$\Xi_c(2790)$

$I(J^P) = \frac{1}{2}(\frac{1}{2}^-)$ 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

VALUE (MeV)	*DOCUMENT ID*
2791.9±0.5 OUR FIT	

$\Xi_c(2790)^0$ MASS

VALUE (MeV)	*DOCUMENT ID*
2793.9±0.5 OUR FIT	

$\Xi_c(2790) - \Xi_c'$ MASS DIFFERENCES

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

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
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	$e^+e^- \approx \Upsilon(4S)$

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

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
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

VALUE (MeV)	*DOCUMENT ID*	*TECN*	*COMMENT*
−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±0.6±0.8		2231	YELTON	16	BELL	e^+e^-, Υ regions
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<15	90		CSORNA	01	CLEO	$e^+e^- \approx \Upsilon(4S)$

$\Xi_c(2790)^0$ WIDTH

VALUE (MeV)	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
10.0±0.7±0.8		1241	YELTON	16	BELL	e^+e^-, Υ regions
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<12	90		CSORNA	01	CLEO	$e^+e^- \approx \Upsilon(4S)$

$\Xi_c(2790)$ DECAY MODES

	Mode	Fraction (Γ_i/Γ)
Γ_1	$\Xi_c'\pi$	seen
Γ_2	$\Xi_c^0\gamma$	
Γ_3	$\Xi_c^+\gamma$	
Γ_4	$\Lambda_c^+K^-$	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±0.03±0.02	401	[1] YELTON	20	BELL	0	e^+e^- at $\Upsilon(4S)$

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

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

$\Gamma(\Lambda_c^+K^-)/\Gamma_{\text{total}}$ Γ_4/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
seen	1.5k	[1] AAIJ	23X	LHCB	$B^- \to \Lambda_c^+\overline{\Lambda}_c^-K^-$

[1] AAIJ 23X observes this decay mode at 3.7σ significance from a study of the $\Lambda_c^+ K^-$ system within $B^- \to \Lambda_c^+ \overline{\Lambda}_c^- K^-$ decays.

$\Xi_c(2790)$ REFERENCES

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