



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

Neither 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
2470.90^{+0.22}_{-0.29}				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
2.96 ± 0.22				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
153 ± 6				OUR AVERAGE Error includes scale factor of 2.4.
154.5 ± 2.4 ± 1.1	22k	¹ AAIJ	19AG	LHCB $\Xi_c^0 \rightarrow p K^- K^- \pi^+$
118 ⁺¹⁴ ₋₁₂ ± 5	110	LINK	02H	FOCS γ nucleus, ≈ 180 GeV

101	$\begin{matrix} +25 \\ -17 \end{matrix} \pm 5$	42	FRABETTI	93C E687	γ Be, $\bar{E}_\gamma = 220$ GeV
82	$\begin{matrix} +59 \\ -30 \end{matrix}$	4	BARLAG	90 ACCM	π^- (K^-) Cu 230 GeV

¹AAIJ 19AG reports $[\Xi_c^0 \text{ MEAN LIFE}] / [D^\pm \text{ MEAN LIFE}] = 0.1485 \pm 0.0017 \pm 0.0016$ which we multiply by our best value $D^\pm \text{ MEAN LIFE} = (1.040 \pm 0.007) \times 10^{-12}$ s. Our first error is their experiment's error and our second error is the systematic error from using our best value.

Ξ_c^0 DECAY MODES

Mode	Fraction (Γ_i/Γ)	Scale factor	
Cabibbo-favored (S = -2) decays			
Γ_1	$pK^- K^- \pi^+$	$(4.8 \pm 1.2) \times 10^{-3}$	1.1
Γ_2	$pK^- \bar{K}^*(892)^0, \bar{K}^{*0} \rightarrow K^- \pi^+$	$(2.0 \pm 0.6) \times 10^{-3}$	
Γ_3	$pK^- K^- \pi^+$ (no \bar{K}^{*0})	$(3.0 \pm 0.9) \times 10^{-3}$	
Γ_4	ΛK_S^0	$(3.0 \pm 0.8) \times 10^{-3}$	
Γ_5	$\Lambda K^- \pi^+$	$(1.45 \pm 0.33) \%$	1.1
Γ_6	$\Lambda \bar{K}^0 \pi^+ \pi^-$	seen	
Γ_7	$\Lambda K^- \pi^+ \pi^+ \pi^-$	seen	
Γ_8	$\Xi^- \pi^+$	$(1.43 \pm 0.32) \%$	1.1
Γ_9	$\Xi^- \pi^+ \pi^+ \pi^-$	$(4.8 \pm 2.3) \%$	
Γ_{10}	$\Omega^- K^+$	$(4.2 \pm 1.0) \times 10^{-3}$	
Γ_{11}	$\Xi^- e^+ \nu_e$	$(1.8 \pm 1.2) \%$	
Cabibbo-suppressed decays			
Γ_{12}	$\Xi^- K^+$	$(3.9 \pm 1.2) \times 10^{-4}$	
Γ_{13}	$\Lambda K^+ K^-$ (no ϕ)	$(4.1 \pm 1.4) \times 10^{-4}$	
Γ_{14}	$\Lambda \phi$	$(4.9 \pm 1.5) \times 10^{-4}$	

CONSTRAINED FIT INFORMATION

An overall fit to 5 branching ratios uses 6 measurements and one constraint to determine 4 parameters. The overall fit has a $\chi^2 = 1.4$ for 3 degrees of freedom.

The following *off-diagonal* array elements are the correlation coefficients $\langle \delta x_i \delta x_j \rangle / (\delta x_i \delta x_j)$, in percent, from the fit to the branching fractions, $x_i \equiv \Gamma_i / \Gamma_{\text{total}}$. The fit constrains the x_i whose labels appear in this array to sum to one.

x_5	68	
x_8	89	76
	x_1	x_5

Ξ_c^0 BRANCHING RATIOSCabibbo-favored ($S = -2$) decays $\Gamma(\rho K^- K^- \pi^+)/\Gamma_{\text{total}}$ Γ_1/Γ

VALUE (%)	EVTS	DOCUMENT ID	TECN	COMMENT
0.48±0.12 OUR FIT	Error includes scale factor of 1.1.			
0.58±0.23±0.05	17 ± 5	LI	19A	BELL $e^+ e^-$ at $\Upsilon(4S)$

