

$\Sigma_c(2520)$ $I(J^P) = 1(\frac{3}{2}^+)$ 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
2519.4 ± 1.5 OUR FIT				

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

2530 ± 5 ± 5	6	¹ AMMOSOV	93	HLBC $\nu p \rightarrow \mu^- \Sigma_c(2530)^{++}$
--------------	---	----------------------	----	--

¹ AMMOSOV 93 sees a cluster of 6 events and estimates the background to be 1 event.

 $\Sigma_c(2520)^+$ MASS

VALUE (MeV)	DOCUMENT ID
2515.9 ± 2.4 OUR FIT	

 $\Sigma_c(2520)^0$ MASS

VALUE (MeV)	DOCUMENT ID
2517.5 ± 1.4 OUR FIT	

 $\Sigma_c(2520)$ MASS DIFFERENCES **$m_{\Sigma_c(2520)^{++}} - m_{\Lambda_c^+}$**

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

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

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

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

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

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

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

² 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 Σ_c having this mass.

Mode	Fraction (Γ_i/Γ)
$\Gamma_1 \Lambda_c^+ \pi$	$\approx 100\%$

$\Sigma_c(2520)$ 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.		