



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

According to the quark model, the Ξ_c^0 (quark content dsc) and Ξ_c^+ form an isospin doublet, and the spin-parity ought to be $J^P = 1/2^+$. None of I , J , or P has actually been measured.

Ξ_c^0 MASS

The fit uses the Ξ_c^0 and Ξ_c^+ mass and mass-difference measurements.

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
2471.0 ± 0.4	OUR FIT			
2471.09^{+0.35}_{-1.00}	OUR AVERAGE			
2471.0 ± 0.3 ^{+0.2} _{-1.4}	8620 ± 355	¹ LESIAK	05 BELL	e^+e^- , $\Upsilon(4S)$
2470.0 ± 2.8 ± 2.6	85	FRABETTI	98B E687	γ Be, $\bar{E}_\gamma = 220$ GeV
2469 ± 2 ± 3	9	HENDERSON	92B CLEO	$\Omega^- K^+$
2472.1 ± 2.7 ± 1.6	54	ALBRECHT	90F ARG	e^+e^- at $\Upsilon(4S)$
2473.3 ± 1.9 ± 1.2	4	BARLAG	90 ACCM	$\pi^- (K^-)$ Cu 230 GeV
2472 ± 3 ± 4	19	ALAM	89 CLEO	e^+e^- 10.6 GeV
• • • We do not use the following data for averages, fits, limits, etc. • • •				
2462.1 ± 3.1 ± 1.4	42	² FRABETTI	93C E687	See FRABETTI 98B
2471 ± 3 ± 4	14	AVERY	89 CLEO	See ALAM 89

¹ The systematic error was (wrongly) given the other way round in LESIAK 05.

² The FRABETTI 93C mass is well below the other measurements.

$\Xi_c^0 - \Xi_c^+$ MASS DIFFERENCE

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
3.1 ± 0.5	OUR FIT		
3.1 ± 0.5	OUR AVERAGE		
+2.9 ± 0.5	LESIAK	05 BELL	e^+e^- , $\Upsilon(4S)$
+7.0 ± 4.5 ± 2.2	ALBRECHT	90F ARG	e^+e^- at $\Upsilon(4S)$
+6.8 ± 3.3 ± 0.5	BARLAG	90 ACCM	$\pi^- (K^-)$ Cu 230 GeV
+5 ± 4 ± 1	ALAM	89 CLEO	$\Xi_c^0 \rightarrow \Xi^- \pi^+$, $\Xi_c^+ \rightarrow \Xi^- \pi^+ \pi^+$

Ξ_c^0 MEAN LIFE

VALUE (10^{-15} s)	EVTS	DOCUMENT ID	TECN	COMMENT
112⁺¹³₋₁₀	OUR AVERAGE			
118 ⁺¹⁴ ₋₁₂ ± 5	110	LINK	02H FOCS	γ nucleus, ≈ 180 GeV
101 ⁺²⁵ ₋₁₇ ± 5	42	FRABETTI	93C E687	γ Be, $\bar{E}_\gamma = 220$ GeV
82 ⁺⁵⁹ ₋₃₀	4	BARLAG	90 ACCM	$\pi^- (K^-)$ Cu 230 GeV

Ξ_c^0 DECAY MODES

No absolute branching fractions have been measured. Several measurements of ratios of fractions may be found in the Listings that follow.

Mode	Fraction (Γ_i/Γ)
Γ_1 $pK^-K^-\pi^+$	seen
Γ_2 $pK^-\bar{K}^*(892)^0$	seen
Γ_3 $pK^-K^-\pi^+$ no $\bar{K}^*(892)^0$	seen
Γ_4 ΛK_S^0	seen
Γ_5 $\Lambda K^-\pi^+$	
Γ_6 $\Lambda\bar{K}^0\pi^+\pi^-$	seen
Γ_7 $\Lambda K^-\pi^+\pi^+\pi^-$	seen
Γ_8 $\Xi^-\pi^+$	seen
Γ_9 $\Xi^-\pi^+\pi^+\pi^-$	seen
Γ_{10} Ω^-K^+	seen
Γ_{11} $\Xi^-e^+\nu_e$	seen
Γ_{12} $\Xi^-\ell^+$ anything	seen

Ξ_c^0 BRANCHING RATIOS

$\Gamma(pK^-K^-\pi^+)/\Gamma(\Xi^-\pi^+)$ Γ_1/Γ_8

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
0.34±0.04 OUR AVERAGE				
0.33±0.03±0.03	1908 ± 62	LESIK	05	BELL e^+e^- , $\gamma(4S)$
0.35±0.06±0.03	148 ± 18	DANKO	04	CLEO e^+e^-

$\Gamma(pK^-\bar{K}^*(892)^0)/\Gamma(\Xi^-\pi^+)$ Γ_2/Γ_8

Unseen decay modes of the $\bar{K}^*(892)^0$ are included.

