CHARMED BARYONS
$(C = +1)$

$\Lambda_c^+ = udc$, $\Sigma_c^{++} = uuc$, $\Sigma_c^+ = udc$, $\Sigma_c^0 = ddc$,
$\Xi_c^+ = usc$, $\Xi_c^0 = dsc$, $\Omega_c^0 = ssc$

Λ_c^+

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

J is not well measured; $\frac{1}{2}$ is the quark-model prediction.

Mass $m = 2286.46 \pm 0.14$ MeV
Mean life $\tau = (200 \pm 6) \times 10^{-15}$ s (S = 1.6)
$c\tau = 59.9$ μm

Decay asymmetry parameters

$\Lambda\pi^+$ $\alpha = -0.91 \pm 0.15$
$\Sigma^+\pi^0$ $\alpha = -0.45 \pm 0.32$
$\Lambda\ell^+\nu_\ell$ $\alpha = -0.86 \pm 0.04$
$(\alpha + \overline{\alpha})/(\alpha - \overline{\alpha})$ in $\Lambda_c^+ \rightarrow \Lambda\pi^+$, $\overline{\Lambda}_c^- \rightarrow \overline{\Lambda}\pi^- = -0.07 \pm 0.31$
$(\alpha + \overline{\alpha})/(\alpha - \overline{\alpha})$ in $\Lambda_c^+ \rightarrow \Lambda e^+\nu_e$, $\overline{\Lambda}_c^- \rightarrow \overline{\Lambda} e^-\overline{\nu}_e = 0.00 \pm 0.04$

Nearly all branching fractions of the Λ_c^+ are measured relative to the $pK^-\pi^+$ mode, but there are no model-independent measurements of this branching fraction. We explain how we arrive at our value of B($\Lambda_c^+ \rightarrow pK^-\pi^+$) in a Note at the beginning of the branching-ratio measurements in the Listings. When this branching fraction is eventually well determined, all the other branching fractions will slide up or down proportionally as the true value differs from the value we use here.

Λ_c^+ DECAY MODES		Fraction (Γ_i/Γ)	Scale factor/ Confidence level	p (MeV/c)
Hadronic modes with a p: $S = -1$ final states				
$p\overline{K}^0$		(2.3 ± 0.6) %		873
$pK^-\pi^+$	[a]	(5.0 ± 1.3) %		823
$p\overline{K}^*(892)^0$	[b]	(1.6 ± 0.5) %		685
$\Delta(1232)^{++}K^-$		(8.6 ± 3.0) $\times 10^{-3}$		710
$\Lambda(1520)\pi^+$	[b]	(1.8 ± 0.6) %		627
$pK^-\pi^+$ nonresonant		(2.8 ± 0.8) %		823
$p\overline{K}^0\pi^0$		(3.3 ± 1.0) %		823
$p\overline{K}^0\eta$		(1.2 ± 0.4) %		568

$p\overline{K}^0\pi^+\pi^-$		(2.6 ± 0.7) %		754
$pK^-\pi^+\pi^0$		(3.4 ± 1.0) %		759
$pK^*(892)^-\pi^+$	[b]	(1.1 ± 0.5) %		580
$p(K^-\pi^+)_{\text{nonresonant}}\pi^0$		(3.6 ± 1.2) %		759
$\Delta(1232)\overline{K}^*(892)$		seen		419
$pK^-\pi^+\pi^+\pi^-$		$(1.1 \pm 0.8) \times 10^{-3}$		671
$pK^-\pi^+\pi^0\pi^0$		$(8 \pm 4) \times 10^{-3}$		678

Hadronic modes with a p: $S = 0$ final states

$p\pi^+\pi^-$		$(3.5 \pm 2.0) \times 10^{-3}$		927
$pf_0(980)$	[b]	$(2.8 \pm 1.9) \times 10^{-3}$		614
$p\pi^+\pi^+\pi^-\pi^-$		$(1.8 \pm 1.2) \times 10^{-3}$		852
pK^+K^-		$(7.7 \pm 3.5) \times 10^{-4}$		616
$p\phi$	[b]	$(8.2 \pm 2.7) \times 10^{-4}$		590
pK^+K^- non-ϕ		$(3.5 \pm 1.7) \times 10^{-4}$		616

