NODE=M172

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

$I(J^P) = 0(0^+)$
J, P need confirmation.

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

NODE=M172

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

NODE=M172M

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.

NODE=M172M

NODE=M172M

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 $e^+e^- \to D_s^{*\pm} D_{s0}^*(2317)^\mp$
2319.6±0.2±1.4	3.1k	AUBERT	06P	BABR	10.6 $e^+e^- \to D_s^+\pi^0 X$
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	$B \to D_{s0}^{(*)}(2317)^+ \overline{D}^{(*)}$
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^-

NODE=M172M

OCCUR=2

[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.

NODE=M172M;LINKAGE=A

[2] Supersedes AUBERT 03G.

NODE=M172M;LINKAGE=AU

[3] Systematic errors not evaluated.

NODE=M172M;LINKAGE=AB

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

NODE=M172M;LINKAGE=B1

[5] From $D_s^+ \to K^+K^-\pi^+$ decay.

NODE=M172M;LINKAGE=A1

[6] From $D_s^+ \to K^+K^-\pi^+\pi^0$ decay.

NODE=M172M;LINKAGE=A2

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

NODE=M172DM

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.

NODE=M172DM

NODE=M172DM

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	BESSON	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^-

NODE=M172DM

OCCUR=2

[7] Recalculated by us using $m_{D_s^+} = 1968.5 \pm 0.6$ MeV.

NODE=M172DM;LINKAGE=K3

[8] From $D_s^+ \to K^+K^-\pi^+$ decay.

NODE=M172DM;LINKAGE=A1

[9] Recalculated by us using $m_{D_s^+} = 1967.20 \pm 0.03$ MeV.

NODE=M172DM;LINKAGE=C1

[10] From $D_s^+ \to K^+K^-\pi^+\pi^0$ decay.

NODE=M172DM;LINKAGE=A2

[11] Recalculated by us using $m_{D_s^+} = 1967.4 \pm 0.2$ MeV. Systematic errors not estimated.

NODE=M172DM;LINKAGE=C2

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

NODE=M172W

VALUE (MeV)	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
< 3.8	95	3180	AUBERT	06P	BABR	10.6 $e^+e^- \to D_s^+\pi^0 X$
• • • 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^-

NODE=M172W

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

NODE=M172215;NODE=M172

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

NODE=M172

	Mode	Fraction (Γ_i/Γ)	Confidence level	
Γ_1	$D_s^+\pi^0$	(100^{+0}_{-20}) %		DESIG=1
Γ_2	$D_s^+\gamma$	$<$ 5 %	90%	DESIG=2
Γ_3	$D_s^*(2112)^+\gamma$	$<$ 6 %	90%	DESIG=3
Γ_4	$D_s^+\gamma\gamma$	$<$ 18 %	95%	DESIG=4
Γ_5	$D_s^*(2112)^+\pi^0$	$<$ 11 %	90%	DESIG=5
Γ_6	$D_s^+\pi^+\pi^-$	$<$ 4 $\times 10^{-3}$	90%	DESIG=6
Γ_7	$D_s^+\pi^0\pi^0$	not seen		DESIG=7;OUR EVAL;→ UNCHECKED ←

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

NODE=M172220

$\Gamma(D_s^+\pi^0)/\Gamma_{\text{total}}$ Γ_1/Γ

NODE=M172R1
NODE=M172R1

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
$1.00^{+0.00+0.00}_{-0.14-0.14}$	47	ABLIKIM	18J	BES3	4.6 $e^+e^-\to D_s^{*\pm}D_{s0}^*(2317)^\mp$
• • • 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

NODE=M172R5
NODE=M172R5

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	BESSON	03	CLE2	10.6 e^+e^-

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

NODE=M172R6
NODE=M172R6

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.059	90	BESSON	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

NODE=M172R7
NODE=M172R7

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

NODE=M172R8
NODE=M172R8

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

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

NODE=M172R9
NODE=M172R9

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	BESSON	03	CLE2	10.6 e^+e^-

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

NODE=M172R10
NODE=M172R10

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

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

NODE=M172

ABLIKIM	18J	PR D97 051103	M. Ablikim *et al.*	(BESIII Collab.)	REFID=58895
CHOI	15A	PR D91 092011	S.-K. Choi *et al.*	(BELLE Collab.)	REFID=56577
AUBERT	06P	PR D74 032007	B. Aubert *et al.*	(BABAR Collab.)	REFID=51144
AUBERT	04E	PR D69 031101	B. Aubert *et al.*	(BABAR Collab.)	REFID=49747
AUBERT,B	04S	PRL 93 181801	B. Aubert *et al.*	(BABAR Collab.)	REFID=50195
MIKAMI	04	PRL 92 012002	Y. Mikami *et al.*	(BELLE Collab.)	REFID=49629
AUBERT	03G	PRL 90 242001	B. Aubert *et al.*	(BABAR Collab.)	REFID=49417
BESSON	03	PR D68 032002	D. Besson *et al.*	(CLEO Collab.)	REFID=49583
KROKOVNY	03B	PRL 91 262002	P. Krokovny *et al.*	(BELLE Collab.)	REFID=49615