VALUE	DOCUMENT ID	TECN	COMMENT
0.210±0.045±0.015	DANKO	04	CLEO e^+e^-
••• We do not use the following data for averages, fits, limits, etc. •••			
seen	BARLAG	90	ACCM $\pi^- (K^-)$ Cu 230 GeV

$\Gamma(pK^-K^-\pi^+ \text{ no } \bar{K}^*(892)^0)/\Gamma(\Xi^-\pi^+)$ Γ_3/Γ_8

VALUE	DOCUMENT ID	TECN	COMMENT
0.21±0.04±0.02	DANKO	04	CLEO e^+e^-

$\Gamma(\Lambda K_S^0)/\Gamma(\Xi^-\pi^+)$ Γ_4/Γ_8

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
0.21±0.02 ±0.02	465 ± 37	LESIK	05	BELL e^+e^- , $\gamma(4S)$
••• We do not use the following data for averages, fits, limits, etc. •••				
seen	7	ALBRECHT	95B	ARG $e^+e^- \approx 10.4$ GeV

$\Gamma(\Lambda K^-\pi^+)/\Gamma(\Xi^-\pi^+)$ Γ_5/Γ_8

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
1.07±0.12±0.07	2979 ± 211	LESIK	05	BELL e^+e^- , $\gamma(4S)$

$\Gamma(\Lambda\bar{K}^0\pi^+\pi^-)/\Gamma_{\text{total}}$				Γ_6/Γ
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
seen	FRABETTI	98B E687	γ Be, $\bar{E}_\gamma = 220$ GeV	

$\Gamma(\Lambda K^-\pi^+\pi^-\pi^-)/\Gamma_{\text{total}}$				Γ_7/Γ
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
seen	FRABETTI	98B E687	γ Be, $\bar{E}_\gamma = 220$ GeV	

$\Gamma(\Xi^-\pi^+)/\Gamma(\Xi^-\pi^+\pi^+\pi^-)$				Γ_8/Γ_9
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
0.30±0.12±0.05	ALBRECHT	90F ARG	e^+e^- at $\Upsilon(4S)$	

$\Gamma(\Omega^-K^+)/\Gamma(\Xi^-\pi^+)$				Γ_{10}/Γ_8
<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.297±0.024 OUR AVERAGE				
0.294±0.018±0.016	650	AUBERT,B	05M BABR	$e^+e^- \approx \Upsilon(4S)$
0.50 ±0.21 ±0.05	9	HENDERSON	92B CLEO	$e^+e^- \approx 10.6$ GeV

$\Gamma(\Xi^-e^+\nu_e)/\Gamma(\Xi^-\pi^+)$				Γ_{11}/Γ_8
<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
3.1±1.0^{+0.3}_{-0.5}	54	ALEXANDER	95B CLE2	$e^+e^- \approx \Upsilon(4S)$

$\Gamma(\Xi^-\ell^+\text{anything})/\Gamma(\Xi^-\pi^+)$				Γ_{12}/Γ_8
The ratio is for the <i>average</i> (not the sum) of the Ξ^-e^+ anything and $\Xi^-\mu^+$ anything modes.				
<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.96±0.43±0.18	18	ALBRECHT	93B ARG	$e^+e^- \approx 10.4$ GeV

$\Gamma(\Xi^-\ell^+\text{anything})/\Gamma(\Xi^-\pi^+\pi^+\pi^-)$				Γ_{12}/Γ_9
The ratio is for the <i>average</i> (not the sum) of the Ξ^-e^+ anything and $\Xi^-\mu^+$ anything modes.				
<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.29±0.12±0.04	18	ALBRECHT	93B ARG	$e^+e^- \approx 10.4$ GeV

Ξ_c^0 DECAY PARAMETERS

See the note on "Baryon Decay Parameters" in the neutron Listings.

α FOR $\Xi_c^0 \rightarrow \Xi^-\pi^+$				
<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
-0.56±0.39^{+0.10}_{-0.09}	138	CHAN	01 CLE2	$e^+e^- \approx \Upsilon(4S)$

REFERENCES

AUBERT,B	05M	PRL 95 142003	B. Aubert <i>et al.</i>	(BABAR Collab.)
LESIK	05	PL B605 237	T. Lesiak <i>et al.</i>	(BELLE Collab.)
Also		PL B617 198 (erratum)	T. Lesiak <i>et al.</i>	(BELLE Collab.)
DANKO	04	PR D69 052004	I. Danko <i>et al.</i>	(CLEO Collab.)
LINK	02H	PL B541 211	J.M. Link <i>et al.</i>	(FNAL FOCUS Collab.)
CHAN	01	PR D63 111102R	S. Chan <i>et al.</i>	(CLEO Collab.)
FRABETTI	98B	PL B426 403	P.L. Frabetti <i>et al.</i>	(FNAL E687 Collab.)
ALBRECHT	95B	PL B342 397	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
ALEXANDER	95B	PRL 74 3113	J. Alexander <i>et al.</i>	(CLEO Collab.)
Also		PRL 75 4155 (erratum)	J. Alexander <i>et al.</i>	(CLEO Collab.)
ALBRECHT	93B	PL B303 368	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
FRABETTI	93C	PRL 70 2058	P.L. Frabetti <i>et al.</i>	(FNAL E687 Collab.)
HENDERSON	92B	PL B283 161	S. Henderson <i>et al.</i>	(CLEO Collab.)
ALBRECHT	90F	PL B247 121	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
BARLAG	90	PL B236 495	S. Barlag <i>et al.</i>	(ACCMOR Collab.)
ALAM	89	PL B226 401	M.S. Alam <i>et al.</i>	(CLEO Collab.)
AVERY	89	PRL 62 863	P. Avery <i>et al.</i>	(CLEO Collab.)
