$D_{s1}(2460)^{\pm}$

$I(J^P) = 0(1^+)$

$D_{s1}(2460)^{\pm}$ MASS

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
2459.6±0.6 OUR FIT Error includes scale factor of 1.1.					
2459.6±0.9 OUR AVERAGE Error includes scale factor of 1.3.					
2460.1±0.2±0.8		[1] AUBERT	06P	BABR	10.6 e^+e^-
2458.0±1.0±1.0	195	AUBERT	04E	BABR	10.6 e^+e^-
• • • We do not use the following data for averages, fits, limits, etc. • • •					
2459.5±1.2±3.7	920	AUBERT	06P	BABR	10.6 $e^+e^- \rightarrow D_s^+\gamma X$
2458.6±1.0±2.5	560	AUBERT	06P	BABR	10.6 $e^+e^- \rightarrow D_s^+\pi^0\gamma X$
2460.2±0.2±0.8	123	AUBERT	06P	BABR	10.6 $e^+e^- \rightarrow D_s^+\pi^+\pi^- X$
2458.9±1.5	112	[2] AUBERT,B	04S	BABR	$B \rightarrow D_{s1}(2460)^+\overline{D}^{(*)}$
2461.1±1.6	139	[3] AUBERT,B	04S	BABR	$B \rightarrow D_{s1}(2460)^+\overline{D}^{(*)}$
2456.5±1.3±1.3	126	[4,5] MIKAMI	04	BELL	10.6 e^+e^-
2459.5±1.3±2.0	152	[6,7] MIKAMI	04	BELL	10.6 e^+e^-
2459.9±0.9±1.6	60	[6,7] MIKAMI	04	BELL	10.6 e^+e^-
2459.2±1.6±2.0	57	KROKOVNY	03B	BELL	10.6 e^+e^-

[1] The average of the values obtained from the $D_s^+\gamma$, $D_s^+\pi^0\gamma$,$D_s^+\pi^+\pi^-$ final state.

[2] Systematic errors not evaluated. From the decay to $D_s^{*+}\pi^0$.

[3] Systematic errors not evaluated. From the decay to $D_s^+\gamma$.

[4] Not independent of the corresponding $m_{D_{s1}(2460)^{\pm}} - m_{D_s^{*\pm}}$.

[5] Using $m_{D_s^{*+}} = 2112.4 \pm 0.7$ MeV.

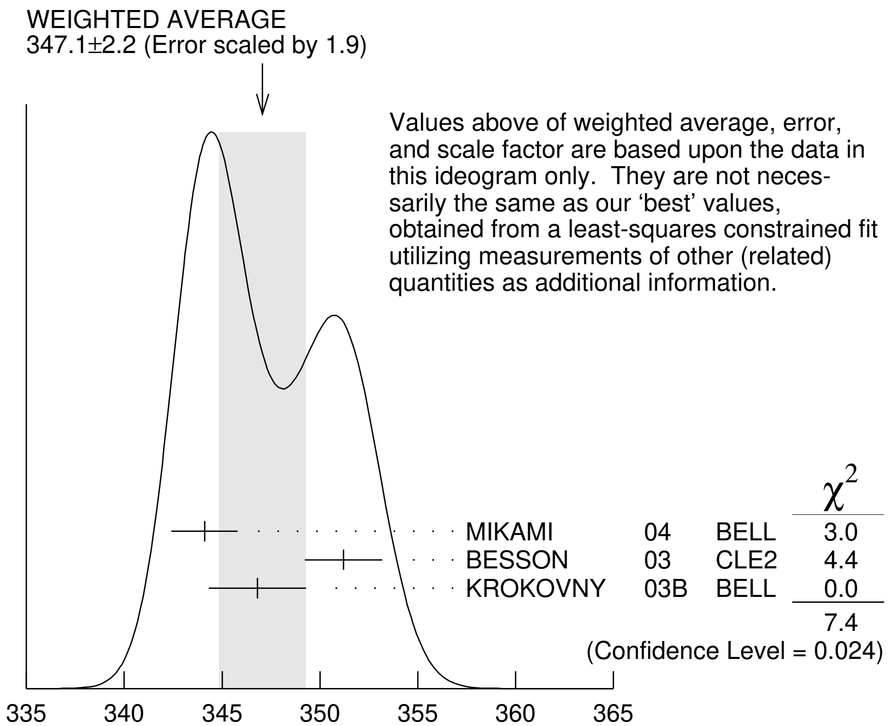
[6] Not independent of the corresponding $m_{D_{s1}(2460)^{\pm}} - m_{D_s^{\pm}}$.

