



$$I(J^P) = 0(?^?)$$

$J^P$  is natural, width and decay modes consistent with  $1^-$ .

### $D_s^{*\pm}$ 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)	DOCUMENT ID	TECN	COMMENT
<b>2112.2 ± 0.4 OUR FIT</b>			
<b>2106.6 ± 2.1 ± 2.7</b>	<sup>1</sup> BLAYLOCK 87	MRK3	$e^+e^- \rightarrow D_s^\pm \gamma X$
<sup>1</sup> Assuming $D_s^\pm$ mass = 1968.7 ± 0.9 MeV.			

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

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

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
<b>143.8 ± 0.4 OUR FIT</b>				
<b>143.9 ± 0.4 OUR AVERAGE</b>				
143.76 ± 0.39 ± 0.40		GRONBERG 95	CLE2	$e^+e^-$
144.22 ± 0.47 ± 0.37		BROWN 94	CLE2	$e^+e^-$
142.5 ± 0.8 ± 1.5		<sup>2</sup> ALBRECHT 88	ARG	$e^+e^- \rightarrow D_s^\pm \gamma X$
139.5 ± 8.3 ± 9.7	60	AIHARA 84D	TPC	$e^+e^- \rightarrow$ hadrons
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
143.0 ± 18.0	8	ASRATYAN 85	HLBC	FNAL 15-ft, $\nu$ - <sup>2</sup> H
110 ± 46		BRANDELIK 79	DASP	$e^+e^- \rightarrow D_s^\pm \gamma X$

<sup>2</sup> Result includes data of ALBRECHT 84B.

### $D_s^{*\pm}$ WIDTH

VALUE (MeV)	CL%	DOCUMENT ID	TECN	COMMENT
<b>&lt; 1.9</b>	90	GRONBERG 95	CLE2	$e^+e^-$
< 4.5	90	ALBRECHT 88	ARG	$E_{cm}^{ee} = 10.2$ 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 ( $\Gamma_i/\Gamma$ )
$\Gamma_1 \quad D_s^+ \gamma$	$(93.5 \pm 0.7) \%$
$\Gamma_2 \quad D_s^+ \pi^0$	$(5.8 \pm 0.7) \%$
$\Gamma_3 \quad D_s^+ e^+ e^-$	$(6.7 \pm 1.6) \times 10^{-3}$

### CONSTRAINED FIT INFORMATION

An overall fit to 2 branching ratios uses 3 measurements and one constraint to determine 3 parameters. The overall fit has a  $\chi^2 = 0.0$  for 1 degrees of freedom.

The following *off-diagonal* array elements are the correlation coefficients  $\langle \delta x_i \delta x_j \rangle / (\delta x_i \delta x_j)$ , 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.

$x_2$	$-97$	
$x_3$	$-19$	$-4$
	$x_1$	$x_2$

### $D_s^{*+}$ BRANCHING RATIOS

$\Gamma(D_s^+ \gamma) / \Gamma_{\text{total}}$	$\Gamma_1 / \Gamma$
<u>VALUE</u>	<u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>
<b><math>0.935 \pm 0.007</math> OUR FIT</b>	

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

seen	ASRATYAN	91	HLBC	$\bar{\nu}_\mu \text{Ne}$
seen	ALBRECHT	88	ARG	$e^+ e^- \rightarrow D_s^\pm \gamma X$
seen	AIHARA	84D		
seen	ALBRECHT	84B		
seen	BRANDELIK	79		

$\Gamma(D_s^+ \pi^0) / \Gamma(D_s^+ \gamma)$	$\Gamma_2 / \Gamma_1$
<u>VALUE</u>	<u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>

<b><math>0.062 \pm 0.008</math> OUR FIT</b>	
<b><math>0.062 \pm 0.008</math> OUR AVERAGE</b>	
$0.062 \pm 0.005 \pm 0.006$	AUBERT, BE    05G    BABR $10.6 e^+ e^- \rightarrow \text{hadrons}$
$0.062^{+0.020}_{-0.018} \pm 0.022$	GRONBERG    95    CLE2 $e^+ e^-$

$\Gamma(D_s^+ e^+ e^-) / \Gamma(D_s^+ \gamma)$	$\Gamma_3 / \Gamma_1$
<u>VALUE (units <math>10^{-3}</math>)</u>	<u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>

<b><math>7.2 \pm 1.7</math> OUR FIT</b>	
<b><math>7.2^{+1.5}_{-1.3} \pm 1.0</math></b>	38    CRONIN-HEN..12    CLEO $4.17 e^+ e^- \rightarrow \text{hadrons}$

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## $D_s^{*\pm}$ REFERENCES

CRONIN-HEN... 12	PR D86 072005	D. Cronin-Hennessey <i>et al.</i>	(CLEO Collab.)
AUBERT,BE 05G	PR D72 091101	B. Aubert <i>et al.</i>	(BABAR Collab.)
GRONBERG 95	PRL 75 3232	J. Gronberg <i>et al.</i>	(CLEO Collab.)
BROWN 94	PR D50 1884	D. Brown <i>et al.</i>	(CLEO Collab.)
ASRATYAN 91	PL B257 525	A.E. Asratyan <i>et al.</i>	(ITEP, BELG, SACL+)
ALBRECHT 88	PL B207 349	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
BLAYLOCK 87	PRL 58 2171	G.T. Blaylock <i>et al.</i>	(Mark III Collab.)
ASRATYAN 85	PL 156B 441	A.E. Asratyan <i>et al.</i>	(ITEP, SERP)
AIHARA 84D	PRL 53 2465	H. Aihara <i>et al.</i>	(TPC Collab.)
ALBRECHT 84B	PL 146B 111	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
BRANDELIK 79	PL 80B 412	R. Brandelik <i>et al.</i>	(DASP Collab.)

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