

$h_c(1P)$

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

Quantum numbers are quark model prediction, $C = -$ established by $\eta_c \gamma$ decay.

 $h_c(1P)$ MASS

<u>VALUE (MeV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
3525.38 ± 0.11 OUR AVERAGE				
3525.31 ± 0.11 ± 0.14	832	¹ ABLIKIM	12N BES3	$\psi(2S) \rightarrow \pi^0 \gamma$ hadrons
3525.40 ± 0.13 ± 0.18	3679	ABLIKIM	10B BES3	$\psi(2S) \rightarrow \pi^0 \gamma \eta_c$
3525.20 ± 0.18 ± 0.12	1282	² DOBBS	08A CLEO	$\psi(2S) \rightarrow \pi^0 \eta_c \gamma$
3525.8 ± 0.2 ± 0.2	13	ANDREOTTI	05B E835	$\bar{p} p \rightarrow \eta_c \gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
3525.6 ± 0.5	92 ⁺²³ ₋₂₂	ADAMS	09 CLEO	$\psi(2S) \rightarrow 2(\pi^+ \pi^- \pi^0)$
3524.4 ± 0.6 ± 0.4	168 ± 40	³ ROSNER	05 CLEO	$\psi(2S) \rightarrow \pi^0 \eta_c \gamma$
3527 ± 8	42	ANTONIAZZI	94 E705	300 $\pi^\pm, p\text{Li} \rightarrow J/\psi \pi^0 X$
3526.28 ± 0.18 ± 0.19	59	⁴ ARMSTRONG	92D E760	$\bar{p} p \rightarrow J/\psi \pi^0$
3525.4 ± 0.8 ± 0.4	5	BAGLIN	86 SPEC	$\bar{p} p \rightarrow J/\psi X$

¹ With floating width.

² Combination of exclusive and inclusive analyses for the reaction $\psi(2S) \rightarrow \pi^0 h_c \rightarrow \pi^0 \eta_c \gamma$. This result is the average of DOBBS 08A and ROSNER 05.

³ Superseded by DOBBS 08A.

⁴ Mass central value and systematic error recalculated by us according to Eq. (16) in ARMSTRONG 93B, using the value for the $\psi(2S)$ mass from AULCHENKO 03.

 $h_c(1P)$ WIDTH

<u>VALUE (MeV)</u>	<u>CL%</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.70 ± 0.28 ± 0.22					
• • • We do not use the following data for averages, fits, limits, etc. • • •					
< 1.44	90	3679	² ABLIKIM	10B BES3	$\psi(2S) \rightarrow \pi^0 \gamma \eta_c$
< 1		13	ANDREOTTI	05B E835	$\bar{p} p \rightarrow \eta_c \gamma$
< 1.1	90	59	ARMSTRONG	92D E760	$\bar{p} p \rightarrow J/\psi \pi^0$

¹ With floating mass.

² The central value is $\Gamma = 0.73 \pm 0.45 \pm 0.28$ MeV.

