



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

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
2470.85^{+0.28}_{-0.40} OUR FIT				
2470.99^{+0.30}_{-0.50} OUR AVERAGE				
2470.85 ± 0.24 ± 0.55	3.4k	AALTONEN	14B	CDF $p\bar{p}$ at 1.96 TeV
2471.0 ± 0.3 ^{+0.2} _{-1.4}	8.6k	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)	EVTS	DOCUMENT ID	TECN	COMMENT
2.93 ± 0.24 OUR FIT				
2.91 ± 0.26 OUR AVERAGE				
2.85 ± 0.30 ± 0.04	5.1/3.4k	AALTONEN	14B	CDF $p\bar{p}$ at 1.96 TeV
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_{-10}^{+13} OUR AVERAGE				
$118_{-12}^{+14} \pm 5$	110	LINK	02H FOCS	γ nucleus, ≈ 180 GeV
$101_{-17}^{+25} \pm 5$	42	FRABETTI	93C E687	γ Be, $\bar{E}_\gamma = 220$ GeV
82_{-30}^{+59}	4	BARLAG	90 ACCM	π^- (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)
No absolute branching fractions have been measured. The following are branching <i>ratios</i> relative to $\Xi^- \pi^+$.	
Cabibbo-favored ($S = -2$) decays — relative to $\Xi^- \pi^+$	
Γ_1 $p K^- K^- \pi^+$	0.34 ± 0.04
Γ_2 $p K^- \bar{K}^*(892)^0$	0.21 ± 0.05
Γ_3 $p K^- K^- \pi^+$ (no \bar{K}^{*0})	0.21 ± 0.04
Γ_4 ΛK_S^0	0.210 ± 0.028
Γ_5 $\Lambda K^- \pi^+$	1.07 ± 0.14
Γ_6 $\Lambda \bar{K}^0 \pi^+ \pi^-$	seen
Γ_7 $\Lambda K^- \pi^+ \pi^+ \pi^-$	seen
Γ_8 $\Xi^- \pi^+$	DEFINED AS 1
Γ_9 $\Xi^- \pi^+ \pi^+ \pi^-$	3.3 ± 1.4
Γ_{10} $\Omega^- K^+$	0.297 ± 0.024
Γ_{11} $\Xi^- e^+ \nu_e$	3.1 ± 1.1
Γ_{12} $\Xi^- \ell^+$ anything	1.0 ± 0.5
Cabibbo-suppressed decays — relative to $\Xi^- \pi^+$	
Γ_{13} $\Xi^- K^+$	0.028 ± 0.006
Γ_{14} $\Lambda K^+ K^-$ (no ϕ)	0.029 ± 0.007
Γ_{15} $\Lambda \phi$	0.034 ± 0.007

Ξ_c^0 BRANCHING RATIOS

———— Cabibbo-favored ($S = -2$) decays ————

$\Gamma(p K^- K^- \pi^+)/\Gamma(\Xi^- \pi^+)$		Γ_1/Γ_8		
VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
0.34 ± 0.04 OUR AVERAGE				
$0.33 \pm 0.03 \pm 0.03$	1908 ± 62	LESLIAK	05 BELL	$e^+ e^-$, $\gamma(4S)$
$0.35 \pm 0.06 \pm 0.03$	148 ± 18	DANKO	04 CLEO	$e^+ e^-$

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

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

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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

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

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.21±0.04±0.02	DANKO 04	CLEO	$e^+ e^-$

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

<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.21±0.02±0.02	465 ± 37	LESLIAK 05	BELL	$e^+ e^-$, $\Upsilon(4S)$
• • • 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

<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
1.07±0.12±0.07	2979 ± 211	LESLIAK 05	BELL	$e^+ e^-$, $\Upsilon(4S)$

$\Gamma(\Lambda \bar{K}^0 \pi^+ \pi^-)/\Gamma_{\text{total}}$ 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 *average* (not the sum) of the $\Xi^- e^+$ 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 *average* (not the sum) of the $\Xi^- e^+$ anything and $\Xi^- \mu^+$ anything modes.

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
0.29±0.12±0.04	18	ALBRECHT	93B ARG	$e^+ e^- \approx 10.4$ GeV

———— Cabibbo-suppressed decays ————

 $\Gamma(\Xi^- K^+)/\Gamma(\Xi^- \pi^+)$ Γ_{13}/Γ_8

VALUE (units 10^{-2})	EVTS	DOCUMENT ID	TECN	COMMENT
2.75±0.51±0.25	314 ± 58	CHISTOV	13 BELL	$e^+ e^- \approx \Upsilon(4S)$

 $\Gamma(\Lambda K^+ K^- (\text{no } \phi))/\Gamma(\Xi^- \pi^+)$ Γ_{14}/Γ_8

VALUE (units 10^{-2})	EVTS	DOCUMENT ID	TECN	COMMENT
2.86±0.61±0.37	510 ± 110	CHISTOV	13 BELL	$e^+ e^- \approx \Upsilon(4S)$

 $\Gamma(\Lambda \phi)/\Gamma(\Xi^- \pi^+)$ Γ_{15}/Γ_8

VALUE (units 10^{-2})	EVTS	DOCUMENT ID	TECN	COMMENT
3.43±0.58±0.32	316 ± 54	CHISTOV	13 BELL	$e^+ e^- \approx \Upsilon(4S)$

 Ξ_c^0 DECAY PARAMETERS

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

 α FOR $\Xi_c^0 \rightarrow \Xi^- \pi^+$

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
-0.56±0.39^{+0.10}_{-0.09}	138	CHAN	01 CLE2	$e^+ e^- \approx \Upsilon(4S)$

 Ξ_c^0 REFERENCES

AALTONEN	14B	PR D89 072014	T. Aaltonen <i>et al.</i>	(CDF Collab.)
CHISTOV	13	PR D88 071103	R. Chistov <i>et al.</i>	(BELLE Collab.)
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 (errata)	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 111102	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.)