[7] Using $m_{D_s^+} = 1968.5 \pm 0.6$ MeV.

$m_{D_{s1}(2460)^{\pm}} - m_{D_s^{*\pm}}$

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
347.2±0.8 OUR FIT Error includes scale factor of 1.2.					
347.1±2.2 OUR AVERAGE Error includes scale factor of 1.9. See the ideogram below.					
344.1±1.3±1.1	126	MIKAMI	04	BELL	10.6 e^+e^-
351.2±1.7±1.0	41	BESSON	03	CLE2	10.6 e^+e^-
346.8±1.6±1.9	57	[8] KROKOVNY	03B	BELL	10.6 e^+e^-

[8] Recalculated by us using $m_{D_s^{*+}} = 2112.4 \pm 0.7$ MeV.



$m_{D_{s1}(2460)^\pm} - m_{D_s^{*\pm}}$

$m_{D_{s1}(2460)^\pm} - m_{D_s^\pm}$

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
491.1±0.7 OUR FIT	Error includes scale factor of 1.1.				
491.3±1.4 OUR AVERAGE					
491.0±1.3±1.9	152	[9] MIKAMI	04	BELL	10.6 e^+e^-
491.4±0.9±1.5	60	[10] MIKAMI	04	BELL	10.6 e^+e^-

[9] From the decay to $D_s^\pm \gamma$.

[10] From the decay to $D_s^\pm \pi^+ \pi^-$.

$D_{s1}(2460)^\pm$ WIDTH

VALUE (MeV)	*CL%*	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
< 3.5	95	123	AUBERT	06P	BABR	10.6 $e^+e^- \rightarrow D_s^+ \pi^+ \pi^- X$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
< 6.3	95	560	AUBERT	06P	BABR	10.6 $e^+e^- \rightarrow D_s^+ \pi^0 \gamma X$
<10		195	AUBERT	04E	BABR	10.6 e^+e^-
< 5.5	90	126	MIKAMI	04	BELL	10.6 e^+e^-
< 7	90	41	BESSON	03	CLE2	10.6 e^+e^-

$D_{s1}(2460)^+$ DECAY MODES

$D_{s1}(2460)^-$ modes are charge conjugates of the modes below.

	Mode	Fraction (Γ_i/Γ)	Scale factor/ Confidence level
Γ_1	$D_s^{*+}\pi^0$	(48 ± 11) %	
Γ_2	$D_s^+\gamma$	(18 ± 4) %	
Γ_3	$D_s^+\pi^+\pi^-$	(4.3 ± 1.3) %	S=1.1
Γ_4	$D_s^{*+}\gamma$	< 8 %	CL=90%
Γ_5	$D_{s0}^*(2317)^+\gamma$	$(3.7^{+5.1}_{-2.4})$ %	
Γ_6	$D_s^+\pi^0$		
Γ_7	$D_s^+\pi^0\pi^0$		
Γ_8	$D_s^+\gamma\gamma$		

CONSTRAINED FIT INFORMATION

An overall fit to 7 branching ratios uses 8 measurements and one constraint to determine 5 parameters. The overall fit has a $\chi^2 =$ 3.4 for 4 degrees of freedom.

The following *off-diagonal* array elements are the correlation coefficients $\left\langle\delta x_i \delta x_j\right\rangle/(\delta x_i \cdot \delta x_j)$, in percent, from the fit to the branching fractions, $x_i \equiv \Gamma_i/\Gamma_{\text{total}}$. The fit constrains the x_i whose labels appear in this array to sum to one.

x_2	80		
x_3	68	62	
x_5	−3	25	26
	x_1	x_2	x_3

$D_{s1}(2460)^\pm$ BRANCHING RATIOS

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.48±0.11 OUR FIT					
0.56±0.13±0.09		[11] AUBERT	06N	BABR	$B \to D_{s1}(2460)^-\overline{D}^{(*)}$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
seen	41	BESSON	03	CLE2	10.6 e^+e^-

[11] Evaluated in AUBERT 06N including measurements from AUBERT,B 04S.

