# $\Xi_c(2790)$

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

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

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

### $\Xi_c(2790)^+$ MASS

| *VALUE* (MeV) | *DOCUMENT ID* |
|---|---|
| **2791.9±0.5 OUR FIT** | |

### $\Xi_c(2790)^0$ MASS

| *VALUE* (MeV) | *DOCUMENT ID* |
|---|---|
| **2793.9±0.5 OUR FIT** | |

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

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

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

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

| *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

| *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

### $\Xi_c(2790)^+$ WIDTH

| *VALUE* (MeV) | *CL%* | *EVTS* | *DOCUMENT ID* | | *TECN* | *COMMENT* |
|---|---|---|---|---|---|---|
| **8.9±0.6±0.8** | | 2231 | YELTON | 16 | BELL | $e^+e^-$, $\Upsilon$ 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

| *VALUE* (MeV) | *CL%* | *EVTS* | *DOCUMENT ID* | | *TECN* | *COMMENT* |
|---|---|---|---|---|---|---|
| **10.0±0.7±0.8** | | 1241 | YELTON | 16 | BELL | $e^+e^-$, $\Upsilon$ 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

| | Mode | Fraction ($\Gamma_i/\Gamma$) |
|---|---|---|
| $\Gamma_1$ | $\Xi_c'\pi$ | seen |
| $\Gamma_2$ | $\Xi_c^0\gamma$ | |
| $\Gamma_3$ | $\Xi_c^+\gamma$ | |

## $\Xi_c(2790)$ BRANCHING RATIOS

### $\Gamma(\Xi_c'\pi)/\Gamma_{\text{total}}$ $\Gamma_1/\Gamma$

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

### $\Gamma(\Xi_c^0\gamma)/\Gamma(\Xi_c'\pi)$ $\Gamma_2/\Gamma_1$

| *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 $\Xi_c'$ is permitted in the available phase space. YELTON 20 measures $B(\Xi_c(2790)^0 \to \Xi_c^0\gamma)/B(\Xi_c(2790)^0 \to \Xi_c'^+\pi^- \to \Xi_c^+\gamma\pi^-)$.

### $\Gamma(\Xi_c^+\gamma)/\Gamma(\Xi_c'\pi)$ $\Gamma_3/\Gamma_1$

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

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

## $\Xi_c(2790)$ REFERENCES


| | | | | |
|---|---|---|---|---|
| YELTON | 20 | PR D102 071103 | J. Yelton *et al.* | (BELLE Collab.) |
| YELTON | 16 | PR D94 052011 | J. Yelton *et al.* | (BELLE Collab.) |
| CSORNA | 01 | PRL 86 4243 | S.E. Csorna *et al.* | (CLEO Collab.) |