NODE=B149

$\Xi_c(2790)$

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

NODE=B149

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

NODE=B149205

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

NODE=B149205

$\Xi_c(2790)^+$ MASS

NODE=B149M+
NODE=B149M+

VALUE (MeV)	DOCUMENT ID
2792.0±0.5 OUR FIT	
[2791.9 ± 0.5 MeV OUR 2025 FIT]	

NEW

$\Xi_c(2790)^0$ MASS

NODE=B149M0
NODE=B149M0

VALUE (MeV)	DOCUMENT ID
2794.0±0.5 OUR FIT	
[2793.9 ± 0.5 MeV OUR 2025 FIT]	

NEW

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

NODE=B149209

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

NODE=B149DP+
NODE=B149DP+

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	$e^+ e^- \approx \Upsilon(4S)$

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

NODE=B149DP0
NODE=B149DP0

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

NODE=B149D+0

NODE=B149D+0

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

NODE=B149210

$\Xi_c(2790)^+$ WIDTH

NODE=B149W+
NODE=B149W+

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

NODE=B149W0
NODE=B149W0

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

NODE=B149215;NODE=B149

	Mode	Fraction (Γ_i/Γ)	
Γ_1	$\Xi'_c \pi$	seen	DESIG=1
Γ_2	$\Xi^0_c \gamma$		DESIG=3
Γ_3	$\Xi^+_c \gamma$		DESIG=4
Γ_4	$\Lambda^+_c K^-$	seen	DESIG=5

$\Xi_c(2790)$ BRANCHING RATIOS

NODE=B149225

$\Gamma(\Xi'_c \pi)/\Gamma_{total}$ — Γ_1/Γ

NODE=B149R01
NODE=B149R01

VALUE	DOCUMENT ID		TECN	COMMENT
seen	YELTON	16	BELL	$e^+ e^-$, Υ regions
seen	CSORNA	01	CLEO	$e^+ e^- \approx \Upsilon(4S)$

$\Gamma(\Xi^0_c \gamma)/\Gamma(\Xi'_c \pi)$ — Γ_2/Γ_1

NODE=B149R00
NODE=B149R00

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($\Xi_c(2790)^0 \to \Xi^0_c \gamma$)/B($\Xi_c(2790)^0 \to \Xi'^+_c \pi^- \to \Xi^+_c \gamma \pi^-$).

NODE=B149R00;LINKAGE=A

$\Gamma(\Xi^+_c \gamma)/\Gamma(\Xi'_c \pi)$ — Γ_3/Γ_1

NODE=B149R02
NODE=B149R02

VALUE	CL%	DOCUMENT ID		TECN	CHG	COMMENT
<0.06	90	[1] YELTON	20	BELL	+	$e^+ e^-$ at $\Upsilon(4S)$

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

NODE=B149R02;LINKAGE=A

$\Gamma(\Lambda^+_c K^-)/\Gamma_{total}$ — Γ_4/Γ

NODE=B149R03
NODE=B149R03

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.

NODE=B149R03;LINKAGE=A

$\Xi_c(2790)$ REFERENCES

NODE=B149

AAIJ	23X	PR D108 012020	R. Aaij *et al.*	(LHCb Collab.)	REFID=62300
YELTON	20	PR D102 071103	J. Yelton *et al.*	(BELLE Collab.)	REFID=60725
YELTON	16	PR D94 052011	J. Yelton *et al.*	(BELLE Collab.)	REFID=57432
CSORNA	01	PRL 86 4243	S.E. Csorna *et al.*	(CLEO Collab.)	REFID=48122