$\Gamma(D_s^+\gamma)/\Gamma_{\text{total}}$ — Γ_2/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
0.18±0.04 OUR FIT				
0.16±0.04±0.03	[12] AUBERT	06N	BABR	$B \to D_{s1}(2460)^-\overline{D}^{(*)}$

[12] Evaluated in AUBERT 06N including measurements from AUBERT,B 04S.

$\Gamma(D_s^+\gamma)/\Gamma(D_s^{*+}\pi^0)$ — Γ_2/Γ_1

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
0.38 ±0.05 OUR FIT						
0.44 ±0.09 OUR AVERAGE						
0.55 ±0.13 ±0.08		152	MIKAMI	04	BELL	10.6 e^+e^-
0.38 ±0.11 ±0.04		38	KROKOVNY	03B	BELL	10.6 e^+e^-
• • • We do not use the following data for averages, fits, limits, etc. • • •						
0.274±0.045±0.020		251	[13] AUBERT,B	04S	BABR	$B \to D_{s1}(2460)^+ \overline{D}^{(*)}$
< 0.49	90		BESSON	03	CLE2	10.6 e^+e^-

[13] Used by AUBERT 06N in their measurement of B($D_s^{*-}\pi^0$) and B($D_s^-\gamma$).

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

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
0.090±0.020 OUR FIT Error includes scale factor of 1.2.						
0.14 ±0.04 ±0.02		60	MIKAMI	04	BELL	10.6 e^+e^-
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<0.08	90		BESSON	03	CLE2	10.6 e^+e^-

$\Gamma(D_s^{*+}\gamma)/\Gamma(D_s^{*+}\pi^0)$ — Γ_4/Γ_1

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.16	90	BESSON	03	CLE2	10.6 e^+e^-
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.31	90	MIKAMI	04	BELL	10.6 e^+e^-

$\Gamma(D_{s0}^*(2317)^+\gamma)/\Gamma(D_s^{*+}\pi^0)$ — Γ_5/Γ_1

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.22	95	AUBERT	04E	BABR	10.6 e^+e^-
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.58	90	BESSON	03	CLE2	10.6 e^+e^-

$\Gamma(D_s^{*+}\pi^0)/[\Gamma(D_s^{*+}\pi^0)+\Gamma(D_{s0}^*(2317)^+\gamma)]$ — $\Gamma_1/(\Gamma_1+\Gamma_5)$

VALUE	DOCUMENT ID		TECN	COMMENT
0.93±0.09 OUR FIT				
0.97±0.09±0.05	AUBERT	06P	BABR	10.6 e^+e^-

$\Gamma(D_s^+\gamma)/[\Gamma(D_s^{*+}\pi^0)+\Gamma(D_{s0}^*(2317)^+\gamma)]$ — $\Gamma_2/(\Gamma_1+\Gamma_5)$

VALUE	DOCUMENT ID		TECN	COMMENT
0.35 ±0.04 OUR FIT				
0.337±0.036±0.038	AUBERT	06P	BABR	10.6 e^+e^-

$\Gamma(D_s^+\pi^+\pi^-)/[\Gamma(D_s^{*+}\pi^0)+\Gamma(D_{s0}^*(2317)^+\gamma)]$ — $\Gamma_3/(\Gamma_1+\Gamma_5)$

VALUE	DOCUMENT ID		TECN	COMMENT
0.083±0.017 OUR FIT Error includes scale factor of 1.2.				
0.077±0.013±0.008	AUBERT	06P	BABR	10.6 e^+e^-

$\Gamma(D_s^{*+}\gamma)/[\Gamma(D_s^{*+}\pi^0)+\Gamma(D_{s0}^*(2317)^+\gamma)]$ — $\Gamma_4/(\Gamma_1+\Gamma_5)$

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.24	95	AUBERT	06P	BABR	10.6 e^+e^-