Hadronic modes with a hyperon: $S = -1$ final states

$\Lambda\pi^+$		(1.07 ± 0.28) %		864
$\Lambda\pi^+\pi^0$		(3.6 ± 1.3) %		844
$\Lambda\rho^+$		< 5 %	CL=95%	636
$\Lambda\pi^+\pi^+\pi^-$		(2.6 ± 0.7) %		807
$\Sigma(1385)^+\pi^+\pi^-$, $\Sigma^{*+} \to \Lambda\pi^+$		$(7 \pm 4) \times 10^{-3}$		688
$\Sigma(1385)^-\pi^+\pi^+$, $\Sigma^{*-} \to \Lambda\pi^-$		$(5.5 \pm 1.7) \times 10^{-3}$		688
$\Lambda\pi^+\rho^0$		(1.1 ± 0.5) %		524
$\Sigma(1385)^+\rho^0$, $\Sigma^{*+} \to \Lambda\pi^+$		$(3.7 \pm 3.1) \times 10^{-3}$		363
$\Lambda\pi^+\pi^+\pi^-$ nonresonant		$< 8 \times 10^{-3}$	CL=90%	807
$\Lambda\pi^+\pi^+\pi^-\pi^0$ total		(1.8 ± 0.8) %		757
$\Lambda\pi^+\eta$	[b]	(1.8 ± 0.6) %		691
$\Sigma(1385)^+\eta$	[b]	$(8.5 \pm 3.3) \times 10^{-3}$		570
$\Lambda\pi^+\omega$	[b]	(1.2 ± 0.5) %		517
$\Lambda\pi^+\pi^+\pi^-\pi^0$, no η or ω		$< 7 \times 10^{-3}$	CL=90%	757
$\Lambda K^+\overline{K}^0$		$(4.7 \pm 1.5) \times 10^{-3}$	S=1.2	443
$\Xi(1690)^0K^+$, $\Xi^{*0} \to \Lambda\overline{K}^0$		$(1.3 \pm 0.5) \times 10^{-3}$		286
$\Sigma^0\pi^+$		(1.05 ± 0.28) %		825
$\Sigma^+\pi^0$		(1.00 ± 0.34) %		827
$\Sigma^+\eta$		$(5.5 \pm 2.3) \times 10^{-3}$		713
$\Sigma^+\pi^+\pi^-$		(3.6 ± 1.0) %		804
$\Sigma^+\rho^0$		< 1.4 %	CL=95%	575
$\Sigma^-\pi^+\pi^+$		(1.7 ± 0.5) %		799
$\Sigma^0\pi^+\pi^0$		(1.8 ± 0.8) %		803
$\Sigma^0\pi^+\pi^+\pi^-$		$(8.3 \pm 3.1) \times 10^{-3}$		763
$\Sigma^+\pi^+\pi^-\pi^0$		—		767
$\Sigma^+\omega$	[b]	(2.7 ± 1.0) %		569

$\Sigma^+ K^+ K^-$		$(2.8 \pm 0.8) \times 10^{-3}$		349
$\Sigma^+ \phi$	[b]	$(3.1 \pm 0.9) \times 10^{-3}$		295
$\Xi(1690)^0 K^+$, $\Xi^{*0} \to \Sigma^+ K^-$		$(8.1 \pm 3.0) \times 10^{-4}$		286
$\Sigma^+ K^+ K^-$ nonresonant		$< 6 \times 10^{-4}$	CL=90%	349
$\Xi^0 K^+$		$(3.9 \pm 1.4) \times 10^{-3}$		653
$\Xi^- K^+ \pi^+$		$(5.1 \pm 1.4) \times 10^{-3}$		565
$\Xi(1530)^0 K^+$	[b]	$(2.6 \pm 1.0) \times 10^{-3}$		473

Hadronic modes with a hyperon: $S = 0$ final states

ΛK^+		$(5.0 \pm 1.6) \times 10^{-4}$		781
$\Lambda K^+ \pi^+ \pi^-$		$< 4 \times 10^{-4}$	CL=90%	637
$\Sigma^0 K^+$		$(4.2 \pm 1.3) \times 10^{-4}$		735
$\Sigma^0 K^+ \pi^+ \pi^-$		$< 2.1 \times 10^{-4}$	CL=90%	574
$\Sigma^+ K^+ \pi^-$		$(1.7 \pm 0.7) \times 10^{-3}$		670
$\Sigma^+ K^*(892)^0$	[b]	$(2.8 \pm 1.1) \times 10^{-3}$		470
$\Sigma^- K^+ \pi^+$		$< 1.0 \times 10^{-3}$	CL=90%	664

Doubly Cabibbo-suppressed modes

$p K^+ \pi^-$		$< 2.3 \times 10^{-4}$	CL=90%	823

Semileptonic modes

$\Lambda \ell^+ \nu_\ell$	[c]	(2.0 ± 0.6) %		871
$\Lambda e^+ \nu_e$		(2.1 ± 0.6) %		871
$\Lambda \mu^+ \nu_\mu$		(2.0 ± 0.7) %		867

