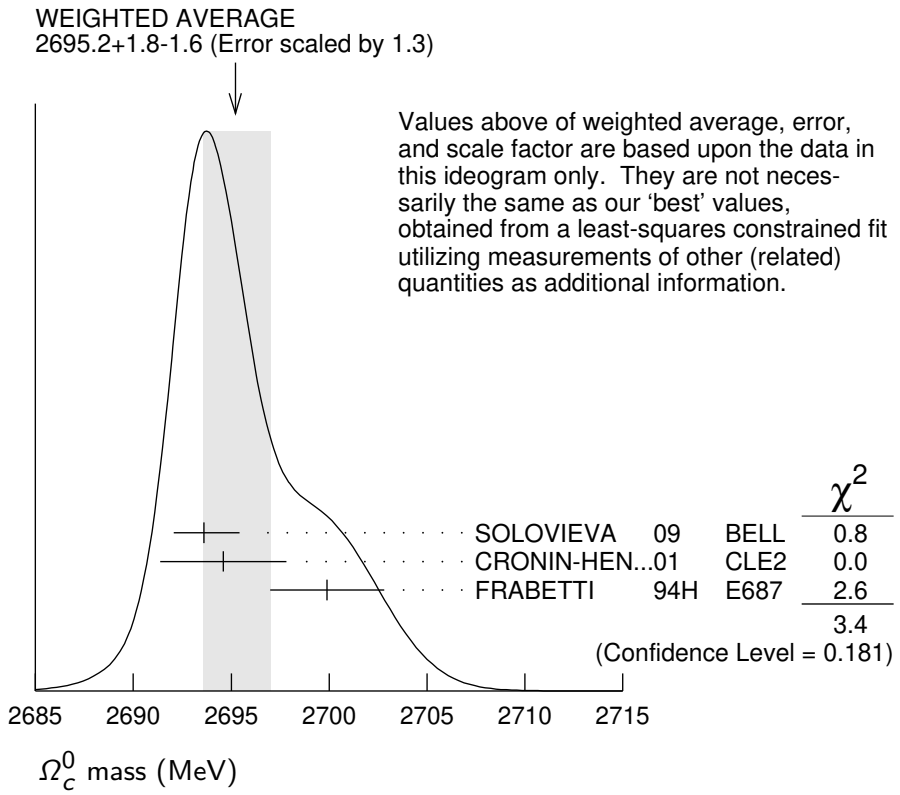
Ω_c^0

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

The quantum numbers have not been measured, but are simply assigned in accord with the quark model, in which the Ω_c^0 is the ssc ground state. No absolute branching fractions have been measured.

Ω_c^0 MASS

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
2695.2± 1.7 OUR FIT Error includes scale factor of 1.3.					
2695.2$^{+\ 1.8}_{-\ 1.6}$ OUR AVERAGE Error includes scale factor of 1.3. See the ideogram below.					
2693.6± 0.3$^{+1.8}_{-1.5}$	725	SOLOVIEVA	09	BELL	$\Omega^-\pi^+$ in $e^+e^- \to \Upsilon(4S)$
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	γBe, $\overline{E}_\gamma$= 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	γBe, $\overline{E}_\gamma$= 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	Σ^- 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.

Ω_c^0 MEAN LIFE

VALUE (10^{-15} s)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
268±24±10	978	[1] 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^{+13+18}_{-11-23}	86	ADAMOVICH	95B	WA89	$\Omega^-\pi^-\pi^+\pi^+$, $\Xi^-K^-\pi^+\pi^+$
$86^{+27}_{-20}\pm28$	25	FRABETTI	95D	E687	$\Sigma^+K^-K^-\pi^+$

[1] AAIJ 18J, with nearly five times more events that the previous three experiments combined, gets a lifetime that is nearly four times larger than the average of those experiments, (69 ± 12) × 10^{-15} s. We go with the larger data sample.

Ω_c^0 DECAY MODES

	Mode	Fraction (Γ_i/Γ)	Confidence level
	No absolute branching fractions have been measured. The following are branching *ratios* relative to $\Omega^-\pi^+$.		
	Cabibbo-favored ($S=-3$) decays — relative to $\Omega^-\pi^+$		
Γ_1	$\Omega^-\pi^+$	**DEFINED AS 1**	
Γ_2	$\Omega^-\pi^+\pi^0$	1.80±0.33	
Γ_3	$\Omega^-\rho^+$	>1.3	90%
Γ_4	$\Omega^-\pi^-2\pi^+$	0.31±0.05	
Γ_5	$\Omega^-e^+\nu_e$	2.4 ±1.2	
Γ_6	$\Xi^0\overline{K}^0$	1.64±0.29	
Γ_7	$\Xi^0K^-\pi^+$	1.20±0.18	
Γ_8	$\Xi^0\overline{K}^{*0}$, $\overline{K}^{*0}\to K^-\pi^+$	0.68±0.16	
Γ_9	$\Xi^-\overline{K}^0\pi^+$	2.12±0.28	
Γ_{10}	$\Xi^-K^-2\pi^+$	0.63±0.09	
Γ_{11}	$\Xi(1530)^0K^-\pi^+$, $\Xi^{*0}\to \Xi^-\pi^+$	0.21±0.06	
Γ_{12}	$\Xi^-\overline{K}^{*0}\pi^+$	0.34±0.11	
Γ_{13}	$pK^-K^-\pi^+$	seen	
Γ_{14}	$\Sigma^+K^-K^-\pi^+$	<0.32	90%
Γ_{15}	$\Lambda\overline{K}^0\overline{K}^0$	1.72±0.35	