$\Gamma(D_{s0}^*(2317)^+\gamma)/[\Gamma(D_s^{*+}\pi^0)+\Gamma(D_{s0}^*(2317)^+\gamma)]$ $\Gamma_5/(\Gamma_1+\Gamma_5)$

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

$\Gamma(D_s^+\pi^0)/[\Gamma(D_s^{*+}\pi^0)+\Gamma(D_{s0}^*(2317)^+\gamma)]$ $\Gamma_6/(\Gamma_1+\Gamma_5)$

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.042	95	AUBERT	06P	BABR	10.6 e^+e^-

$\Gamma(D_s^+\pi^0\pi^0)/[\Gamma(D_s^{*+}\pi^0)+\Gamma(D_{s0}^*(2317)^+\gamma)]$ $\Gamma_7/(\Gamma_1+\Gamma_5)$

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.68	95	AUBERT	06P	BABR	10.6 e^+e^-

$\Gamma(D_s^+\gamma\gamma)/[\Gamma(D_s^{*+}\pi^0)+\Gamma(D_{s0}^*(2317)^+\gamma)]$ $\Gamma_8/(\Gamma_1+\Gamma_5)$

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.33	95	AUBERT	06P	BABR	10.6 e^+e^-

$D_{s1}(2460)^\pm$ REFERENCES

AUBERT	06N	PR D74 031103R	B. Aubert et al.	(BABAR Collab.)
AUBERT	06P	PR D74 032007	B. Aubert et al.	(BABAR Collab.)
AUBERT	04E	PR D69 031101R	B. Aubert et al.	(BABAR Collab.)
AUBERT,B	04S	PRL 93 181801	B. Aubert et al.	(BABAR Collab.)
MIKAMI	04	PRL 92 012002	Y. Mikami et al.	(BELLE Collab.)
BESSON	03	PR D68 032002	D. Besson et al.	(CLEO Collab.)
KROKOVNY	03B	PRL 91 262002	P. Krokovny et al.	(BELLE Collab.)

OTHER RELATED PAPERS

WANG	07	PR D75 034013	Z.-G. Wang	
COLANGELO	06	PL B642 48	P. Colangelo et al.	
SWANSON	06	PRPL 429 243	E.S. Swanson	(PITT)
VIJANDE	06	PR D73 034002	J. Vijande, F. Fernandez, A. Valcarce	
WEI	06	PR D73 034004	W. Wei, P.-Z. Huang, S.-L. Zhu	
BICUDO	05	NP A748 537	P. Bicudo	
CLOSE	05C	PR D72 094004	F.E. Close, E.S. Swanson	(OXFTP)
COLANGELO	05	PR D72 074004	P. Colangelo, F. De Fazio, A. Ozpineci	
GODFREY	05	PR D72 054029	S. Godfrey	
MAIANI	05	PR D71 014028	L. Maiani et al.	
YAMADA	05	PR C72 065202	Y. Yamada et al.	
ZHANG	05C	PR D72 017902	A. Zhang	
BROWDER	04	PL B578 365	T.E. Browder, S. Pakvasa, A.A. Petrov	
CHEN	04A	PR D69 054002	C.-H. Chen	
CHEN	04C	PRL 93 232001	Y.-Q. Chen, X.-Q. Li	
COHEN	04	PL B578 359	T.D. Cohen et al.	
DMITRASINO...	04	PR D70 096011	V. Dmitrasinovic	
FAYYAZUDDIN	04	PR D69 114008	Fayyazuddin, Riazuddin	
KOLOMEITSEV	04	PL B582 39	E.E. Kolomeitsev, M.F.M. Lutz	
SADZIKOWSKI	04	PL B579 39	M. Sadzikowski	
VANBEVEREN	04B	EPJ C32 493	E. van Beveren, G. Rupp	
AUBERT	03G	PRL 90 242001	B. Aubert et al.	(BaBar Collab.)
BARDEEN	03	PR D68 054024	W.A. Bardeen et al.	
BARNES	03	PR D68 054006	T. Barnes et al.	
CAHN	03	PR D68 037502	R.N. Cahn, J.D. Jackson	
COLANGELO	03B	PL B570 180	P. Colangelo, F. De Fazio	
DATTA	03C	PL B572 164	A. Datta, P.J. O'Donnell	