# $\Xi_c(2645)$

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

The natural assignment is that this is the $J^P = 3/2^+$ excitation of the $\Xi_c$ in the same SU(4) multiplet as the $\Delta(1232)$, but the quantum numbers have not been measured.

## $\Xi_c(2645)$ MASSES

### $\Xi_c(2645)^+$ MASS

| *VALUE* (MeV) | *EVTS* | *DOCUMENT ID* | | *TECN* | *COMMENT* |
|---|---|---|---|---|---|
| **$2645.56^{+0.24}_{-0.30}$ OUR FIT** | | | | | |
| **$2645.6 \pm 0.2\ ^{+0.6}_{-0.8}$** | $578 \pm 32$ | LESIAK | 08 | BELL | $e^+e^- \approx \Upsilon(4S)$ |

### $\Xi_c(2645)^0$ MASS

| *VALUE* (MeV) | *EVTS* | *DOCUMENT ID* | | *TECN* | *COMMENT* |
|---|---|---|---|---|---|
| **$2646.38^{+0.20}_{-0.23}$ OUR FIT** Error includes scale factor of 1.1. | | | | | |
| **$2645.7 \pm 0.2\ ^{+0.6}_{-0.7}$** | $611 \pm 32$ | LESIAK | 08 | BELL | $e^+e^- \approx \Upsilon(4S)$ |

## $\Xi_c(2645) - \Xi_c$ MASS DIFFERENCES

### $m_{\Xi_c(2645)^+} - m_{\Xi_c^0}$

| *VALUE* (MeV) | *EVTS* | *DOCUMENT ID* | | *TECN* | *COMMENT* |
|---|---|---|---|---|---|
| **$174.66 \pm 0.09$ OUR FIT** | | | | | |
| **$174.66 \pm 0.06 \pm 0.07$** | 1260 | YELTON | 16 | BELL | $e^+e^-$ in $\Upsilon$ regions |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | |
| $177.1 \pm 0.5 \pm 1.1$ | 47 | FRABETTI | 98B | E687 | $\gamma$ Be, $\overline{E}_\gamma = 220$ GeV |
| $174.3 \pm 0.5 \pm 1.0$ | 34 | GIBBONS | 96 | CLE2 | $e^+e^- \approx \Upsilon(4S)$ |

### $m_{\Xi_c(2645)^0} - m_{\Xi_c^+}$

| *VALUE* (MeV) | *EVTS* | *DOCUMENT ID* | | *TECN* | *COMMENT* |
|---|---|---|---|---|---|
| **$178.44 \pm 0.10$ OUR FIT** | | | | | |
| **$178.46 \pm 0.07 \pm 0.07$** | 975 | YELTON | 16 | BELL | $e^+e^-$ in $\Upsilon$ regions |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | |
| $178.2 \pm 0.5 \pm 1.0$ | 55 | AVERY | 95 | CLE2 | $e^+e^- \approx \Upsilon(4S)$ |

## $\Xi_c(2645)^+ - \Xi_c(2645)^0$ MASS DIFFERENCE

| *VALUE* (MeV) | *DOCUMENT ID* | | *TECN* | *COMMENT* |
|---|---|---|---|---|
| **$-0.82 \pm 0.26$ OUR FIT** | | | | |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | |
| $-0.85 \pm 0.09 \pm 0.49$ | YELTON | 16 | BELL | 1260 and 975 evts |
| $-0.1 \pm 0.3 \pm 0.6$ | LESIAK | 08 | BELL | $\approx 600$ evts each |

## $\Xi_c(2645)$ WIDTHS

### $\Xi_c(2645)^+$ WIDTH

| *VALUE* (MeV) | *CL%* | *EVTS* | *DOCUMENT ID* | | *TECN* | *COMMENT* |
|---|---|---|---|---|---|---|
| **2.14±0.19 OUR AVERAGE** Error includes scale factor of 1.1. | | | | | | |
| 2.06±0.13±0.13 | | 1260 | YELTON | 16 | BELL | $e^+e^-$ in $\Upsilon$ regions |
| 2.6 ±0.2 ±0.4 | | 3.7k | KATO | 14 | BELL | $e^+e^-$ $\Upsilon(1S)$-$\Upsilon(5S)$ |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | | |
| <3.1 | 90 | | GIBBONS | 96 | CLE2 | $e^+e^- \approx \Upsilon(4S)$ |

### $\Xi_c(2645)^0$ WIDTH

| *VALUE* (MeV) | *CL%* | *EVTS* | *DOCUMENT ID* | | *TECN* | *COMMENT* |
|---|---|---|---|---|---|---|
| **2.35±0.18±0.13** | | 975 | YELTON | 16 | BELL | $e^+e^-$ in $\Upsilon$ regions |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | | |
| <5.5 | 90 | 55 | AVERY | 95 | CLE2 | $e^+e^- \approx \Upsilon(4S)$ |

## $\Xi_c(2645)$ DECAY MODES

$\Xi_c\,\pi$ is the only strong decay allowed to a $\Xi_c$ resonance having this mass.

| | Mode | Fraction ($\Gamma_i/\Gamma$) |
|---|---|---|
| $\Gamma_1$ | $\Xi_c^0\,\pi^+$ | seen |
| $\Gamma_2$ | $\Xi_c^+\,\pi^-$ | seen |

## $\Xi_c(2645)$ REFERENCES


| | | | | |
|---|---|---|---|---|
| YELTON | 16 | PR D94 052011 | J. Yelton *et al.* | (BELLE Collab.) |
| KATO | 14 | PR D89 052003 | Y. Kato *et al.* | (BELLE Collab.) |
| LESIAK | 08 | PL B665 9 | T. Lesiak *et al.* | (BELLE Collab.) |
| FRABETTI | 98B | PL B426 403 | P.L. Frabetti *et al.* | (FNAL E687 Collab.) |
| GIBBONS | 96 | PRL 77 810 | L.K. Gibbons *et al.* | (CLEO Collab.) |
| AVERY | 95 | PRL 75 4364 | P. Avery *et al.* | (CLEO Collab.) |