

$\Xi_c(2790)$

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

Seen in $\Xi_c' \pi$ decays. The simplest assignment, based on the mass, width, and decay mode, is that this belongs in the same SU(4) multiplet as the $\Lambda(1405)$ and the $\Lambda_c(2595)^+$, but the spin and parity have not been measured.

 $\Xi_c(2790)$ MASSES

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

 $\Xi_c(2790)^+$ MASS

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>
2791.9 ± 0.5 OUR FIT	

 $\Xi_c(2790)^0$ MASS

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>
2793.9 ± 0.5 OUR FIT	

 $\Xi_c(2790) - \Xi_c'$ MASS DIFFERENCES **$m_{\Xi_c(2790)^+} - m_{\Xi_c^0}$**

<u>VALUE (MeV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
213.20 ± 0.22 OUR FIT				
213.2 ± 0.2 ± 0.1		YELTON	16	BELL 2231 and 11,560 evts
• • • We do not use the following data for averages, fits, limits, etc. • • •				
211.2 ± 1.3 ± 1.0	18	CSORNA	01	CLEO $e^+e^- \approx \Upsilon(4S)$

 $m_{\Xi_c(2790)^0} - m_{\Xi_c^{'+}}$

<u>VALUE (MeV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
215.70 ± 0.22 OUR FIT				
215.7 ± 0.2 ± 0.1		YELTON	16	BELL 1241 and 7055 evts
• • • We do not use the following data for averages, fits, limits, etc. • • •				
216.2 ± 1.3 ± 1.0	14	CSORNA	01	CLEO $e^+e^- \approx \Upsilon(4S)$

 $\Xi_c(2790)^+ - \Xi_c(2790)^0$ MASS DIFFERENCE

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
-2.0 ± 0.7 OUR FIT			
• • • We do not use the following data for averages, fits, limits, etc. • • •			
-3.3 ± 0.4 ± 0.5	YELTON	16	BELL 2231 and 1241 evts

$\Xi_c(2790)$ WIDTHS $\Xi_c(2790)^+$ WIDTH

VALUE (MeV)	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$8.9 \pm 0.6 \pm 0.8$		2231	YELTON	16	BELL e^+e^- , Υ regions
<15	90		CSORNA	01	CLEO $e^+e^- \approx \Upsilon(4S)$

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

 $\Xi_c(2790)^0$ WIDTH

VALUE (MeV)	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
$10.0 \pm 0.7 \pm 0.8$		1241	YELTON	16	BELL e^+e^- , Υ regions
<12	90		CSORNA	01	CLEO $e^+e^- \approx \Upsilon(4S)$

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

 $\Xi_c(2790)$ DECAY MODES

Mode	Fraction (Γ_i/Γ)
$\Gamma_1 \quad \Xi_c' \pi$	seen
$\Gamma_2 \quad \Xi_c^0 \gamma$	
$\Gamma_3 \quad \Xi_c^+ \gamma$	
$\Gamma_4 \quad \Lambda_c^+ K^-$	seen

 $\Xi_c(2790)$ BRANCHING RATIOS

$\Gamma(\Xi_c' \pi)/\Gamma_{\text{total}}$	Γ_1/Γ		
VALUE	DOCUMENT ID	TECN	COMMENT
seen	YELTON	16	BELL e^+e^- , Υ regions
seen	CSORNA	01	CLEO $e^+e^- \approx \Upsilon(4S)$

$\Gamma(\Xi_c^0 \gamma)/\Gamma(\Xi_c' \pi)$	Γ_2/Γ_1				
VALUE	EVTS	DOCUMENT ID	TECN	CHG	COMMENT
$0.13 \pm 0.03 \pm 0.02$	401	¹ YELTON	20	BELL	0 e^+e^- at $\Upsilon(4S)$

¹ Assumes $B(\Xi_c'^+ \rightarrow \Xi_c^+ \gamma) = 100\%$, noting no strong decay of the Ξ_c' is permitted in the available phase space. YELTON 20 measures $B(\Xi_c(2790)^0 \rightarrow \Xi_c^0 \gamma)/B(\Xi_c(2790)^0 \rightarrow \Xi_c'^+ \pi^- \rightarrow \Xi_c^+ \gamma \pi^-)$.

$\Gamma(\Xi_c^+ \gamma)/\Gamma(\Xi_c' \pi)$	Γ_3/Γ_1				
VALUE	CL%	DOCUMENT ID	TECN	CHG	COMMENT
<0.06	90	¹ YELTON	20	BELL	+ e^+e^- at $\Upsilon(4S)$

¹ Assumes $B(\Xi_c'^0 \rightarrow \Xi_c^0 \gamma) = 100\%$, noting no strong decay of the Ξ_c' is permitted in the available phase space. YELTON 20 measures $B(\Xi_c(2790)^+ \rightarrow \Xi_c^+ \gamma)/B(\Xi_c(2790)^+ \rightarrow \Xi_c'^0 \pi^+ \rightarrow \Xi_c^0 \gamma \pi^+)$.

$\Gamma(\Lambda_c^+ K^-)/\Gamma_{\text{total}}$					Γ_4/Γ
<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
seen	1.5k	¹ AAIJ	23X LHCb	$B^- \rightarrow \Lambda_c^+ \bar{\Lambda}_c^- K^-$	
¹ AAIJ 23X observes this decay mode at 3.7σ significance from a study of the $\Lambda_c^+ K^-$ system within $B^- \rightarrow \Lambda_c^+ \bar{\Lambda}_c^- K^-$ decays.					

$\Xi_c(2790)$ REFERENCES

AAIJ	23X	PR D108 012020	R. Aaij <i>et al.</i>	(LHCb Collab.)
YELTON	20	PR D102 071103	J. Yelton <i>et al.</i>	(BELLE Collab.)
YELTON	16	PR D94 052011	J. Yelton <i>et al.</i>	(BELLE Collab.)
CSORNA	01	PRL 86 4243	S.E. Csorna <i>et al.</i>	(CLEO Collab.)