



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

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. No absolute branching fractions have been measured.

### $\Omega_c^0$ MASS

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
<b>2695.2 ± 1.7 OUR FIT</b>	Error includes scale factor of 1.3.			
<b>2695.2<sup>+1.8</sup><sub>-1.6</sub> OUR AVERAGE</b>	Error includes scale factor of 1.3. See the ideogram below.			
2693.6 ± 0.3 <sup>+1.8</sup> <sub>-1.5</sub>	725	SOLOVIEVA 09	BELL	$\Omega^- \pi^+$ in $e^+ e^- \rightarrow \gamma(4S)$
2694.6 ± 2.6 ± 1.9	40	<sup>1</sup> CRONIN-HEN..01	CLE2	$e^+ e^- \approx 10.6$ GeV
2699.9 ± 1.5 ± 2.5	42	<sup>2</sup> FRABETTI 94H	E687	$\gamma$ Be, $\bar{E}_\gamma = 221$ GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •				
2705.9 ± 3.3 ± 2.0	10	<sup>3</sup> FRABETTI 93	E687	$\gamma$ Be, $\bar{E}_\gamma = 221$ GeV
2719.0 ± 7.0 ± 2.5	11	<sup>4</sup> ALBRECHT 92H	ARG	$e^+ e^- \approx 10.6$ GeV
2740 ± 20	3	BIAGI 85B	SPEC	$\Sigma^-$ Be 135 GeV/c

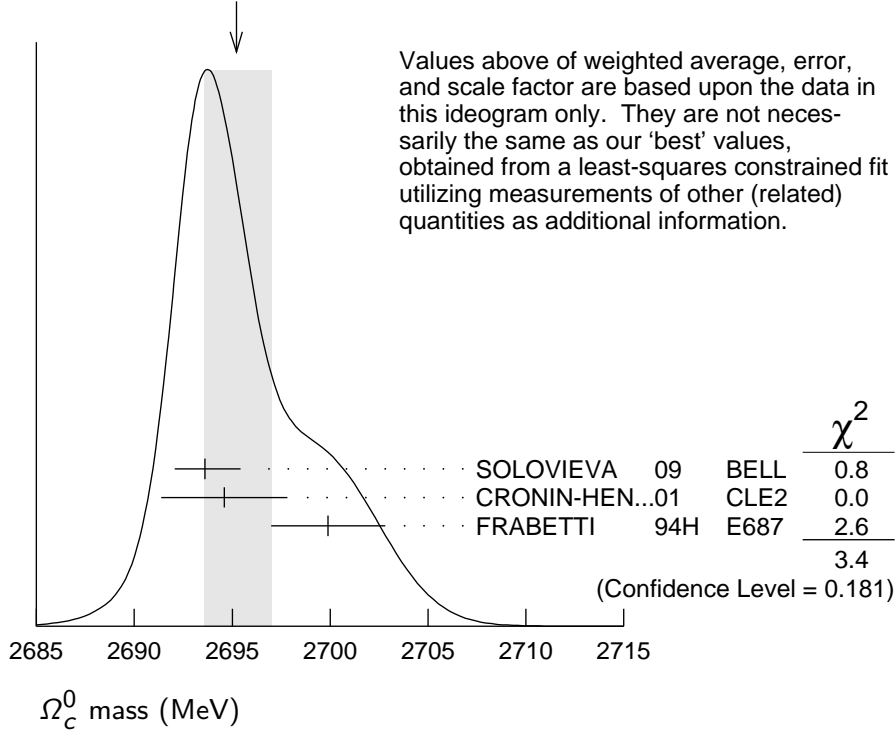
<sup>1</sup> CRONIN-HENNESSY 01 sees  $40.4 \pm 9.0$  events in a sum over five channels.

<sup>2</sup> FRABETTI 94H claims a signal of  $42.5 \pm 8.8 \Sigma^+ K^- K^- \pi^+$  events. The background is about 24 events.

<sup>3</sup> FRABETTI 93 claims a signal of  $10.3 \pm 3.9 \Omega^- \pi^+$  events above a background of 5.8 events.

<sup>4</sup> ALBRECHT 92H claims a signal of  $11.5 \pm 4.3 \Xi^- K^- \pi^+ \pi^+$  events. The background is about 5 events.

WEIGHTED AVERAGE  
 2695.2+1.8-1.6 (Error scaled by 1.3)



### $\Omega_c^0$ MEAN LIFE

VALUE ( $10^{-15}$ s)	EVTS	DOCUMENT ID	TECN	COMMENT
<b>268±24±10</b>	978	<sup>1</sup> AAIJ	18J LHCb	$pK^-K^-\pi^+$
•••				We do not use the following data for averages, fits, limits, etc. •••
72±11±11	64	LINK	03C FOCS	$\Omega^-\pi^+, \Xi^-K^-\pi^+\pi^+$
55 <sup>+13+18</sup> <sub>-11-23</sub>	86	ADAMOVICH	95B WA89	$\Omega^-\pi^-\pi^+\pi^+, \Xi^-K^-\pi^+\pi^+$
86 <sup>+27</sup> <sub>-20</sub> ±28	25	FRABETTI	95D E687	$\Sigma^+K^-K^-\pi^+$

<sup>1</sup>AAIJ 18J, with nearly five times more events than the previous three experiments combined, gets a lifetime that is nearly four times larger than the average of those experiments,  $(69 \pm 12) \times 10^{-15}$  s. We go with the larger data sample.