$h_c(1P)$ DECAY MODES

Mode	Fraction (Γ_i/Γ)	Confidence level
Γ_1 $J/\psi(1S)\pi^0$		
Γ_2 $J/\psi(1S)\pi\pi$	not seen	
Γ_3 $J/\psi(1S)\pi^+\pi^-$	$< 2.3 \times 10^{-3}$	90%
Γ_4 $p\bar{p}$	$< 1.5 \times 10^{-4}$	90%
Γ_5 $p\bar{p}\pi^+\pi^-$	$(2.9 \pm 0.6) \times 10^{-3}$	
Γ_6 $p\bar{p}\pi^0\pi^0$	$< 5 \times 10^{-4}$	90%
Γ_7 $\pi^+\pi^-\pi^0$	$(1.6 \pm 0.5) \times 10^{-3}$	
Γ_8 $\pi^+\pi^-\pi^0\eta$	$(7.2 \pm 2.3) \times 10^{-3}$	
Γ_9 $2\pi^+2\pi^-\pi^0$	$(8.1 \pm 1.8) \times 10^{-3}$	
Γ_{10} $3\pi^+3\pi^-\pi^0$	$< 9 \times 10^{-3}$	90%
Γ_{11} $K^+K^-\pi^+\pi^-$	$< 6 \times 10^{-4}$	90%
Γ_{12} $K^+K^-\pi^+\pi^-\pi^0$	$(3.2 \pm 0.8) \times 10^{-3}$	
Γ_{13} $K^+K^-\pi^+\pi^-\eta$	$< 2.3 \times 10^{-3}$	90%
Γ_{14} $K^+K^-\pi^0$	$< 6 \times 10^{-4}$	90%
Γ_{15} $K^+K^-\pi^0\eta$	$< 2.1 \times 10^{-3}$	90%
Γ_{16} $K^+K^-\eta$	$< 9 \times 10^{-4}$	90%
Γ_{17} $2K^+2K^-\pi^0$	$< 2.4 \times 10^{-4}$	90%
Γ_{18} $K_S^0 K^\pm \pi^\mp$	$< 6 \times 10^{-4}$	90%
Γ_{19} $K_S^0 K^\pm \pi^\mp \pi^+ \pi^-$	$(2.8 \pm 1.0) \times 10^{-3}$	
Radiative decays		
Γ_{20} $\gamma\eta$	$(4.7 \pm 2.1) \times 10^{-4}$	
Γ_{21} $\gamma\eta'(958)$	$(1.5 \pm 0.4) \times 10^{-3}$	
Γ_{22} $\gamma\eta_c(1S)$	$(50 \pm 9) \%$	

$h_c(1P)$ PARTIAL WIDTHS

$h_c(1P) \Gamma(i)\Gamma(\bar{p}p)/\Gamma(\text{total})$

$\Gamma(\gamma\eta_c(1S)) \times \Gamma(\bar{p}p)/\Gamma_{\text{total}}$	$\Gamma_{22}\Gamma_4/\Gamma$			
<u>VALUE (eV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
12.0±4.5	13	¹ ANDREOTTI 05B	E835	$\bar{p}p \rightarrow \eta_c\gamma$
¹ Assuming $\Gamma = 1$ MeV.				

$h_c(1P)$ BRANCHING RATIOS

$\Gamma(J/\psi(1S)\pi\pi)/\Gamma(J/\psi(1S)\pi^0)$	Γ_2/Γ_1			
<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<0.18	90	ARMSTRONG 92D	E760	$\bar{p}p \rightarrow J/\psi\pi^0$

$\Gamma(J/\psi(1S)\pi^+\pi^-)/\Gamma_{\text{total}}$

Γ_3/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<2.3 \times 10^{-3}$	90	¹ ABLIKIM	18M BES3	$\psi(2S) \rightarrow \pi^0 \pi^+ \pi^- J/\psi$
¹ ABLIKIM 18M reports $[\Gamma(h_c(1P) \rightarrow J/\psi(1S)\pi^+\pi^-)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \pi^0 h_c(1P))]$ $< 2.0 \times 10^{-6}$ which we divide by our best value $B(\psi(2S) \rightarrow \pi^0 h_c(1P)) = 8.6 \times 10^{-4}$.				

$\Gamma(\rho\bar{\rho})/\Gamma_{\text{total}}$

Γ_4/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<1.5 \times 10^{-4}$	90	¹ ABLIKIM	13V BES3	$\psi(2S) \rightarrow \gamma \rho\bar{\rho}$
¹ ABLIKIM 13V reports $[\Gamma(h_c(1P) \rightarrow \rho\bar{\rho})/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \pi^0 h_c(1P))]$ $< 1.3 \times 10^{-7}$ which we divide by our best value $B(\psi(2S) \rightarrow \pi^0 h_c(1P)) = 8.6 \times 10^{-4}$.				

