-12}±10	5	[19] BISELLO	91	DM2	$J/\psi \to \gamma K^+ K^- K^0_S K^0_L$

$\Gamma(a_0(980)\pi)/\Gamma_{\text{total}}$ — Γ_6/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.02	90	[19,20] BALTRUSAIT...86	MRK3	$J/\psi \to \eta_c \gamma$

$\Gamma(a_2(1320)\pi)/\Gamma_{\text{total}}$ — Γ_7/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.02	90	[19] BALTRUSAIT...86	MRK3	$J/\psi \to \eta_c \gamma$

$\Gamma(f_2(1270)\eta)/\Gamma_{\text{total}}$ — Γ_9/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.011	90	[19] BALTRUSAIT...86	MRK3	$J/\psi \to \eta_c \gamma$

$\Gamma(\omega\omega)/\Gamma_{\text{total}}$ — Γ_{10}/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.0031	90	[19] BALTRUSAIT...86		MRK3	$J/\psi \to \eta_c \gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.0063		[19] BISELLO	91	DM2	$J/\psi \to \gamma \omega\omega$

$\Gamma(K\overline{K}\pi)/\Gamma_{\text{total}}$ — Γ_{11}/Γ

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
0.055 ±0.017 OUR EVALUATION (Treating systematic errors as correlated.)						
0.055 ±0.008 OUR AVERAGE						
0.0690±0.0142±0.0132		33	[19] BISELLO	91	DM2	$J/\psi \to \gamma K^+ K^- \pi^0$
0.0543±0.0094±0.0094		68	[19] BISELLO	91	DM2	$J/\psi \to \gamma K^\pm \pi^\mp K^0_S$
0.048 ±0.011		95	[19,21] BALTRUSAIT...86		MRK3	$J/\psi \to \eta_c \gamma$
0.161 $^{+0.092}_{-0.073}$			[22] HIMEL	80B	MRK2	$\psi(2S) \to \eta_c \gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<0.107	90		[19] PARTRIDGE	80B	CBAL	$J/\psi \to \eta_c \gamma$

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.049±0.018 OUR EVALUATION					
0.047±0.015 OUR AVERAGE					
0.054±0.020	75	[19] BALTRUSAIT...	86	MRK3	$J/\psi \to \eta_c\gamma$
0.037±0.013±0.020	18	[19] PARTRIDGE	80B	CBAL	$J/\psi \to \eta\pi^+\pi^-\gamma$

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
$0.020^{+0.007}_{-0.006}$ OUR AVERAGE					
0.021±0.007	110	[19] BALTRUSAIT...	86	MRK3	$J/\psi \to \eta_c\gamma$
$0.014^{+0.022}_{-0.009}$		[22] HIMEL	80B	MRK2	$\psi(2S) \to \eta_c\gamma$

$\Gamma(2(\pi^+\pi^-))/\Gamma_{total}$ — Γ_{15}/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.012 ±0.004 OUR EVALUATION					
0.0120±0.0031 OUR AVERAGE					
0.0105±0.0017±0.0034	137	[19] BISELLO	91	DM2	$J/\psi \to \gamma 2\pi^+ 2\pi^-$
0.013 ±0.006	25	[19] BALTRUSAIT...	86	MRK3	$J/\psi \to \eta_c\gamma$
0.020 $^{+0.015}_{-0.010}$		[22] HIMEL	80B	MRK2	$\psi(2S) \to \eta_c\gamma$

$\Gamma(2(K^+K^-))/\Gamma_{total}$ — Γ_{14}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
0.021±0.010±0.006	[23] ALBRECHT	94H	ARG	$\gamma\gamma \to K^+K^-K^+K^-$

$\Gamma(p\overline{p})/\Gamma_{total}$ — Γ_{16}/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
12± 4 OUR AVERAGE					
10± 3±4	18	[19] BISELLO	91	DM2	$J/\psi \to \gamma p\overline{p}$
11± 6	23	[19] BALTRUSAIT...	86	MRK3	$J/\psi \to \eta_c\gamma$
29^{+29}_{-15}		[22] HIMEL	80B	MRK2	$\psi(2S) \to \eta_c\gamma$

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.031	90	[19] BALTRUSAIT...	86	MRK3	$J/\psi \to \eta_c\gamma$

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.012	90	HIMEL	80B	MRK2	$\psi(2S) \to \eta_c\gamma$

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

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.002	90	[19] BISELLO	91	DM2	$e^+e^- \to \gamma\Lambda\overline{\Lambda}$

$\Gamma_i\Gamma_f/\Gamma^2_{total}$ in $p\overline{p} \rightarrow \eta_c(1S) \rightarrow \phi\phi$ — $\Gamma_{16}\Gamma_5/\Gamma^2$

VALUE (units 10^{-5})	DOCUMENT ID		TECN	COMMENT
$4.0^{+3.5}_{-3.2}$	BAGLIN	89	SPEC	$\overline{p}p \rightarrow K^+K^-K^+K^-$