Inclusive modes

e^+ anything		(4.5 ± 1.7) %		–
$p e^+$ anything		(1.8 ± 0.9) %		–
p anything		(50 ± 16) %		–
p anything (no Λ)		(12 ± 19) %		–
n anything		(50 ± 16) %		–
n anything (no Λ)		(29 ± 17) %		–
Λ anything		(35 ± 11) %	S=1.4	–
$\Sigma^\pm$ anything	[d]	(10 ± 5) %		–
3prongs		(24 ± 8) %		–

$\Delta C = 1$ weak neutral current ($C1$) modes, or Lepton Family number (LF), or Lepton number (L), or Baryon number (B) violating modes

$p e^+ e^-$	$C1$	$< 5.5 \times 10^{-6}$	CL=90%	951
$p \mu^+ \mu^-$	$C1$	$< 4.4 \times 10^{-5}$	CL=90%	937
$p e^+ \mu^-$	LF	$< 9.9 \times 10^{-6}$	CL=90%	947
$p e^- \mu^+$	LF	$< 1.9 \times 10^{-5}$	CL=90%	947

$\overline{p}2e^+$	L,B	$<$ 2.7	$\times 10^{-6}$	CL=90%	951
$\overline{p}2\mu^+$	L,B	$<$ 9.4	$\times 10^{-6}$	CL=90%	937
$\overline{p}e^+\mu^+$	L,B	$<$ 1.6	$\times 10^{-5}$	CL=90%	947
$\Sigma^-\mu^+\mu^+$	L	$<$ 7.0	$\times 10^{-4}$	CL=90%	812

$\Lambda_c(2595)^+$

$I(J^P) = 0(\frac{1}{2}^-)$

The spin-parity follows from the fact that $\Sigma_c(2455)\pi$ decays, with little available phase space, are dominant. This assumes that $J^P = 1/2^+$ for the $\Sigma_c(2455)$.

Mass $m = 2592.25 \pm 0.28$ MeV
$m - m_{\Lambda_c^+} = 305.79 \pm 0.24$ MeV
Full width $\Gamma = 2.6 \pm 0.6$ MeV

$\Lambda_c^+\pi\pi$ and its submode $\Sigma_c(2455)\pi$ — the latter just barely — are the only strong decays allowed to an excited Λ_c^+ having this mass; and the submode seems to dominate.

$\Lambda_c(2595)^+$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$\Lambda_c^+\pi^+\pi^-$	[e] $\approx$ 67 %	117
$\Sigma_c(2455)^{++}\pi^-$	24 $\pm$ 7 %	†
$\Sigma_c(2455)^0\pi^+$	24 $\pm$ 7 %	†
$\Lambda_c^+\pi^+\pi^-$ 3-body	18 $\pm$ 10 %	117
$\Lambda_c^+\pi^0$	[f] not seen	258
$\Lambda_c^+\gamma$	not seen	288

$\Lambda_c(2625)^+$

$I(J^P) = 0(\frac{3}{2}^-)$

J^P has not been measured; $\frac{3}{2}^-$ is the quark-model prediction.

Mass $m = 2628.11 \pm 0.19$ MeV (S = 1.1)
$m - m_{\Lambda_c^+} = 341.65 \pm 0.13$ MeV (S = 1.1)
Full width $\Gamma < 0.97$ MeV, CL = 90%

$\Lambda_c^+\pi\pi$ and its submode $\Sigma(2455)\pi$ are the only strong decays allowed to an excited Λ_c^+ having this mass.

$\Lambda_c(2625)^+$ DECAY MODES	Fraction (Γ_i/Γ)	Confidence level	p (MeV/c)
$\Lambda_c^+\pi^+\pi^-$	[e] $\approx$67%		184
$\Sigma_c(2455)^{++}\pi^-$	<5	90%	102

$\Sigma_c(2455)^0\pi^+$		<5	90%	102
$\Lambda_c^+\pi^+\pi^-$ 3-body		large		184
$\Lambda_c^+\pi^0$	[f]	not seen		293
$\Lambda_c^+\gamma$		not seen		319

$\Lambda_c(2880)^+$

$I(J^P) = 0(\frac{5}{2}^+)$

There is some good evidence that indeed $J^P = 5/2^+$

Mass $m = 2881.53 \pm 0.35$ MeV
$m - m_{\Lambda_c^+} = 595.1 \pm 0.4$ MeV
Full width $\Gamma = 5.8 \pm 1.1$ MeV