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

Γ_7/Γ

VALUE (units 10^{-3})	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$1.6 \pm 0.5 \pm 0.2$		101	¹ ABLIKIM	19AG BES3	$\psi(2S) \rightarrow \pi^0 h_c(1P)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<2.2	90		² ADAMS	09 CLEO	$\psi(2S) \rightarrow \pi^0 \gamma \eta_c$
¹ ABLIKIM 19AG reports $[\Gamma(h_c(1P) \rightarrow \pi^+\pi^-\pi^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \pi^0 h_c(1P))]$ $= (1.38 \pm 0.35 \pm 0.17) \times 10^{-6}$ which we divide by our best value $B(\psi(2S) \rightarrow \pi^0 h_c(1P)) = (8.6 \pm 1.3) \times 10^{-4}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.					
² ADAMS 09 reports $[\Gamma(h_c(1P) \rightarrow \pi^+\pi^-\pi^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \pi^0 h_c(1P))]$ $< 0.19 \times 10^{-5}$ which we divide by our best value $B(\psi(2S) \rightarrow \pi^0 h_c(1P)) = 8.6 \times 10^{-4}$.					

$\Gamma(\pi^+\pi^-\pi^0\eta)/\Gamma_{\text{total}}$

Γ_8/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
$7.2 \pm 2.0 \pm 1.0$	35	¹ ABLIKIM	20AH BES3	$\psi(2S) \rightarrow \pi^0 h_c(1P)$
¹ ABLIKIM 20AH reports $[\Gamma(h_c(1P) \rightarrow \pi^+\pi^-\pi^0\eta)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \pi^0 h_c(1P))]$ $= (6.2 \pm 1.6 \pm 0.7) \times 10^{-6}$ which we divide by our best value $B(\psi(2S) \rightarrow \pi^0 h_c(1P)) = (8.6 \pm 1.3) \times 10^{-4}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.				

$\Gamma(2\pi^+2\pi^-\pi^0)/\Gamma_{\text{total}}$

Γ_9/Γ

VALUE (units 10^{-2})	EVTS	DOCUMENT ID	TECN	COMMENT
0.81 ± 0.18 OUR AVERAGE				
$0.74 \pm 0.14 \pm 0.11$	254	¹ ABLIKIM	19AG BES3	$\psi(2S) \rightarrow \pi^0 h_c(1P)$
$2.2 \begin{smallmatrix} +0.8 \\ -0.6 \end{smallmatrix} \pm 0.3$	92	² ADAMS	09 CLEO	$\psi(2S) \rightarrow \pi^0 \gamma \eta_c$
¹ ABLIKIM 19AG reports $[\Gamma(h_c(1P) \rightarrow 2\pi^+2\pi^-\pi^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \pi^0 h_c(1P))]$ $= (6.40 \pm 0.81 \pm 0.87) \times 10^{-6}$ which we divide by our best value $B(\psi(2S) \rightarrow \pi^0 h_c(1P)) = (8.6 \pm 1.3) \times 10^{-4}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.				
² ADAMS 09 reports $[\Gamma(h_c(1P) \rightarrow 2\pi^+2\pi^-\pi^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \pi^0 h_c(1P))]$ $= (1.88 \begin{smallmatrix} +0.48 \\ -0.45 \end{smallmatrix} \pm 0.47) \times 10^{-5}$ which we divide by our best value $B(\psi(2S) \rightarrow \pi^0 h_c(1P)) = (8.6 \pm 1.3) \times 10^{-4}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.				

$\Gamma(3\pi^+3\pi^-\pi^0)/\Gamma_{\text{total}}$ Γ_{10}/Γ

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<9 \times 10^{-3}$	90	¹ ABLIKIM	19AG BES3	$\psi(2S) \rightarrow \pi^0 h_c(1P)$

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

- <0.029 90 ² ADAMS 09 CLEO $\psi(2S) \rightarrow \pi^0 \gamma \eta_c$
¹ ABLIKIM 19AG reports $[\Gamma(h_c(1P) \rightarrow 3\pi^+3\pi^-\pi^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \pi^0 h_c(1P))]$
 $< 7.5 \times 10^{-6}$ which we divide by our best value $B(\psi(2S) \rightarrow \pi^0 h_c(1P)) = 8.6 \times 10^{-4}$.
² ADAMS 09 reports $[\Gamma(h_c(1P) \rightarrow 3\pi^+3\pi^-\pi^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \pi^0 h_c(1P))]$
 $< 2.5 \times 10^{-5}$ which we divide by our best value $B(\psi(2S) \rightarrow \pi^0 h_c(1P)) = 8.6 \times 10^{-4}$.