### $\Omega_c^0$ DECAY MODES

Mode	Fraction ( $\Gamma_j/\Gamma$ )	Confidence level
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**No absolute branching fractions have been measured.**  
**The following are branching *ratios* relative to  $\Omega^- \pi^+$ .**

**Cabibbo-favored ( $S = -3$ ) decays — relative to  $\Omega^- \pi^+$**

$\Gamma_i$	Decay Mode	Value	Percentage
$\Gamma_1$	$\Omega^- \pi^+$	<b>DEFINED AS 1</b>	
$\Gamma_2$	$\Omega^- \pi^+ \pi^0$	$1.80 \pm 0.33$	
$\Gamma_3$	$\Omega^- \rho^+$	$> 1.3$	90%
$\Gamma_4$	$\Omega^- \pi^- 2\pi^+$	$0.31 \pm 0.05$	
$\Gamma_5$	$\Omega^- e^+ \nu_e$	$2.4 \pm 1.2$	
$\Gamma_6$	$\Xi^0 \bar{K}^0$	$1.64 \pm 0.29$	
$\Gamma_7$	$\Xi^0 K^- \pi^+$	$1.20 \pm 0.18$	
$\Gamma_8$	$\Xi^0 \bar{K}^{*0}, \bar{K}^{*0} \rightarrow K^- \pi^+$	$0.68 \pm 0.16$	
$\Gamma_9$	$\Xi^- \bar{K}^0 \pi^+$	$2.12 \pm 0.28$	
$\Gamma_{10}$	$\Xi^- K^- 2\pi^+$	$0.63 \pm 0.09$	
$\Gamma_{11}$	$\Xi(1530)^0 K^- \pi^+, \Xi^{*0} \rightarrow$	$0.21 \pm 0.06$	
$\Gamma_{12}$	$\Xi^- \bar{K}^{*0} \pi^+$	$0.34 \pm 0.11$	
$\Gamma_{13}$	$\Sigma^+ K^- K^- \pi^+$	$< 0.32$	90%
$\Gamma_{14}$	$\Lambda \bar{K}^0 \bar{K}^0$	$1.72 \pm 0.35$	

**$\Omega_c^0$  BRANCHING RATIOS**

A few early but now obsolete measurements have been omitted. See K.A. Olive, *et al.* (Particle Data Group), Chinese Physics **C38** 070001 (2014).

**$\Gamma(\Omega^- \pi^+ \pi^0)/\Gamma(\Omega^- \pi^+)$   $\Gamma_2/\Gamma_1$**

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b><math>1.80 \pm 0.33</math> OUR AVERAGE</b>		Error includes scale factor of 1.9.		
$2.00 \pm 0.17 \pm 0.11$	403	YELTON	18	BELL $e^+ e^- \rightarrow \gamma(4S)$ , +higher
$1.27 \pm 0.31 \pm 0.11$	64	AUBERT	07AH BABR	$e^+ e^- \approx \gamma(4S)$

**$\Gamma(\Omega^- \rho^+)/\Gamma(\Omega^- \pi^+ \pi^0)$   $\Gamma_3/\Gamma_2$**

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b><math>&gt; 0.71</math></b>	90	<sup>1</sup> YELTON	18	BELL $e^+ e^- \rightarrow \gamma(4S)$ , +higher

<sup>1</sup>This submode fraction is evaluated from a background-subtracted signal in a mass plot. Result ignores interference effects and systematic uncertainties, which YELTON 18 claim are both small.

**$\Gamma(\Omega^- \pi^- 2\pi^+)/\Gamma(\Omega^- \pi^+)$   $\Gamma_4/\Gamma_1$**

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b><math>0.31 \pm 0.05</math> OUR AVERAGE</b>				
$0.32 \pm 0.05 \pm 0.02$	108	YELTON	18	BELL $e^+ e^- \rightarrow \gamma(4S)$ , +higher
$0.28 \pm 0.09 \pm 0.01$	25	AUBERT	07AH BABR	$e^+ e^- \approx \gamma(4S)$

**$\Gamma(\Omega^- \pi^+)/\Gamma(\Omega^- e^+ \nu_e)$   $\Gamma_1/\Gamma_5$**

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b><math>0.41 \pm 0.19 \pm 0.04</math></b>	11	AMMAR	02	CLE2 $e^+ e^- \approx \gamma(4S)$

$\Gamma(\Xi^0 \bar{K}^0)/\Gamma(\Omega^- \pi^+)$   $\Gamma_6/\Gamma_1$

<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>1.64±0.26±0.12</b>	98	YELTON	18	BELL $e^+ e^- \rightarrow \Upsilon(4S)$ , +higher