$\Lambda_c(2880)^+$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$\Lambda_c^+\pi^+\pi^-$	seen	471
$\Sigma_c(2455)^{0,++}\pi^\pm$	seen	376
$\Sigma_c(2520)^{0,++}\pi^\pm$	seen	317
pD^0	seen	316

$\Lambda_c(2940)^+$

$I(J^P) = 0(?^?)$

Mass $m = 2939.3^{+1.4}_{-1.5}$ MeV
Full width $\Gamma = 17^{+8}_{-6}$ MeV

$\Lambda_c(2940)^+$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
pD^0	seen	420
$\Sigma_c(2455)^{0,++}\pi^\pm$	seen	–

$\Sigma_c(2455)$

$I(J^P) = 1(\frac{1}{2}^+)$

$\Sigma_c(2455)^{++}$ mass $m = 2453.98 \pm 0.16$ MeV
$\Sigma_c(2455)^+$ mass $m = 2452.9 \pm 0.4$ MeV
$\Sigma_c(2455)^0$ mass $m = 2453.74 \pm 0.16$ MeV
$m_{\Sigma_c^{++}} - m_{\Lambda_c^+} = 167.52 \pm 0.08$ MeV
$m_{\Sigma_c^+} - m_{\Lambda_c^+} = 166.4 \pm 0.4$ MeV
$m_{\Sigma_c^0} - m_{\Lambda_c^+} = 167.27 \pm 0.08$ MeV
$m_{\Sigma_c^{++}} - m_{\Sigma_c^0} = 0.24 \pm 0.09$ MeV (S = 1.1)
$m_{\Sigma_c^+} - m_{\Sigma_c^0} = -0.9 \pm 0.4$ MeV

$\Sigma_c(2455)^{++}$ full width $\Gamma = 2.26 \pm 0.25$ MeV
$\Sigma_c(2455)^{+}$ full width $\Gamma < 4.6$ MeV, CL = 90%
$\Sigma_c(2455)^{0}$ full width $\Gamma = 2.16 \pm 0.26$ MeV (S = 1.1)

$\Lambda_c^+ \pi$ is the only strong decay allowed to a Σ_c having this mass.

$\Sigma_c(2455)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$\Lambda_c^+ \pi$	≈ 100 %	94

$\Sigma_c(2520)$

$I(J^P) = 1(\frac{3}{2}^+)$

J^P has not been measured; $\frac{3}{2}^+$ is the quark-model prediction.

$\Sigma_c(2520)^{++}$ mass $m = 2517.9 \pm 0.6$ MeV (S = 1.6)
$\Sigma_c(2520)^{+}$ mass $m = 2517.5 \pm 2.3$ MeV
$\Sigma_c(2520)^{0}$ mass $m = 2518.8 \pm 0.6$ MeV (S = 1.5)
$m_{\Sigma_c(2520)^{++}} - m_{\Lambda_c^+} = 231.4 \pm 0.6$ MeV (S = 1.6)
$m_{\Sigma_c(2520)^{+}} - m_{\Lambda_c^+} = 231.0 \pm 2.3$ MeV
$m_{\Sigma_c(2520)^{0}} - m_{\Lambda_c^+} = 232.3 \pm 0.5$ MeV (S = 1.6)
$m_{\Sigma_c(2520)^{++}} - m_{\Sigma_c(2520)^{0}}$
$\Sigma_c(2520)^{++}$ full width $\Gamma = 14.9 \pm 1.5$ MeV
$\Sigma_c(2520)^{+}$ full width $\Gamma < 17$ MeV, CL = 90%
$\Sigma_c(2520)^{0}$ full width $\Gamma = 14.5 \pm 1.5$ MeV

$\Lambda_c^+ \pi$ is the only strong decay allowed to a Σ_c having this mass.

$\Sigma_c(2520)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$\Lambda_c^+ \pi$	≈ 100 %	179

$\Sigma_c(2800)$

$I(J^P) = 1(?^?)$

$\Sigma_c(2800)^{++}$ mass $m = 2801^{+4}_{-6}$ MeV
$\Sigma_c(2800)^{+}$ mass $m = 2792^{+14}_{-\ 5}$ MeV
$\Sigma_c(2800)^{0}$ mass $m = 2806^{+5}_{-7}$ MeV (S = 1.3)
$m_{\Sigma_c(2800)^{++}} - m_{\Lambda_c^+} = 514^{+4}_{-6}$ MeV
$m_{\Sigma_c(2800)^{+}} - m_{\Lambda_c^+} = 505^{+14}_{-\ 5}$ MeV
$m_{\Sigma_c(2800)^{0}} - m_{\Lambda_c^+} = 519^{+5}_{-7}$ MeV (S = 1.3)
$\Sigma_c(2800)^{++}$ full width $\Gamma = 75^{+22}_{-17}$ MeV
$\Sigma_c(2800)^{+}$ full width $\Gamma = 62^{+60}_{-40}$ MeV
$\Sigma_c(2800)^{0}$ full width $\Gamma = 72^{+22}_{-15}$ MeV

Σ_c(2800) DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$\Lambda_c^+\pi$	seen	443

Ξ_c^+

$I(J^P) = \frac{1}{2}(\frac{1}{2}^+)$

J^P has not been measured; $\frac{1}{2}^+$ is the quark-model prediction.

