# $\Omega_c^0$

$I(J^P) = 0(\frac{1}{2}^+)$ Status: ***

The quantum numbers have not been measured, but are simply assigned in accord with the quark model, in which the $\Omega_c^0$ is the $ssc$ ground state.

## $\Omega_c^0$ MASS

| VALUE (MeV) | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| **2697.5± 2.6 OUR AVERAGE** | | Error includes scale factor of 1.2. | | | |
| 2694.6± 2.6±1.9 | 40 | [1] CRONIN-HEN..01 | | CLE2 | $e^+e^- \approx$ 10.6 GeV |
| 2699.9± 1.5±2.5 | 42 | [2] FRABETTI | 94H | E687 | $\gamma$ Be, $\overline{E}_\gamma$ = 221 GeV |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | |
| 2705.9± 3.3±2.0 | 10 | [3] FRABETTI | 93 | E687 | $\gamma$ Be, $\overline{E}_\gamma$ = 221 GeV |
| 2719.0± 7.0±2.5 | 11 | [4] ALBRECHT | 92H | ARG | $e^+e^- \approx$ 10.6 GeV |
| 2740 ±20 | 3 | BIAGI | 85B | SPEC | $\Sigma^-$ Be 135 GeV/$c$ |

[1] CRONIN-HENNESSY 01 sees 40.4 ± 9.0 events in a sum over five channels.
[2] FRABETTI 94H claims a signal of 42.5 ± 8.8 $\Sigma^+ K^- K^- \pi^+$ events. The background is about 24 events.
[3] FRABETTI 93 claims a signal of 10.3 ± 3.9 $\Omega^- \pi^+$ events above a background of 5.8 events.
[4] ALBRECHT 92H claims a signal of 11.5 ± 4.3 $\Xi^- K^- \pi^+ \pi^+$ events. The background is about 5 events.

## $\Omega_c^0$ MEAN LIFE

| VALUE ($10^{-15}$ s) | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| **69±12 OUR AVERAGE** | | | | | |
| 72±11±11 | 64 | LINK | 03C | FOCS | $\Omega^- \pi^+$, $\Xi^- K^- \pi^+ \pi^+$ |
| $55^{+13+18}_{-11-23}$ | 86 | ADAMOVICH | 95B | WA89 | $\Omega^- \pi^- \pi^+ \pi^+$, $\Xi^- K^- \pi^+ \pi^+$ |
| $86^{+27}_{-20}$±28 | 25 | FRABETTI | 95D | E687 | $\Sigma^+ K^- K^- \pi^+$ |

## $\Omega_c^0$ DECAY MODES

No absolute branching fractions have been measured.

| | Mode | Fraction ($\Gamma_i/\Gamma$) |
|---|---|---|
| $\Gamma_1$ | $\Sigma^+ K^- K^- \pi^+$ | seen |
| $\Gamma_2$ | $\Xi^0 K^- \pi^+$ | seen |
| $\Gamma_3$ | $\Xi^- K^- \pi^+ \pi^+$ | seen |
| $\Gamma_4$ | $\Omega^- e^+ \nu_e$ | seen |
| $\Gamma_5$ | $\Omega^- \pi^+$ | seen |
| $\Gamma_6$ | $\Omega^- \pi^+ \pi^0$ | seen |
| $\Gamma_7$ | $\Omega^- \pi^- \pi^+ \pi^+$ | seen |

## $\Omega_c^0$ BRANCHING RATIOS

### $\Gamma(\Sigma^+ K^- K^- \pi^+)/\Gamma_{total}$ $\Gamma_1/\Gamma$

| VALUE | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| **seen** | 42 | FRABETTI | 94H | E687 | $\gamma$ Be, $\overline{E}_\gamma = 221$ GeV |

### $\Gamma(\Sigma^+ K^- K^- \pi^+)/\Gamma(\Omega^- \pi^+)$ $\Gamma_1/\Gamma_5$

| VALUE | CL% | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | |
| $<4.8$ | 90 | CRONIN-HEN..01 | | CLE2 | $e^+e^- \approx 10.6$ GeV |