$\Gamma(p\bar{p}\pi^+\pi^-)/\Gamma_{\text{total}}$ Γ_5/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
$2.9 \pm 0.5 \pm 0.4$	230	¹ ABLIKIM	19AG BES3	$\psi(2S) \rightarrow \pi^0 h_c(1P)$

¹ ABLIKIM 19AG reports $[\Gamma(h_c(1P) \rightarrow p\bar{p}\pi^+\pi^-)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \pi^0 h_c(1P))]$
 $= (2.49 \pm 0.27 \pm 0.28) \times 10^{-6}$ which we divide by our best value $B(\psi(2S) \rightarrow \pi^0 h_c(1P))$
 $= (8.6 \pm 1.3) \times 10^{-4}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(p\bar{p}\pi^0\pi^0)/\Gamma_{\text{total}}$ Γ_6/Γ

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$<5 \times 10^{-4}$	90	12	¹ ABLIKIM	20AH BES3	$\psi(2S) \rightarrow \pi^0 h_c(1P)$

¹ ABLIKIM 20AH reports $[\Gamma(h_c(1P) \rightarrow p\bar{p}\pi^0\pi^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \pi^0 h_c(1P))]$
 $< 4.4 \times 10^{-7}$ which we divide by our best value $B(\psi(2S) \rightarrow \pi^0 h_c(1P)) = 8.6 \times 10^{-4}$.

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

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$<6 \times 10^{-4}$	90	¹ ABLIKIM	19AG BES3	$\psi(2S) \rightarrow \pi^0 h_c(1P)$

¹ ABLIKIM 19AG reports $[\Gamma(h_c(1P) \rightarrow K^+K^-\pi^+\pi^-)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \pi^0 h_c(1P))]$
 $< 0.5 \times 10^{-6}$ which we divide by our best value $B(\psi(2S) \rightarrow \pi^0 h_c(1P)) = 8.6 \times 10^{-4}$.

$\Gamma(K^+K^-\pi^+\pi^-\pi^0)/\Gamma_{\text{total}}$ Γ_{12}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
$3.2 \pm 0.7 \pm 0.5$	80	¹ ABLIKIM	20AH BES3	$\psi(2S) \rightarrow \pi^0 h_c(1P)$

¹ ABLIKIM 20AH reports $[\Gamma(h_c(1P) \rightarrow K^+K^-\pi^+\pi^-\pi^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \pi^0 h_c(1P))]$
 $= (2.8 \pm 0.5 \pm 0.3) \times 10^{-6}$ which we divide by our best value $B(\psi(2S) \rightarrow \pi^0 h_c(1P)) = (8.6 \pm 1.3) \times 10^{-4}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

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

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$<2.3 \times 10^{-3}$	90	24	¹ ABLIKIM	20AH BES3	$\psi(2S) \rightarrow \pi^0 h_c(1P)$

¹ ABLIKIM 20AH reports $[\Gamma(h_c(1P) \rightarrow K^+K^-\pi^+\pi^-\eta)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \pi^0 h_c(1P))]$
 $< 2.0 \times 10^{-6}$ which we divide by our best value $B(\psi(2S) \rightarrow \pi^0 h_c(1P)) = 8.6 \times 10^{-4}$.

$\Gamma(K^+ K^- \pi^0)/\Gamma_{\text{total}}$ Γ_{14}/Γ

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
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$<6 \times 10^{-4}$ 90 20 ¹ ABLIKIM 20AH BES3 $\psi(2S) \rightarrow \pi^0 h_c(1P)$

¹ ABLIKIM 20AH reports $[\Gamma(h_c(1P) \rightarrow K^+ K^- \pi^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \pi^0 h_c(1P))]$
 $< 4.8 \times 10^{-7}$ which we divide by our best value $B(\psi(2S) \rightarrow \pi^0 h_c(1P)) = 8.6 \times 10^{-4}$.

