

$$D_{s0}^*(2317)^\pm$$

$$I(J^P) = 0(0^+)^\pm$$

J, P need confirmation.

AUBERT 06P and CHOI 15A do not observe neutral and doubly charged partners of the $D_{s0}^*(2317)^\pm$. See the review on "Heavy Non- $q\bar{q}$ Mesons."

$D_{s0}^*(2317)^\pm$ MASS

The fit includes $D^\pm, D^0, D_s^\pm, D^{*\pm}, D^{*0}, D_s^{*\pm}, D_1(2420)^0, D_2^*(2460)^0$, and $D_{s1}(2536)^\pm$ mass and mass difference measurements.

VALUE (MeV)	EVTs	DOCUMENT ID	TECN	COMMENT
2317.8±0.5 OUR FIT				
2318.0±0.7 OUR AVERAGE				
2318.3±1.2±1.2	115	¹ ABLIKIM	18J BES3	4.6 $e^+e^- \rightarrow D_s^{*\pm} D_{s0}^*(2317)^\mp$
2319.6±0.2±1.4	3.1k	AUBERT	06P BABR	10.6 $e^+e^- \rightarrow D_s^+ \pi^0 X$
2317.3±0.4±0.8	1.0k	² AUBERT	04E BABR	10.6 e^+e^-
• • • We do not use the following data for averages, fits, limits, etc. • • •				
2317.2±1.3	88	³ AUBERT,B	04S BABR	$B \rightarrow D_{s0}^{(*)}(2317)^+ \bar{D}^{(*)}$
2317.2±0.5±0.9	761	⁴ MIKAMI	04 BELL	10.6 e^+e^-
2316.8±0.4±3.0	1.2k	^{4,5} AUBERT	03G BABR	10.6 e^+e^-
2317.6±1.3	273	^{4,6} AUBERT	03G BABR	10.6 e^+e^-
2319.8±2.1±2.0	24	⁴ KROKOVNY	03B BELL	10.6 e^+e^-

¹ From a fit of the D_s^* recoil mass where the $D_{s0}^*(2317)$ signal is described with a Crystal Ball function convolved with a Gaussian function.

² Supersedes AUBERT 03G.

³ Systematic errors not evaluated.

⁴ Not independent of the corresponding $m_{D_{s0}^*(2317)} - m_{D_s}$.

⁵ From $D_s^+ \rightarrow K^+ K^- \pi^+$ decay.

⁶ From $D_s^+ \rightarrow K^+ K^- \pi^+ \pi^0$ decay.

$m_{D_{s0}^*(2317)^\pm} - m_{D_s^\pm}$

The fit includes $D^\pm, D^0, D_s^\pm, D^{*\pm}, D^{*0}, D_s^{*\pm}, D_1(2420)^0, D_2^*(2460)^0$, and $D_{s1}(2536)^\pm$ mass and mass difference measurements.

VALUE (MeV)	EVTs	DOCUMENT ID	TECN	COMMENT
349.4±0.5 OUR FIT				
349.2±0.7 OUR AVERAGE				
348.7±0.5±0.7	761	MIKAMI	04 BELL	10.6 e^+e^-
350.0±1.2±1.0	135	BESSION	03 CLE2	10.6 e^+e^-
351.3±2.1±1.9	24	⁷ KROKOVNY	03B BELL	10.6 e^+e^-
• • • We do not use the following data for averages, fits, limits, etc. • • •				
349.6±0.4±3.0	1267	^{8,9} AUBERT	03G BABR	10.6 e^+e^-
350.2±1.3	273	^{10,11} AUBERT	03G BABR	10.6 e^+e^-

⁷ Recalculated by us using $m_{D_s^+} = 1968.5 \pm 0.6$ MeV.
⁸ From $D_s^+ \rightarrow K^+ K^- \pi^+$ decay.
⁹ Recalculated by us using $m_{D_s^+} = 1967.20 \pm 0.03$ MeV.
¹⁰ From $D_s^+ \rightarrow K^+ K^- \pi^+ \pi^0$ decay.
¹¹ Recalculated by us using $m_{D_s^+} = 1967.4 \pm 0.2$ MeV. Systematic errors not estimated.

$D_{s0}^*(2317)^\pm$ WIDTH

VALUE (MeV)	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
< 3.8	95	3180	AUBERT	06P BABR	$10.6\ e^+e^- \rightarrow D_s^+\pi^0 X$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
< 4.6	90	761	MIKAMI	04 BELL	$10.6\ e^+e^-$
< 10			AUBERT	03G BABR	$10.6\ e^+e^-$
< 7	90	135	BESSION	03 CLE2	$10.6\ e^+e^-$

$D_{s0}^*(2317)^\pm$ DECAY MODES

$D_{s0}^*(2317)^-$ modes are charge conjugates of modes below.