### $\Gamma(\Xi^0 K^- \pi^+)/\Gamma(\Omega^- \pi^+)$ $\Gamma_2/\Gamma_5$

| VALUE | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| **4.0±2.5±0.4** | 9 | CRONIN-HEN..01 | | CLE2 | $e^+e^- \approx 10.6$ GeV |

### $\Gamma(\Xi^- K^- \pi^+ \pi^+)/\Gamma_{total}$ $\Gamma_3/\Gamma$

| VALUE | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| **seen** | 11 | ALBRECHT | 92H | ARG | $e^+e^- \approx 10.6$ GeV |
| **seen** | 3 | BIAGI | 85B | SPEC | $\Sigma^-$ Be 135 GeV/$c$ |

### $\Gamma(\Xi^- K^- \pi^+ \pi^+)/\Gamma(\Omega^- \pi^+)$ $\Gamma_3/\Gamma_5$

| VALUE | CL% | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|---|
| **1.6±1.1±0.4** | | 7 | CRONIN-HEN..01 | | CLE2 | $e^+e^- \approx 10.6$ GeV |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | | |
| $<2.8$ | 90 | | FRABETTI | 93 | E687 | $\gamma$ Be, $\overline{E}_\gamma = 221$ GeV |

### $\Gamma(\Omega^- \pi^+)/\Gamma(\Omega^- e^+ \nu_e)$ $\Gamma_5/\Gamma_4$

| VALUE | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| **0.41±0.19±0.04** | 11 | AMMAR | 02 | CLE2 | $e^+e^- \approx \Upsilon(4S)$ |

### $\Gamma(\Omega^- \pi^+)/\Gamma_{total}$ $\Gamma_5/\Gamma$

| VALUE | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| **seen** | 13 | CRONIN-HEN..01 | | CLE2 | $e^+e^- \approx 10.6$ GeV |
| **seen** | 10 | FRABETTI | 93 | E687 | $\gamma$ Be, $\overline{E}_\gamma = 221$ GeV |

### $\Gamma(\Omega^- \pi^+ \pi^0)/\Gamma(\Omega^- \pi^+)$ $\Gamma_6/\Gamma_5$

| VALUE | EVTS | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| **4.2±2.2±0.9** | 12 | CRONIN-HEN..01 | | CLE2 | $e^+e^- \approx 10.6$ GeV |

### $\Gamma(\Omega^- \pi^- \pi^+ \pi^+)/\Gamma(\Omega^- \pi^+)$ $\Gamma_7/\Gamma_5$

| VALUE | CL% | DOCUMENT ID | | TECN | COMMENT |
|---|---|---|---|---|---|
| **seen** | | ADAMOVICH | 95B | WA89 | $\Sigma^-$ 340 GeV |
| • • • We do not use the following data for averages, fits, limits, etc. • • • | | | | | |
| $<0.56$ | 90 | CRONIN-HEN..01 | | CLE2 | $e^+e^- \approx 10.6$ GeV |
| $<1.6$ | 90 | FRABETTI | 93 | E687 | $\gamma$ Be, $\overline{E}_\gamma = 221$ GeV |

# $\Omega_c^0$ REFERENCES


| | | | | |
|---|---|---|---|---|
| LINK | 03C | PL B561 41 | J.M. Link *et al.* | (FNAL FOCUS Collab.) |
| AMMAR | 02 | PRL 89 171803 | R. Ammar *et al.* | (CLEO Collab.) |
| CRONIN-HEN... | 01 | PRL 86 3730 | D. Cronin-Hennessy *et al.* | (CLEO Collab.) |
| ADAMOVICH | 95B | PL B358 151 | M.I. Adamovich *et al.* | (CERN WA89 Collab.) |
| FRABETTI | 95D | PL B357 678 | P.L. Frabetti *et al.* | (FNAL E687 Collab.) |
| FRABETTI | 94H | PL B338 106 | P.L. Frabetti *et al.* | (FNAL E687 Collab.) |
| FRABETTI | 93 | PL B300 190 | P.L. Frabetti *et al.* | (FNAL E687 Collab.) |
| ALBRECHT | 92H | PL B288 367 | H. Albrecht *et al.* | (ARGUS Collab.) |
| BIAGI | 85B | ZPHY C28 175 | S.F. Biagi *et al.* | (CERN WA62 Collab.) |