$\Xi_c(2815)$

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

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

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

$\Xi_c(2815)^+$ MASS

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
2816.51±0.25 OUR FIT	Error includes scale factor of 1.2.				
• • • We do not use the following data for averages, fits, limits, etc. • • •					
2817.0 ± 1.2 $^{+0.7}_{-0.8}$	73 ± 10	LESIAK	08	BELL	$e^+e^- \approx \Upsilon(4S)$

$\Xi_c(2815)^0$ MASS

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
2819.79±0.30 OUR FIT	Error includes scale factor of 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	$e^+e^- \approx \Upsilon(4S)$

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

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

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
348.80±0.10 OUR 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	$e^+e^- \approx \Upsilon(4S)$

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

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

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

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
−3.27±0.27 OUR FIT				
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$-3.47\pm0.12\pm0.48$	YELTON	16	BELL	941 and 1258 evts
-3.4 ± 1.9 ± 0.9	LESIAK	08	BELL	73 & 48 events

$\Xi_c(2815)$ WIDTHS

$\Xi_c(2815)^+$ WIDTH

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

$\Xi_c(2815)^0$ WIDTH

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

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

	Mode	Fraction (Γ_i/Γ)
Γ_1	$\Xi_c'\pi$	seen
Γ_2	$\Xi_c(2645)\pi$	seen
Γ_3	$\Xi_c^0\gamma$	seen
Γ_4	$\Xi_c^+\gamma$	

$\Gamma(\Xi_c'\pi)/\Gamma_{\text{total}}$ Γ_1/Γ

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

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

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

$\Gamma(\Xi_c^0\gamma)/\Gamma(\Xi_c(2645)\pi)$ Γ_3/Γ_2

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

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

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 $B(\Xi_c(2815)^+ \rightarrow \Xi_c^+\gamma)/B(\Xi_c(2815)^+ \rightarrow \Xi_c(2645)^0\pi^+ \rightarrow \Xi_c^+\pi^-\pi^+)$.

$\Xi_c(2815)$ REFERENCES

YELTON	20	PR D102 071103	J. Yelton *et al.*	(BELLE Collab.)
YELTON	16	PR D94 052011	J. Yelton *et al.*	(BELLE Collab.)
LESIAK	08	PL B665 9	T. Lesiak *et al.*	(BELLE Collab.)
ALEXANDER	99B	PRL 83 3390	J.P. Alexander *et al.*	(CLEO Collab.)