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

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
0.339±0.035 OUR FIT				
0.34 ±0.04 OUR AVERAGE				
0.33 ±0.03 ±0.03	1908 ± 62	LESLIAK	05	BELL $e^+ e^-$, $\Upsilon(4S)$
0.35 ±0.06 ±0.03	148 ± 18	DANKO	04	CLEO $e^+ e^-$

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

VALUE	DOCUMENT ID	TECN	COMMENT
0.14±0.03±0.01	DANKO	04	CLEO $e^+ e^-$

 $\Gamma(\rho K^- K^- \pi^+ (\text{no } \bar{K}^{*0}))/\Gamma(\Xi^- \pi^+)$ 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	LESLIAK	05	BELL $e^+ e^-$, $\Upsilon(4S)$

 $\Gamma(\Lambda K^- \pi^+)/\Gamma_{\text{total}}$ Γ_5/Γ

VALUE (%)	EVTS	DOCUMENT ID	TECN	COMMENT
1.45±0.33 OUR FIT	Error includes scale factor of 1.1.			
1.17±0.37±0.09	24 ± 6	LI	19A	BELL $e^+ e^-$ at $\Upsilon(4S)$

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

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
1.02±0.15 OUR FIT	Error includes scale factor of 1.2.			
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

VALUE	DOCUMENT ID	TECN	COMMENT
seen	FRABETTI	98B	E687 γ Be, $\bar{E}_\gamma = 220$ GeV

 $\Gamma(\Lambda K^- \pi^+ \pi^+ \pi^-)/\Gamma_{\text{total}}$ Γ_7/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
seen	FRABETTI	98B	E687 γ Be, $\bar{E}_\gamma = 220$ GeV

 $\Gamma(\Xi^- \pi^+)/\Gamma_{\text{total}}$ Γ_8/Γ

VALUE (%)	EVTS	DOCUMENT ID	TECN	COMMENT
1.43±0.32 OUR FIT	Error includes scale factor of 1.1.			
1.80±0.50±0.14	45 ± 7	LI	19A	BELL $e^+ e^-$ at $\Upsilon(4S)$

$\Gamma(\Xi^- \pi^+)/\Gamma(\Xi^- \pi^+ \pi^+ \pi^-)$	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>
0.294±0.018±0.016	650	AUBERT,B	05M BABR	$e^+e^- \approx \Upsilon(4S)$

$\Gamma(\Xi^- e^+ \nu_e)/\Gamma(\Xi^- \pi^+)$	Γ_{11}/Γ_8			
<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
1.3 ±0.8 OUR AVERAGE	Error includes scale factor of 1.8.			

3.1 ±1.0 $\begin{smallmatrix} +0.3 \\ -0.5 \end{smallmatrix}$	54	ALEXANDER	95B CLE2	$e^+e^- \approx \Upsilon(4S)$
0.96±0.43±0.18	18	¹ ALBRECHT	93B ARG	$e^+e^- \approx 10.4$ GeV

¹This ALBRECHT 93B value is the average of the $(\Xi^- e^+ \text{ anything})/\Xi^- \pi^+$ and $(\Xi^- \mu^+ \text{ anything})/\Xi^- \pi^+$ ratios. Here we average it with the $\Xi^- e^+ \nu_e/\Xi^- \pi^+$ ratio.

———— Cabibbo-suppressed decays ————

$\Gamma(\Xi^- K^+)/\Gamma(\Xi^- \pi^+)$	Γ_{12}/Γ_8			
<u>VALUE (units 10^{-2})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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_{13}/Γ_8			
<u>VALUE (units 10^{-2})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
2.86±0.61±0.37	510 ± 110	CHISTOV	13 BELL	$e^+e^- \approx \Upsilon(4S)$

$\Gamma(\Lambda \phi)/\Gamma(\Xi^- \pi^+)$	Γ_{14}/Γ_8			
<u>VALUE (units 10^{-2})</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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 $\Xi_c^0 \rightarrow \Xi^- \pi^+$				
<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
-0.56±0.39 $\begin{smallmatrix} +0.10 \\ -0.09 \end{smallmatrix}$	138	CHAN	01 CLE2	$e^+e^- \approx \Upsilon(4S)$

Ξ_c^0 REFERENCES

AAIJ	19AG PR D100 032001	R. Aaij <i>et al.</i>	(LHCb Collab.)
LI	19A PRL 122 082001	Y.B. Li <i>et al.</i>	(BELLE Collab.)
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 (errat.)	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.)
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.)