[19] The quoted branching ratios use $B(J/\psi(1S) \rightarrow \gamma\eta_c(1S)) = 0.0127 \pm 0.0036$. Where relevant, the error in this branching ratio is treated as a common systematic in computing averages.
[20] We are assuming $B(a_0(980) \rightarrow \eta\pi) > 0.5$.
[21] Average from $K^+K^-\pi^0$ and $K^\pm K^0{}'s\pi^\mp$ decay channels.
[22] Estimated using $B(\psi(2S) \rightarrow \gamma\eta_c(1S)) = 0.0028 \pm 0.0006$.
[23] Normalized to the sum of $B(\eta_c \rightarrow K^\pm K^0_S\pi^\mp)$, $B(\eta_c \rightarrow \phi\phi)$, $B(\eta_c \rightarrow K^+K^-\pi^+\pi^-)$, and $B(\eta_c \rightarrow 2\pi^+2\pi^-)$.

RADIATIVE DECAYS

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

VALUE (units 10^{-4})	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$2.80^{+0.67}_{-0.58} \pm 1.0$		[24] ARMSTRONG	95F	E760	$\overline{p}p \rightarrow \gamma\gamma$
< 9	90	[19] BISELLO	91	DM2	$J/\psi \rightarrow \gamma\gamma\gamma$
$6\ ^{+4}_{-3} \pm 4$		[24] BAGLIN	87B	SPEC	$\overline{p}p \rightarrow \gamma\gamma$
<18	90	[25] BLOOM	83	CBAL	$J/\psi \rightarrow \eta_c\gamma$

[24] Not independent from the values of the total and two-photon width quoted by the same experiment.
[25] Using $B(J/\psi(1S) \rightarrow \gamma\eta_c(1S)) = 0.0127 \pm 0.0036$.

$\Gamma_i\Gamma_f/\Gamma^2_{total}$ in $p\overline{p} \rightarrow \eta_c(1S) \rightarrow \gamma\gamma$ — $\Gamma_{16}\Gamma_{20}/\Gamma^2$

VALUE (units 10^{-6})	EVTS	DOCUMENT ID		TECN	COMMENT
$0.36\ ^{+0.08}_{-0.07}$ OUR AVERAGE		Error includes scale factor of 1.1.			
$0.336^{+0.080}_{-0.070}$		ARMSTRONG	95F	E760	$\overline{p}p \rightarrow \gamma\gamma$
$0.68\ ^{+0.42}_{-0.31}$	12	BAGLIN	87B	SPEC	$\overline{p}p \rightarrow \gamma\gamma$

$\eta_c(1S)$ REFERENCES

BAI	03	PL B555 174	J.Z. Bai et al.	(BES Collab.)
BAI	00F	PR D62 072001	J.Z. Bai et al.	(BES Collab.)
BRANDENB...	00B	PRL 85 3095	G. Brandenburg et al.	(CLEO Collab.)
ACCIARRI	99T	PL B461 155	M. Acciarri et al.	(L3 Collab.)
BAI	99B	PR D60 072001	J.Z. Bai et al.	(BES Collab.)
ABREU	98O	PL B441 479	P. Abreu et al.	(DELPHI Collab.)
SHIRAI	98	PL B424 405	M. Shirai et al.	(AMY Collab.)
ARMSTRONG	95F	PR D52 4839	T.A. Armstrong et al.	(FNAL, FERR, GENO+)
ALBRECHT	94H	PL B338 390	H. Albrecht et al.	(ARGUS Collab.)
ADRIANI	93N	PL B318 575	O. Adriani et al.	(L3 Collab.)
BISELLO	91	NP B350 1	D. Bisello et al.	(DM2 Collab.)
BAI	90B	PRL 65 1309	Z. Bai et al.	(Mark III Collab.)
CHEN	90B	PL B243 169	W.Y. Chen et al.	(CLEO Collab.)

BAGLIN	89	PL B231 557	C. Baglin, S. Baird, G. Bassompierre	(R704 Collab.)
BEHREND	89	ZPHY C42 367	H.J. Behrend *et al.*	(CELLO Collab.)
BRAUNSCH...	89	ZPHY C41 533	W. Braunschweig *et al.*	(TASSO Collab.)
AIHARA	88D	PRL 60 2355	H. Aihara *et al.*	(TPC Collab.)
BAGLIN	87B	PL B187 191	C. Baglin *et al.*	(R704 Collab.)
BALTRUSAIT...	86	PR D33 629	R.M. Baltrusaitis *et al.*	(Mark III Collab.)
BERGER	86	PL 167B 120	C. Berger *et al.*	(PLUTO Collab.)
GAISER	86	PR D34 711	J. Gaiser *et al.*	(Crystal Ball Collab.)
ALTHOFF	85B	ZPHY C29 189	M. Althoff *et al.*	(TASSO Collab.)
BALTRUSAIT...	84	PRL 52 2126	R.M. Baltrusaitis *et al.*	(CIT, UCSC+) JP
BLOOM	83	ARNS 33 143	E.D. Bloom, C. Peck	(SLAC, CIT)
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