Mode	Fraction (Γ_i/Γ)	Confidence level
$\Gamma_1\ D_s^+\pi^0$	$(100^{+0}_{-20})\%$	
$\Gamma_2\ D_s^+\gamma$	< 5 %	90%
$\Gamma_3\ D_s^*(2112)^+\gamma$	< 6 %	90%
$\Gamma_4\ D_s^+\gamma\gamma$	< 18 %	95%
$\Gamma_5\ D_s^*(2112)^+\pi^0$	< 11 %	90%
$\Gamma_6\ D_s^+\pi^+\pi^-$	< 4 $\times 10^{-3}$	90%
$\Gamma_7\ D_s^+\pi^0\pi^0$	not seen	

$D_{s0}^*(2317)^\pm$ BRANCHING RATIOS

$\Gamma(D_s^+\pi^0)/\Gamma_{\text{total}}$					Γ_1/Γ
VALUE	EVTS	DOCUMENT ID	TECN	COMMENT	
$1.00^{+0.00+0.00}_{-0.14-0.14}$	47	ABLIKIM	18J BES3	$4.6\ e^+e^- \rightarrow D_s^{*\pm} D_{s0}^*(2317)^\mp$	
• • • We do not use the following data for averages, fits, limits, etc. • • •					
seen	1.5k	AUBERT	03G BABR	$10.6\ e^+e^-$	

$\Gamma(D_s^+ \gamma)/\Gamma(D_s^+ \pi^0)$ Γ_2/Γ_1

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.05	90	MIKAMI 04	BELL	10.6 $e^+ e^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<0.14	95	AUBERT 06P	BABR	10.6 $e^+ e^-$
<0.052	90	BESSION 03	CLE2	10.6 $e^+ e^-$

 $\Gamma(D_s^{*}(2112)^+ \gamma)/\Gamma(D_s^+ \pi^0)$ Γ_3/Γ_1

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.059	90	BESSION 03	CLE2	10.6 $e^+ e^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<0.16	95	AUBERT 06P	BABR	10.6 $e^+ e^-$
<0.18	90	MIKAMI 04	BELL	10.6 $e^+ e^-$

 $\Gamma(D_s^+ \gamma \gamma)/\Gamma(D_s^+ \pi^0)$ Γ_4/Γ_1

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.18	95	AUBERT 06P	BABR	10.6 $e^+ e^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
not seen		AUBERT 03G	BABR	10.6 $e^+ e^-$

 $\Gamma(D_s^{*}(2112)^+ \pi^0)/\Gamma(D_s^+ \pi^0)$ Γ_5/Γ_1

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.11	90	BESSION 03	CLE2	10.6 $e^+ e^-$

 $\Gamma(D_s^+ \pi^+ \pi^-)/\Gamma(D_s^+ \pi^0)$ Γ_6/Γ_1

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.004	90	MIKAMI 04	BELL	10.6 $e^+ e^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<0.005	95	AUBERT 06P	BABR	10.6 $e^+ e^-$
<0.019	90	BESSION 03	CLE2	10.6 $e^+ e^-$

 $\Gamma(D_s^+ \pi^0 \pi^0)/\Gamma(D_s^+ \pi^0)$ Γ_7/Γ_1

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<0.25	95	AUBERT 06P	BABR	10.6 $e^+ e^-$

$D_{s0}^{*}(2317)^{\pm}$ REFERENCES

ABLIKIM 18J	PR D97 051103	M. Ablikim <i>et al.</i>	(BESIII Collab.)
CHOI 15A	PR D91 092011	S.-K. Choi <i>et al.</i>	(BELLE Collab.)
AUBERT 06P	PR D74 032007	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT 04E	PR D69 031101	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT,B 04S	PRL 93 181801	B. Aubert <i>et al.</i>	(BABAR Collab.)
MIKAMI 04	PRL 92 012002	Y. Mikami <i>et al.</i>	(BELLE Collab.)
AUBERT 03G	PRL 90 242001	B. Aubert <i>et al.</i>	(BABAR Collab.)
BESSION 03	PR D68 032002	D. Besson <i>et al.</i>	(CLEO Collab.)
KROKOVNY 03B	PRL 91 262002	P. Krokovny <i>et al.</i>	(BELLE Collab.)