$\Gamma(\Xi^0 K^- \pi^+)/\Gamma(\Omega^- \pi^+)$   $\Gamma_7/\Gamma_1$

<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>1.20±0.16±0.08</b>	168	YELTON	18	BELL $e^+ e^- \rightarrow \Upsilon(4S)$ , +higher

$\Gamma(\Xi^0 \bar{K}^{*0}, \bar{K}^{*0} \rightarrow K^- \pi^+)/\Gamma(\Xi^0 K^- \pi^+)$   $\Gamma_8/\Gamma_7$

<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.57±0.10</b>	95	<sup>1</sup> YELTON	18	BELL $e^+ e^- \rightarrow \Upsilon(4S)$ , +higher

<sup>1</sup> This submode fraction is evaluated from a background-subtracted signal in a mass plot. Result ignores interference effects and systematic uncertainties, which YELTON 18 claim are both small.

$\Gamma(\Xi^- \bar{K}^0 \pi^+)/\Gamma(\Omega^- \pi^+)$   $\Gamma_9/\Gamma_1$

<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>2.12±0.24±0.14</b>	349	YELTON	18	BELL $e^+ e^- \rightarrow \Upsilon(4S)$ , +higher

$\Gamma(\Xi^- K^- 2\pi^+)/\Gamma(\Omega^- \pi^+)$   $\Gamma_{10}/\Gamma_1$

<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.63±0.09 OUR AVERAGE</b>		Error includes scale factor of 1.4.		
0.68±0.07±0.03	278	YELTON	18	BELL $e^+ e^- \rightarrow \Upsilon(4S)$ , +higher
0.46±0.13±0.03	45	AUBERT	07AH	BABR $e^+ e^- \approx \Upsilon(4S)$

$\Gamma(\Xi(1530)^0 K^- \pi^+, \Xi^{*0} \rightarrow \Xi^- \pi^+)/\Gamma(\Xi^- K^- 2\pi^+)$   $\Gamma_{11}/\Gamma_{10}$

<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.33±0.09</b>	74	<sup>1</sup> YELTON	18	BELL $e^+ e^- \rightarrow \Upsilon(4S)$ , +higher

<sup>1</sup> This submode fraction is evaluated from a background-subtracted signal in a mass plot. Result ignores interference effects and systematic uncertainties, which YELTON 18 claim are both small.

$\Gamma(\Xi^- \bar{K}^{*0} \pi^+)/\Gamma(\Xi^- K^- 2\pi^+)$   $\Gamma_{12}/\Gamma_{10}$

<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.55±0.16</b>	136	<sup>1</sup> YELTON	18	BELL $e^+ e^- \rightarrow \Upsilon(4S)$ , +higher

<sup>1</sup> This submode fraction is evaluated from a background-subtracted signal in a mass plot. Result ignores interference effects and systematic uncertainties, which YELTON 18 claim are both small.

$\Gamma(\Sigma^+ K^- K^- \pi^+)/\Gamma(\Omega^- \pi^+)$   $\Gamma_{13}/\Gamma_1$

<u>VALUE</u>	<u>CL%</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>&lt;0.32</b>	90	17	YELTON	18	BELL $e^+ e^- \rightarrow \Upsilon(4S)$ , +higher

$\Gamma(\Lambda \bar{K}^0 \bar{K}^0)/\Gamma(\Omega^- \pi^+)$   $\Gamma_{14}/\Gamma_1$

<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>1.72±0.32±0.14</b>	95	YELTON	18	BELL $e^+ e^- \rightarrow \Upsilon(4S)$ , +higher

## $\Omega_c^0$ REFERENCES

AAIJ	18J	PRL 121 092003	R. Aaij <i>et al.</i>	(LHCb Collab.)
YELTON	18	PR D97 032001	J. Yelton <i>et al.</i>	(BELLE Collab.)
PDG	14	CP C38 070001	K. Olive <i>et al.</i>	(PDG Collab.)
SOLOVIEVA	09	PL B672 1	E. Solovieva <i>et al.</i>	(BELLE Collab.)
AUBERT	07AH	PRL 99 062001	B. Aubert <i>et al.</i>	(BABAR Collab.)
LINK	03C	PL B561 41	J.M. Link <i>et al.</i>	(FNAL FOCUS Collab.)
AMMAR	02	PRL 89 171803	R. Ammar <i>et al.</i>	(CLEO Collab.)
CRONIN-HEN...	01	PRL 86 3730	D. Cronin-Hennessy <i>et al.</i>	(CLEO Collab.)
ADAMOVICH	95B	PL B358 151	M.I. Adamovich <i>et al.</i>	(CERN WA89 Collab.)
FRABETTI	95D	PL B357 678	P.L. Frabetti <i>et al.</i>	(FNAL E687 Collab.)
FRABETTI	94H	PL B338 106	P.L. Frabetti <i>et al.</i>	(FNAL E687 Collab.)
FRABETTI	93	PL B300 190	P.L. Frabetti <i>et al.</i>	(FNAL E687 Collab.)
ALBRECHT	92H	PL B288 367	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
BIAGI	85B	ZPHY C28 175	S.F. Biagi <i>et al.</i>	(CERN WA62 Collab.)

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