

# $\Sigma_c(2520)$

$$I(J^P) = 1(\frac{3}{2}^+) \text{ Status: } ***$$

Seen in the  $\Lambda_c^+ \pi^\pm$  mass spectrum. The natural assignment is that this is the  $J^P = 3/2^+$  excitation of the  $\Sigma_c(2455)$ , the charm counterpart of the  $\Sigma(1385)$ , but neither  $J$  nor  $P$  has been measured.

## $\Sigma_c(2520)$ MASSES

The masses are obtained from the mass-difference measurements that follow.

### $\Sigma_c(2520)^{++}$ MASS

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
<b>2519.4 ± 1.5 OUR FIT</b>				

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

2530 ± 5 ± 5	6	<sup>1</sup> AMMOSOV	93	HLBC $\nu p \rightarrow \mu^- \Sigma_c(2530)^{++}$
<sup>1</sup> AMMOSOV 93 sees a cluster of 6 events and estimates the background to be 1 event.				

### $\Sigma_c(2520)^+$ MASS

VALUE (MeV)	DOCUMENT ID
<b>2515.9 ± 2.4 OUR FIT</b>	

### $\Sigma_c(2520)^0$ MASS

VALUE (MeV)	DOCUMENT ID
<b>2517.5 ± 1.4 OUR FIT</b>	

## $\Sigma_c(2520)$ MASS DIFFERENCES

### $m_{\Sigma_c(2520)^{++}} - m_{\Lambda_c^+}$

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
<b>234.5 ± 1.4 OUR FIT</b>				
<b>234.5 ± 1.1 ± 0.8</b>	677	BRANDENB...	97	CLE2 $e^+ e^- \approx \Upsilon(4S)$

### $m_{\Sigma_c(2520)^+} - m_{\Lambda_c^+}$

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
<b>231.0 ± 2.3 OUR FIT</b>				
<b>231.0 ± 1.1 ± 2.0</b>	327	AMMAR	01	CLE2 $e^+ e^- \approx \Upsilon(4S)$

### $m_{\Sigma_c(2520)^0} - m_{\Lambda_c^+}$

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
<b>232.6 ± 1.3 OUR FIT</b>				
<b>232.6 ± 1.0 ± 0.8</b>	504	BRANDENB...	97	CLE2 $e^+ e^- \approx \Upsilon(4S)$

### $m_{\Sigma_c(2520)^{++}} - m_{\Sigma_c(2520)^0}$

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
<b>1.9 ± 1.7 OUR FIT</b>			
<b>1.9 ± 1.4 ± 1.0</b>	<sup>2</sup> BRANDENB...	97	CLE2 $e^+ e^- \approx \Upsilon(4S)$

<sup>2</sup> This BRANDENBURG 97 result is redundant with measurements in earlier entries.

## $\Sigma_c(2520)$ WIDTHS

### $\Sigma_c(2520)^{++}$ WIDTH

<u>VALUE (MeV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$17.9^{+3.8}_{-3.2} \pm 4.0$	677	BRANDENB... 97	CLE2	$e^+ e^- \approx \Upsilon(4S)$

### $\Sigma_c(2520)^+$ WIDTH

<u>VALUE (MeV)</u>	<u>CL%</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<17	90	327	AMMAR	01 CLE2	$e^+ e^- \approx \Upsilon(4S)$

### $\Sigma_c(2520)^0$ WIDTH

<u>VALUE (MeV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
$13.0^{+3.7}_{-3.0} \pm 4.0$	504	BRANDENB... 97	CLE2	$e^+ e^- \approx \Upsilon(4S)$

## $\Sigma_c(2520)$ DECAY MODES

$\Lambda_c^+ \pi$  is the only strong decay allowed to a  $\Sigma_c$  having this mass.

Mode	Fraction ( $\Gamma_i/\Gamma$ )
$\Gamma_1 \quad \Lambda_c^+ \pi$	$\approx 100 \%$

## $\Sigma_c(2520)$ REFERENCES

AMMAR	01	PRL 86 1167	R. Ammar <i>et al.</i>	(CLEO Collab.)
BRANDENB...	97	PRL 78 2304	G. Brandenburg <i>et al.</i>	(CLEO Collab.)
AMMOISOV	93	JETPL 58 247	V.V. Ammosov <i>et al.</i>	(SERP)
		Translated from ZETFP 58 241.		