CHARMED, STRANGE MESONS ($C = S = \pm 1$)

$D_s^+ = c\overline{s}$, $D_s^- = \overline{c}s$, similarly for D_s^*'s

$D_s^{*\pm}$

$I(J^P) = ?(?^?)$

$D_s^{*\pm}$ MASS

The fit includes $D^\pm$, D^0, $D_s^\pm$, $D^{*\pm}$, D^{*0}, and $D_s^{*\pm}$ mass and mass difference measurements.

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
2112.4±0.8 OUR FIT	Error includes scale factor of 1.1.			
2106.6±2.1±2.7	[1] BLAYLOCK	87	MRK3	$e^+e^- \rightarrow D_s^\pm \gamma X$

[1] Assuming $D_s^\pm$ mass $= 1968.7 \pm 0.9$ MeV.

$m_{D_s^{*\pm}} - m_{D_s^\pm}$

The fit includes $D^\pm$, D^0, $D_s^\pm$, $D^{*\pm}$, D^{*0}, and $D_s^{*\pm}$ mass and mass difference measurements.

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
143.9 ± 0.6 OUR FIT					
144.0 ± 0.6 OUR AVERAGE					
144.22± 0.47±0.37		BROWN	94	CLE2	e^+e^-
142.5 ± 0.8 ±1.5		[2] ALBRECHT	88	ARG	$e^+e^- \rightarrow D_s^\pm \gamma X$
143.0 ±18.0	8	ASRATYAN	85	HLBC	FNAL 15-ft, ν-^{2}H
139.5 ± 8.3 ±9.7	60	AIHARA	84D	TPC	$e^+e^- \rightarrow$ hadrons
110 ±46		BRANDELIK	79	DASP	$e^+e^- \rightarrow D_s^\pm \gamma X$

[2] Result includes data of ALBRECHT 84B.

$D_s^{*\pm}$ WIDTH

VALUE (MeV)	*CL%*	*DOCUMENT ID*		*TECN*	*COMMENT*
< 4.5	90	ALBRECHT	88	ARG	$E_{\rm cm}^{ee} = 10.2$ GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
< 4.9	90	BROWN	94	CLE2	e^+e^-
<22	90	BLAYLOCK	87	MRK3	$e^+e^- \rightarrow D_s^\pm \gamma X$

D_s^{*+} DECAY MODES

D_s^{*-} modes are charge conjugates of the modes below.

	Mode	Fraction (Γ_i/Γ)
Γ_1	$D_s^+\gamma$	dominant

D_s^{*+} BRANCHING RATIOS

$\Gamma(D_s^+\gamma)/\Gamma_{\rm total}$ **Γ_1/Γ**

VALUE	*DOCUMENT ID*		*TECN*	*COMMENT*
dominant OUR EVALUATION				
• • • We do not use the following data for averages, fits, limits, etc. • • •				
seen	ASRATYAN	91	HLBC	$\overline{\nu}_\mu$ Ne
seen	ALBRECHT	88	ARG	$e^+e^- \rightarrow D_s^\pm \gamma X$
seen	AIHARA	84D		
seen	ALBRECHT	84B		
seen	BRANDELIK	79		

*CITATION: L. Montanet et al., Physical Review D50, 1173 (1994) and 1995 off-year partial update for the 1996 edition (URL: http://pdg.lbl.gov/)

$D_s^{*\pm}$ REFERENCES

BROWN	94	PR D50 1884	+Fast, McIlwain, Miao+	(CLEO Collab.)
ASRATYAN	91	PL B257 525	+Marage+(ITEP, BELG, SACL, SERP, CRAC, BARI, CERN)	
ALBRECHT	88	PL B207 349	+Binder, Boeckmann+	(ARGUS Collab.)
BLAYLOCK	87	PRL 58 2171	+Bolton, Brown, Bunnell+	(Mark III Collab.)
ASRATYAN	85	PL 156B 441	+Fedotov, Ammosov, Burtovoy+	(ITEP, SERP)
AIHARA	84D	PRL 53 2465	+Alston-Garnjost, Badtke, Bakken+	(TPC Collab.)
ALBRECHT	84B	PL 146B 111	+Drescher, Heller+	(ARGUS Collab.)
BRANDELIK	79	PL 80B 412	+Braunschweig, Martyn, Sander+	(DASP Collab.)

