

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

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

$J, P$  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
<b>2317.8±0.5 OUR FIT</b>				
<b>2318.0±0.7 OUR AVERAGE</b>				
2318.3±1.2±1.2	115	<sup>1</sup> 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	<sup>2</sup> AUBERT	04E BABR	10.6 $e^+e^-$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
2317.2±1.3	88	<sup>3</sup> AUBERT,B	04S BABR	$B \rightarrow D_{s0}^{(*)}(2317)^+ \bar{D}^{(*)}$
2317.2±0.5±0.9	761	<sup>4</sup> MIKAMI	04 BELL	10.6 $e^+e^-$
2316.8±0.4±3.0	1.2k	<sup>4,5</sup> AUBERT	03G BABR	10.6 $e^+e^-$
2317.6±1.3	273	<sup>4,6</sup> AUBERT	03G BABR	10.6 $e^+e^-$
2319.8±2.1±2.0	24	<sup>4</sup> KROKOVNY	03B BELL	10.6 $e^+e^-$

<sup>1</sup> 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.

<sup>2</sup> Supersedes AUBERT 03G.

<sup>3</sup> Systematic errors not evaluated.

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

<sup>5</sup> From  $D_s^+ \rightarrow K^+ K^- \pi^+$  decay.

<sup>6</sup> 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
<b>349.4±0.5 OUR FIT</b>				
<b>349.2±0.7 OUR AVERAGE</b>				
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	<sup>7</sup> 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	<sup>8,9</sup> AUBERT	03G BABR	10.6 $e^+e^-$
350.2±1.3	273	<sup>10,11</sup> AUBERT	03G BABR	10.6 $e^+e^-$

<sup>7</sup> Recalculated by us using  $m_{D_s^+} = 1968.5 \pm 0.6$  MeV.

<sup>8</sup> From  $D_s^+ \rightarrow K^+ K^- \pi^+$  decay.

<sup>9</sup> Recalculated by us using  $m_{D_s^+} = 1967.20 \pm 0.03$  MeV.

<sup>10</sup> From  $D_s^+ \rightarrow K^+ K^- \pi^+ \pi^0$  decay.

<sup>11</sup> 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
< <b>3.8</b>	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	BESSON	03 CLE2	$10.6 e^+ e^-$

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

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

Mode	Fraction ( $\Gamma_i/\Gamma$ )	Confidence level
$\Gamma_1$ $D_s^+ \pi^0$	$(100_{-20}^{+0})\%$	
$\Gamma_2$ $D_s^+ \gamma$	< 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

$\Gamma(D_s^+ \pi^0)/\Gamma_{\text{total}}$	VALUE	EVTS	DOCUMENT ID	TECN	COMMENT	$\Gamma_1/\Gamma$
	$1.00_{-0.14}^{+0.00+0.00}$	47	ABLIKIM	18J BES3	$4.6 e^+ e^- \rightarrow D_s^{*\pm} D_{s0}^*(2317)^\mp$	
	seen	1.5k	AUBERT	03G BABR	$10.6 e^+ e^-$	

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

$$\Gamma(D_s^+ \gamma) / \Gamma(D_s^+ \pi^0) \quad \Gamma_2 / \Gamma_1$$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;0.05</b>	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 $e^+ e^-$

$$\Gamma(D_s^*(2112)^+ \gamma) / \Gamma(D_s^+ \pi^0) \quad \Gamma_3 / \Gamma_1$$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;0.059</b>	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 $e^+ e^-$

$$\Gamma(D_s^+ \gamma \gamma) / \Gamma(D_s^+ \pi^0) \quad \Gamma_4 / \Gamma_1$$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;0.18</b>	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 $e^+ e^-$

$$\Gamma(D_s^*(2112)^+ \pi^0) / \Gamma(D_s^+ \pi^0) \quad \Gamma_5 / \Gamma_1$$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;0.11</b>	90	BESSION 03	CLE2	10.6 $e^+ e^-$

$$\Gamma(D_s^+ \pi^+ \pi^-) / \Gamma(D_s^+ \pi^0) \quad \Gamma_6 / \Gamma_1$$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;0.004</b>	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 $e^+ e^-$

$$\Gamma(D_s^+ \pi^0 \pi^0) / \Gamma(D_s^+ \pi^0) \quad \Gamma_7 / \Gamma_1$$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt;0.25</b>	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.)