Ω_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).

$\Gamma(\Omega^-\pi^+\pi^0)/\Gamma(\Omega^-\pi^+)$ Γ_2/Γ_1

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

$\Gamma(\Omega^-\rho^+)/\Gamma(\Omega^-\pi^+\pi^0)$ Γ_3/Γ_2

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
>0.71	90	[1] YELTON	18	BELL	$e^+e^- \to \Upsilon(4S)$, +higher

[1] 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.

$\Gamma(\Omega^-\pi^-2\pi^+)/\Gamma(\Omega^-\pi^+)$ Γ_4/Γ_1

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.31±0.05 OUR AVERAGE					
0.32±0.05±0.02	108	YELTON	18	BELL	$e^+e^- \to \Upsilon(4S)$, +higher
0.28±0.09±0.01	25	AUBERT	07AH	BABR	$e^+e^- \approx \Upsilon(4S)$

$\Gamma(\Omega^-\pi^+)/\Gamma(\Omega^-e^+\nu_e)$ Γ_1/Γ_5

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

$\Gamma(\Xi^0\overline{K}^0)/\Gamma(\Omega^-\pi^+)$ Γ_6/Γ_1

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
1.64±0.26±0.12	98	YELTON	18	BELL	$e^+e^- \to \Upsilon(4S)$, +higher

$\Gamma(\Xi^0K^-\pi^+)/\Gamma(\Omega^-\pi^+)$ Γ_7/Γ_1

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
1.20±0.16±0.08	168	YELTON	18	BELL	$e^+e^- \to \Upsilon(4S)$, +higher

$\Gamma(\Xi^0\overline{K}^{*0}, \overline{K}^{*0} \to K^-\pi^+)/\Gamma(\Xi^0K^-\pi^+)$ Γ_8/Γ_7

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.57±0.10	95	[1] YELTON	18	BELL	$e^+e^- \to \Upsilon(4S)$, +higher

[1] 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.

$\Gamma(\Xi^-\overline{K}^0\pi^+)/\Gamma(\Omega^-\pi^+)$ Γ_9/Γ_1

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
2.12±0.24±0.14	349	YELTON	18	BELL	$e^+e^- \to \Upsilon(4S)$, +higher

$\Gamma(\Xi^- K^- 2\pi^+)/\Gamma(\Omega^- \pi^+)$ Γ_{10}/Γ_1

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

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.33±0.09	74	[1] YELTON	18	BELL	$e^+e^- \to \Upsilon(4S)$, +higher

[1] 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.

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.55±0.16	136	[1] YELTON	18	BELL	$e^+e^- \to \Upsilon(4S)$, +higher

[1] 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.

$\Gamma(p K^- K^- \pi^+)/\Gamma_{\text{total}}$ Γ_{13}/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
seen	AAIJ	16O	LHCB	pp at 7, 8 TeV

$\Gamma(\Sigma^+ K^- K^- \pi^+)/\Gamma(\Omega^- \pi^+)$ Γ_{14}/Γ_1

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
<0.32	90	17	YELTON	18	BELL	$e^+e^- \to \Upsilon(4S)$, +higher

$\Gamma(\Lambda \overline{K}^0 \overline{K}^0)/\Gamma(\Omega^- \pi^+)$ Γ_{15}/Γ_1

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
1.72±0.32±0.14	95	YELTON	18	BELL	$e^+e^- \to \Upsilon(4S)$, +higher

Ω_c^0 REFERENCES

AAIJ	18J	PRL 121 092003	R. Aaij *et al.*	(LHCb Collab.)
YELTON	18	PR D97 032001	J. Yelton *et al.*	(BELLE Collab.)
AAIJ	16O	PR D93 092007	R. Aaij *et al.*	(LHCb Collab.)
PDG	14	CP C38 070001	K. Olive *et al.*	(PDG Collab.)
SOLOVIEVA	09	PL B672 1	E. Solovieva *et al.*	(BELLE Collab.)
AUBERT	07AH	PRL 99 062001	B. Aubert *et al.*	(BABAR Collab.)
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.)