OTHER RELATED PAPERS

KAMAL	92	PL B284 421	+Xu	(ALBE)
BRANDELIK	78C	PL 76B 361	+Cords+	(DASP Collab.)
BRANDELIK	77B	PL 70B 132	+Braunschweig, Martyn, Sander+	(DASP Collab.)

$D_{s1}(2536)^{\pm}$

$I(J^P) = 0(1^+)$
I, J, P need confirmation.

Seen in $D^*(2010)^+ K^0$. Not seen in $D^+ K^0$ or $D^0 K^+$. $J^P = 1^+$ assignment strongly favored.

$D_{s1}(2536)^{\pm}$ MASS

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
2535.35± 0.34 OUR AVERAGE					
2534.2 ± 1.2	9	ASRATYAN	94	BEBC	$\nu N \to D^* K^0 X, D^{*0} K^{\pm} X$
2535.0 ± 0.6 ±1.0	75 ± 14	FRABETTI	94B	E687	$\gamma \text{Be} \to D^{*+} K^0 X, D^{*0} K^+ X$
2535.3 ± 0.2 ±0.5	134± 22	ALEXANDER	93	CLE2	$e^+ e^- \to D^{*0} K^+ X$
2534.8 ± 0.6 ±0.6	44 ± 8	ALEXANDER	93	CLE2	$e^+ e^- \to D^{*+} K^0 X$
2535.2 ± 0.5 ±1.5	28	ALBRECHT	92R	ARG	$10.4\ e^+ e^- \to D^{*0} K^+ X$
2536.6 ± 0.7 ±0.4		AVERY	90	CLEO	$e^+ e^- \to D^{*+} K^0 X$
2535.9 ± 0.6 ±2.0		ALBRECHT	89E	ARG	$D^*_{s1} \to D^*(2010) K^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
2535 ±28		[1] ASRATYAN	88	HLBC	$\nu N \to D_s \gamma \gamma X$

[1] Not seen in $D^* K$.

$m_{D_{s1}(2536)^{\pm}} - m_{D_s^*(2111)}$

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
424±28	ASRATYAN	88	HLBC	$D_s^{*\pm} \gamma$

$D_{s1}(2536)^{\pm}$ WIDTH

VALUE (MeV)	*CL%*	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
<2.3	90		ALEXANDER	93	CLEO	$e^+ e^- \to D^{*0} K^+ X$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<3.2	90	75 ± 14	FRABETTI	94B	E687	$\gamma \text{Be} \to D^{*+} K^0 X, D^{*0} K^+ X$
<3.9	90		ALBRECHT	92R	ARG	$10.4\ e^+ e^- \to D^{*0} K^+ X$
<5.44	90		AVERY	90	CLEO	$e^+ e^- \to D^{*+} K^0 X$
<4.6	90		ALBRECHT	89E	ARG	$D^*_{s1} \to D^*(2010) K^0$

$D_{s1}(2536)^+$ DECAY MODES

$D_{s1}(2536)^-$ modes are charge conjugates of the modes below.

