

$\Xi_c(2645)$

$I(J^P) = \frac{1}{2}(\frac{3}{2}^+)$  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                            |
|---------------------------------------------|-------------------------------------|-------------|------|------------------------------------|
| <b>2645.10±0.30 OUR FIT</b>                 | Error includes scale factor of 1.2. |             |      |                                    |
| 2645.6 ±0.2 <sup>+0.6</sup> <sub>-0.8</sub> | 578 ± 32                            | LESIAK      | 08   | BELL $e^+e^- \approx \Upsilon(4S)$ |

$\Xi_c(2645)^0$  MASS

| VALUE (MeV)                                 | EVTS                                | DOCUMENT ID | TECN | COMMENT                            |
|---------------------------------------------|-------------------------------------|-------------|------|------------------------------------|
| <b>2646.16±0.25 OUR FIT</b>                 | Error includes scale factor of 1.3. |             |      |                                    |
| 2645.7 ±0.2 <sup>+0.6</sup> <sub>-0.7</sub> | 611 ± 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                                           |
|-------------------------------------------------------------------------------|------|-------------|------|---------------------------------------------------|
| <b>174.67±0.09 OUR FIT</b>                                                    |      |             |      |                                                   |
| 174.66±0.06±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 ±0.5 ±1.1                                                               | 47   | FRABETTI    | 98B  | E687 $\gamma$ Be, $\overline{E}_\gamma = 220$ GeV |
| 174.3 ±0.5 ±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                             |
|-------------------------------------------------------------------------------|------|-------------|------|-------------------------------------|
| <b>178.45±0.10 OUR FIT</b>                                                    |      |             |      |                                     |
| 178.46±0.07±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 ±0.5 ±1.0                                                               | 55   | VERY        | 95   | CLE2 $e^+e^- \approx \Upsilon(4S)$  |

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

| VALUE (MeV)                                                                   | DOCUMENT ID | TECN | COMMENT                   |
|-------------------------------------------------------------------------------|-------------|------|---------------------------|
| <b>−1.06±0.27 OUR FIT</b> Error includes scale factor of 1.1.                 |             |      |                           |
| ● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ● |             |      |                           |
| −0.85±0.09±0.49                                                               | YELTON      | 16   | BELL    1260 and 975 evts |
| −0.1 ±0.3 ±0.6                                                                | LESIAK      | 08   | BELL    ≈ 600 evts each   |

$\Xi_c(2645)$  WIDTHS

$\Xi_c(2645)^+$  WIDTH

| VALUE (MeV)                                                                   | CL% | EVTS | DOCUMENT ID | TECN | COMMENT                                        |
|-------------------------------------------------------------------------------|-----|------|-------------|------|------------------------------------------------|
| <b>2.14±0.19 OUR AVERAGE</b> 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 $e^+e^- \Upsilon(1S)\text{-}\Upsilon(5S)$ |
| • • • 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                             |
|-------------------------------------------------------------------------------|-----|------|-------------|------|-------------------------------------|
| <b>2.35±0.18±0.13</b>                                                         |     |      |             |      |                                     |
|                                                                               |     | 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 <i>et al.</i>     | (BELLE Collab.)     |
| KATO     | 14  | PR D89 052003 | Y. Kato <i>et al.</i>       | (BELLE Collab.)     |
| LESIK    | 08  | PL B665 9     | T. Lesiak <i>et al.</i>     | (BELLE Collab.)     |
| FRABETTI | 98B | PL B426 403   | P.L. Frabetti <i>et al.</i> | (FNAL E687 Collab.) |
| GIBBONS  | 96  | PRL 77 810    | L.K. Gibbons <i>et al.</i>  | (CLEO Collab.)      |
| AVERY    | 95  | PRL 75 4364   | P. Avery <i>et al.</i>      | (CLEO Collab.)      |