$\Gamma(2K^+ 2K^- \pi^0)/\Gamma_{\text{total}}$ Γ_{17}/Γ

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
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$<2.4 \times 10^{-4}$ 90 11 ¹ ABLIKIM 20AH BES3 $\psi(2S) \rightarrow \pi^0 h_c(1P)$

¹ ABLIKIM 20AH reports $[\Gamma(h_c(1P) \rightarrow 2K^+ 2K^- \pi^0)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \pi^0 h_c(1P))]$
 $< 2.1 \times 10^{-7}$ which we divide by our best value $B(\psi(2S) \rightarrow \pi^0 h_c(1P)) = 8.6 \times 10^{-4}$.

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

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
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$<2.1 \times 10^{-3}$ 90 20 ¹ ABLIKIM 20AH BES3 $\psi(2S) \rightarrow \pi^0 h_c(1P)$

¹ ABLIKIM 20AH reports $[\Gamma(h_c(1P) \rightarrow K^+ K^- \pi^0 \eta)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \pi^0 h_c(1P))]$
 $< 1.8 \times 10^{-6}$ which we divide by our best value $B(\psi(2S) \rightarrow \pi^0 h_c(1P)) = 8.6 \times 10^{-4}$.

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

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
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$<9 \times 10^{-4}$ 90 18 ¹ ABLIKIM 20AH BES3 $\psi(2S) \rightarrow \pi^0 h_c(1P)$

¹ ABLIKIM 20AH reports $[\Gamma(h_c(1P) \rightarrow K^+ K^- \eta)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \pi^0 h_c(1P))]$
 $< 7.5 \times 10^{-7}$ which we divide by our best value $B(\psi(2S) \rightarrow \pi^0 h_c(1P)) = 8.6 \times 10^{-4}$.

$\Gamma(K_S^0 K^\pm \pi^\mp)/\Gamma_{\text{total}}$ Γ_{18}/Γ

VALUE	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
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$<6 \times 10^{-4}$ 90 17 ¹ ABLIKIM 20AH BES3 $\psi(2S) \rightarrow \pi^0 h_c(1P)$

¹ ABLIKIM 20AH reports $[\Gamma(h_c(1P) \rightarrow K_S^0 K^\pm \pi^\mp)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \pi^0 h_c(1P))]$
 $< 4.8 \times 10^{-7}$ which we divide by our best value $B(\psi(2S) \rightarrow \pi^0 h_c(1P)) = 8.6 \times 10^{-4}$.

$\Gamma(K_S^0 K^\pm \pi^\mp \pi^+ \pi^-)/\Gamma_{\text{total}}$ Γ_{19}/Γ

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
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$2.8 \pm 0.9 \pm 0.4$ 41 ¹ ABLIKIM 20AH BES3 $\psi(2S) \rightarrow \pi^0 h_c(1P)$

¹ ABLIKIM 20AH reports $[\Gamma(h_c(1P) \rightarrow K_S^0 K^\pm \pi^\mp \pi^+ \pi^-)/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \pi^0 h_c(1P))]$
 $= (2.4 \pm 0.7 \pm 0.3) \times 10^{-6}$ which we divide by our best value $B(\psi(2S) \rightarrow \pi^0 h_c(1P)) = (8.6 \pm 1.3) \times 10^{-4}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

————— RADIATIVE DECAYS —————

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

VALUE (units 10^{-4})	EVTS	DOCUMENT ID	TECN	COMMENT
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$4.7 \pm 1.5 \pm 1.4$ 18 ABLIKIM 16i BES3 $\psi(2S) \rightarrow \pi^0 \gamma \eta$

$\Gamma(\gamma\eta'(958))/\Gamma_{\text{total}}$					Γ_{21}/Γ
VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT	
1.52 ± 0.27 ± 0.29	44	ABLIKIM 16i	BES3	$\psi(2S) \rightarrow \pi^0 \gamma \eta'(958)$	

