NODE=B148

$\Xi_c(2815)$

$I(J^P) = \frac{1}{2}(\frac{3}{2}^-)$ Status: ∗∗∗

NODE=B148

Seen in both $\Xi'_c\pi$ and $\Xi_c\pi\pi$ decays. The simplest assignment is that this belongs to the same SU(4) multiplet as the $\Lambda(1520)$ and the $\Lambda_c(2625)$, but the spin and parity have not been measured.

$\Xi_c(2815)$ MASSES

NODE=B148205

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

NODE=B148205

$\Xi_c(2815)^+$ MASS

NODE=B148M+
NODE=B148M+

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
2816.60±0.16 OUR FIT					
[2816.51 ± 0.25 MeV OUR 2025 FIT Scale factor = 1.2]					
2816.65±0.23 OUR AVERAGE [2817.0 ± 1.4 MeV OUR 2016 AVERAGE]					
2816.65±0.03±0.03±0.23	4.1k	[1] AAIJ	25AI	LHCB	pp at 13 TeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
2817.0 ±1.2 $^{+0.7}_{-0.8}$	73	LESIAK	08	BELL	$e^+e^- \approx \Upsilon(4S)$

NEW
NEW
SYCLP2=F
SYCLP2=F

[1] The third uncertainty is due to the Ξ_c^+ mass.

NODE=B148M+;LINKAGE=A

$\Xi_c(2815)^0$ MASS

NODE=B148M0
NODE=B148M0

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
2819.85±0.27 OUR FIT Error includes scale factor of 1.1. [2819.79 ± 0.30 MeV OUR 2025 FIT Scale factor = 1.1]					
• • • We do not use the following data for averages, fits, limits, etc. • • •					
2820.4 ±1.4 $^{+0.9}_{-1.0}$	48 ± 8	LESIAK	08	BELL	$e^+e^- \approx \Upsilon(4S)$

NEW
SYCLP2=F

$\Xi_c(2815) - \Xi_c$ MASS DIFFERENCES

NODE=B148207

$m_{\Xi_c(2815)^+} - m_{\Xi_c^+}$

NODE=B148D+
NODE=B148D+

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
348.81±0.09 OUR FIT					
[348.80 ± 0.10 MeV OUR 2025 FIT]					
348.80±0.08±0.06	941	YELTON	16	BELL	e^+e^-, Υ regions
• • • We do not use the following data for averages, fits, limits, etc. • • •					
348.6 ±0.6 ±1.0	20	ALEXANDER	99B	CLE2	$e^+e^- \approx \Upsilon(4S)$

NEW

$m_{\Xi_c(2815)^0} - m_{\Xi_c^0}$

NODE=B148D0
NODE=B148D0

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
349.35±0.11 OUR FIT					
349.35±0.08±0.07	1258	YELTON	16	BELL	e^+e^-, Υ regions
• • • We do not use the following data for averages, fits, limits, etc. • • •					
347.2 ±0.7 ±2.0	9	ALEXANDER	99B	CLE2	$e^+e^- \approx \Upsilon(4S)$

$\Xi_c(2815)^+ - \Xi_c(2815)^0$ MASS DIFFERENCE

NODE=B148208

$m_{\Xi_c(2815)^+} - m_{\Xi_c(2815)^0}$

NODE=B148DD
NODE=B148DD

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
−3.26±0.27 OUR FIT				
[−3.27 ± 0.27 MeV OUR 2025 FIT]				
• • • We do not use the following data for averages, fits, limits, etc. • • •				
−3.47±0.12±0.48	YELTON	16	BELL	941 and 1258 evts
−3.4 ±1.9 ±0.9	LESIAK	08	BELL	73 & 48 events

NEW
SYCLP2=F

$\Xi_c(2815)$ WIDTHS

NODE=B148210

$\Xi_c(2815)^+$ WIDTH

NODE=B148W+
NODE=B148W+

VALUE (MeV)	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
2.15±0.15 OUR AVERAGE Error includes scale factor of 1.2. [2.43 ± 0.26 MeV OUR 2025 AVERAGE]						
2.07±0.08±0.12		4.1k	AAIJ	25AI	LHCB	pp at 13 TeV
2.43±0.20±0.17		941	YELTON	16	BELL	e^+e^-, Υ regions
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<3.5	90		ALEXANDER	99B	CLE2	$e^+e^- \approx \Upsilon(4S)$

NEW

$\Xi_c(2815)^0$ WIDTH

NODE=B148W0
NODE=B148W0

VALUE (MeV)	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
2.54±0.18±0.17		1258	YELTON	16	BELL	e^+e^-, Υ regions
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<6.5	90		ALEXANDER	99B	CLE2	$e^+e^- \approx \Upsilon(4S)$

$\Xi_c(2815)$ DECAY MODES

NODE=B148215;NODE=B148

The $\Xi_c\pi\pi$ modes are consistent with being entirely via $\Xi_c(2645)\pi$.