	Mode	Fraction (Γ_i/Γ)
Γ_1	$D^*(2010)^+ K^0$	seen
Γ_2	$D^*(2007)^0 K^+$	seen
Γ_3	$D^+ K^0$	not seen
Γ_4	$D^0 K^+$	not seen
Γ_5	$D_s^{*+} \gamma$	possibly seen

*CITATION: L. Montanet et al., Physical Review D50, 1173 (1994) and 1995 off-year partial update for the 1996 edition (URL: http://pdg.lbl.gov/)

$D_{s1}(2536)^+$ BRANCHING RATIOS

$\Gamma(D^+ K^0)/\Gamma(D^*(2010)^+ K^0)$ — Γ_3/Γ_1

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.40	90	ALEXANDER	93	CLEO	$e^+ e^- \rightarrow D^{*+} K^0 X$
<0.43	90	ALBRECHT	89E	ARG	$D^*_{s1} \rightarrow D^*(2010) K^0$

$\Gamma(D_s^{*+} \gamma)/\Gamma_{total}$ — Γ_5/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
possibly seen	ASRATYAN	88	HLBC	$\nu N \rightarrow D_s \gamma\gamma X$

$\Gamma(D^0 K^+)/\Gamma(D^*(2007)^0 K^+)$ — Γ_4/Γ_2

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.12	90	ALEXANDER	93	CLEO	$e^+ e^- \rightarrow D^{*0} K^+ X$

$\Gamma(D_s^{*+} \gamma)/\Gamma(D^*(2007)^0 K^+)$ — Γ_5/Γ_2

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
<0.42	90	ALEXANDER	93	CLEO	$e^+ e^- \rightarrow D^{*0} K^+ X$

$D_{s1}(2536)^\pm$ REFERENCES

ASRATYAN	94	ZPHY C 61 563	+Aderholz+	(BIRM, BELG, CERN, SERP, ITEP, RAL)
FRABETTI	94B	PRL 72 324	+Cheung, Cumalat+	(FNAL E687 Collab.)
ALEXANDER	93	PL B303 377	+Bebek+	(CLEO Collab.)
ALBRECHT	92R	PL B297 425	+Ehrlichmann+	(ARGUS Collab.)
AVERY	90	PR D41 774	+Besson	(CLEO Collab.)
ALBRECHT	89E	PL B230 162	+Glaser, Harder+	(ARGUS Collab.)
ASRATYAN	88	ZPHY C40 483	+Fedotov+	(ITEP, SERP)

$D_{sJ}(2573)^\pm$

$I(J^P) = ?(?^?)$

OMITTED FROM SUMMARY TABLE

J^P is natural, width and decay modes consistent with 2^+. Needs confirmation.

$D_{sJ}(2573)^\pm$ MASS

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	CHG	COMMENT
$\mathbf{2573.2^{+1.7}_{-1.6} \pm 0.9}$	217	KUBOTA	94	CLE2	+	$e^+ e^- \sim$ 10.5 GeV

$D_{sJ}(2573)^\pm$ WIDTH

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	CHG	COMMENT
$\mathbf{16^{+5}_{-4} \pm 3}$	217	KUBOTA	94	CLE2	+	$e^+ e^- \sim$ 10.5 GeV

$D_{sJ}(2573)^+$ DECAY MODES

$D_{sJ}(2573)^-$ modes are charge conjugates of the modes below.

	Mode	Fraction (Γ_i/Γ)
Γ_1	$D^0 K^+$	seen
Γ_2	$D^*(2007)^0 K^+$	seen

$D_{sJ}(2573)^+$ BRANCHING RATIOS

$\Gamma(D^0 K^+)/\Gamma_{total}$ — Γ_1/Γ

VALUE	EVTS	DOCUMENT ID		TECN	CHG	COMMENT
seen	217	KUBOTA	94	CLE2	±	$e^+ e^- \sim$ 10.5 GeV

$\Gamma(D^*(2007)^0 K^+)/\Gamma(D^0 K^+)$ — Γ_2/Γ_1

VALUE	CL%	DOCUMENT ID		TECN	CHG	COMMENT
<0.33	90	KUBOTA	94	CLE2	+	$e^+ e^- \sim$ 10.5 GeV

$D_{sJ}(2573)^{\pm}$ REFERENCES

KUBOTA 94 PRL 72 1972 +Lattery, Nelson, Patton+ (CLEO II Collab.)