$\Gamma(\gamma\eta_c(1S))/\Gamma_{\text{total}}$					Γ_{22}/Γ
VALUE (units 10^{-2})	EVTS	DOCUMENT ID	TECN	COMMENT	
50 ± 9 OUR AVERAGE					
53 ± 7 ± 8	3679	¹ ABLIKIM	10B BES3	$\psi(2S) \rightarrow \pi^0 \eta_c \gamma$	
48 ± 6 ± 7		² DOBBS	08A CLEO	$\psi(2S) \rightarrow \pi^0 \eta_c \gamma$	
48 ± 6 ± 7	1282	³ DOBBS	08A CLEO	$\psi(2S) \rightarrow \pi^0 \eta_c \gamma$	
46 ± 12 ± 7	168	⁴ ROSNER	05 CLEO	$\psi(2S) \rightarrow \pi^0 \eta_c \gamma$	

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

¹ ABLIKIM 10B reports $[\Gamma(h_c(1P) \rightarrow \gamma\eta_c(1S))/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \pi^0 h_c(1P))] = (4.58 \pm 0.40 \pm 0.50) \times 10^{-4}$ which we divide by our best value $B(\psi(2S) \rightarrow \pi^0 h_c(1P)) = (8.6 \pm 1.3) \times 10^{-4}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

² Average of DOBBS 08A and ROSNER 05. DOBBS 08A reports $[\Gamma(h_c(1P) \rightarrow \gamma\eta_c(1S))/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \pi^0 h_c(1P))] = (4.16 \pm 0.30 \pm 0.37) \times 10^{-4}$ which we divide by our best value $B(\psi(2S) \rightarrow \pi^0 h_c(1P)) = (8.6 \pm 1.3) \times 10^{-4}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

³ DOBBS 08A reports $[\Gamma(h_c(1P) \rightarrow \gamma\eta_c(1S))/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \pi^0 h_c(1P))] = (4.19 \pm 0.32 \pm 0.45) \times 10^{-4}$ which we divide by our best value $B(\psi(2S) \rightarrow \pi^0 h_c(1P)) = (8.6 \pm 1.3) \times 10^{-4}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

⁴ ROSNER 05 reports $[\Gamma(h_c(1P) \rightarrow \gamma\eta_c(1S))/\Gamma_{\text{total}}] \times [B(\psi(2S) \rightarrow \pi^0 h_c(1P))] = (4.0 \pm 0.8 \pm 0.7) \times 10^{-4}$ which we divide by our best value $B(\psi(2S) \rightarrow \pi^0 h_c(1P)) = (8.6 \pm 1.3) \times 10^{-4}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$h_c(1P)$ REFERENCES

ABLIKIM 20AH	PR D102 112007	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM 19AG	PR D99 072008	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM 18M	PR D97 052008	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM 16i	PRL 116 251802	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM 13V	PR D88 112001	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM 12N	PR D86 092009	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ABLIKIM 10B	PRL 104 132002	M. Ablikim <i>et al.</i>	(BESIII Collab.)
ADAMS 09	PR D80 051106	G.S. Adams <i>et al.</i>	(CLEO Collab.)
DOBBS 08A	PRL 101 182003	S. Dobbs <i>et al.</i>	(CLEO Collab.)
ANDREOTTI 05B	PR D72 032001	M. Andreotti <i>et al.</i>	(FNAL E835 Collab.)
ROSNER 05	PRL 95 102003	J.L. Rosner <i>et al.</i>	(CLEO Collab.)
AULCHENKO 03	PL B573 63	V.M. Aulchenko <i>et al.</i>	(KEDR Collab.)
ANTONIAZZI 94	PR D50 4258	L. Antoniazzi <i>et al.</i>	(E705 Collab.)
ARMSTRONG 93B	PR D47 772	T.A. Armstrong <i>et al.</i>	(FNAL E760 Collab.)
ARMSTRONG 92D	PRL 69 2337	T.A. Armstrong <i>et al.</i>	(FNAL, FERR, GENO+)
BAGLIN 86	PL B171 135	C. Baglin <i>et al.</i>	(LAPP, CERN, TORI, STRB+)