NODE=B148

	Mode	Fraction (Γ_i/Γ)	
Γ_1	$\Xi'_c\pi$	seen	DESIG=3
Γ_2	$\Xi_c(2645)\pi$	seen	DESIG=5
Γ_3	$\Xi_c^+\pi^+\pi^-$	seen	DESIG=8
Γ_4	$\Xi_c^0\gamma$	seen	DESIG=6;OUR EVAL
Γ_5	$\Xi_c^+\gamma$		DESIG=7

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

NODE=B148R01
NODE=B148R01

VALUE	DOCUMENT ID		TECN	COMMENT
seen	YELTON	16	BELL	e^+e^-, Υ regions
seen	ALEXANDER	99B	CLE2	$e^+e^- \approx \Upsilon(4S)$

$\Gamma(\Xi_c(2645)\pi)/\Gamma_{total}$ — Γ_2/Γ

NODE=B148R03
NODE=B148R03

VALUE	DOCUMENT ID		TECN	COMMENT
seen	YELTON	16	BELL	e^+e^-, Υ regions
seen	LESIAK	08	BELL	$e^+e^- \approx \Upsilon(4S)$

$\Gamma(\Xi_c^+\pi^+\pi^-)/\Gamma_{total}$ — Γ_3/Γ

NODE=B148R05
NODE=B148R05

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
seen	4.1k	AAIJ	25AI	LHCB	pp at 13 TeV

$\Gamma(\Xi_c^0\gamma)/\Gamma(\Xi_c(2645)\pi)$ — Γ_4/Γ_2

NODE=B148R00
NODE=B148R00

VALUE	EVTS	DOCUMENT ID		TECN	CHG	COMMENT
0.41±0.05±0.03	222	[1] YELTON	20	BELL	0	e^+e^- at $\Upsilon(4S)$

[1] Assumes B($\Xi_c(2645)^+ \rightarrow \Xi_c^0\pi^+$) = 100%, which is the only strong decay of the $\Xi_c(2645)$ permitted in the available phase space. YELTON 20 measures B($\Xi_c(2815)^0 \rightarrow \Xi_c^0\gamma$)/B($\Xi_c(2815)^0 \rightarrow \Xi_c(2645)^+\pi^- \rightarrow \Xi_c^0\pi^+\pi^-$).

NODE=B148R00;LINKAGE=A

$\Gamma(\Xi_c^+\gamma)/\Gamma(\Xi_c(2645)\pi)$ — Γ_5/Γ_2

NODE=B148R04
NODE=B148R04

VALUE	CL%	DOCUMENT ID		TECN	CHG	COMMENT
<0.09	90	[1] YELTON	20	BELL	+	e^+e^- at $\Upsilon(4S)$

[1] Assumes B($\Xi_c(2645)^0 \rightarrow \Xi_c^+\pi^-$) = 100%, which is the only strong decay of the $\Xi_c(2645)$ permitted in the available phase space. YELTON 20 measures B($\Xi_c(2815)^+ \rightarrow \Xi_c^+\gamma$)/B($\Xi_c(2815)^+ \rightarrow \Xi_c(2645)^0\pi^+ \rightarrow \Xi_c^+\pi^-\pi^+$).

NODE=B148R04;LINKAGE=A

$\Xi_c(2815)$ REFERENCES

NODE=B148

AAIJ	25AI	PRL 135 161901	R. Aaij *et al.*	(LHCb Collab.)	REFID=63651
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
LESIAK	08	PL B665 9	T. Lesiak *et al.*	(BELLE Collab.)	REFID=52460
ALEXANDER	99B	PRL 83 3390	J.P. Alexander *et al.*	(CLEO Collab.)	REFID=47184