Mass $m = 2467.8^{+0.4}_{-0.6}$ MeV
Mean life $\tau = (442 \pm 26) \times 10^{-15}$ s (S = 1.3)
$c\tau = 132\ \mu$m

Ξ_c^+ DECAY MODES		Fraction (Γ_i/Γ)	Confidence level	p (MeV/c)
No absolute branching fractions have been measured. The following are branching *ratios* relative to $\Xi^- 2\pi^+$.				
Cabibbo-favored ($S = -2$) decays — relative to $\Xi^- 2\pi^+$				
$p 2K_S^0$		0.087 ± 0.021		767
$\Lambda \overline{K}^0 \pi^+$		—		852
$\Sigma(1385)^+ \overline{K}^0$	[b]	1.0 ± 0.5		746
$\Lambda K^- 2\pi^+$		0.323 ± 0.033		787
$\Lambda \overline{K}^*(892)^0 \pi^+$	[b]	<0.16	90%	608
$\Sigma(1385)^+ K^- \pi^+$	[b]	<0.23	90%	678
$\Sigma^+ K^- \pi^+$		0.94 ± 0.10		810
$\Sigma^+ \overline{K}^*(892)^0$	[b]	0.81 ± 0.15		658
$\Sigma^0 K^- 2\pi^+$		0.27 ± 0.12		735
$\Xi^0 \pi^+$		0.55 ± 0.16		877
$\Xi^- 2\pi^+$		**DEFINED AS 1**		851
$\Xi(1530)^0 \pi^+$	[b]	<0.10	90%	750
$\Xi^0 \pi^+ \pi^0$		2.3 ± 0.7		856
$\Xi^0 \pi^- 2\pi^+$		1.7 ± 0.5		818
$\Xi^0 e^+ \nu_e$		$2.3 {}^{+0.7}_{-0.8}$		884
$\Omega^- K^+ \pi^+$		0.07 ± 0.04		399
Cabibbo-suppressed decays — relative to $\Xi^- 2\pi^+$				
$p K^- \pi^+$		0.21 ± 0.04		944
$p \overline{K}^*(892)^0$	[b]	0.116 ± 0.030		828
$\Sigma^+ \pi^+ \pi^-$		0.48 ± 0.20		922

$\Sigma^- 2\pi^+$		0.18 ± 0.09		918
$\Sigma^+ K^+ K^-$		0.15 ± 0.06		579
$\Sigma^+ \phi$	[b]	<0.11	90%	549
$\Xi(1690)^0 K^+$, $\Xi(1690)^0 \to \Sigma^+ K^-$		<0.05	90%	501

Ξ_c^0

$$I(J^P) = \tfrac{1}{2}(\tfrac{1}{2}^+)$$

J^P has not been measured; $\frac{1}{2}^+$ is the quark-model prediction.

Mass $m = 2470.88^{+0.34}_{-0.80}$ MeV (S = 1.1)

$m_{\Xi_c^0} - m_{\Xi_c^+} = 3.1^{+0.4}_{-0.5}$ MeV

Mean life $\tau = (112^{+13}_{-10}) \times 10^{-15}$ s

$c\tau = 33.6\ \mu$m

Decay asymmetry parameters

$\Xi^- \pi^+$ $\alpha = -0.6 \pm 0.4$

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

Ξ_c^0 DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
No absolute branching fractions have been measured. The following are branching *ratios* relative to $\Xi^- \pi^+$.		
Cabibbo-favored (S = −2) decays — relative to $\Xi^- \pi^+$		
$p K^- K^- \pi^+$	0.34 ± 0.04	676
$p K^- \overline{K}^*(892)^0$	0.21 ± 0.05	413
$p K^- K^- \pi^+$ (no $\overline{K}^{*0}$)	0.21 ± 0.04	676
ΛK_S^0	0.210 ± 0.028	906
$\Lambda K^- \pi^+$	1.07 ± 0.14	856
$\Lambda \overline{K}^0 \pi^+ \pi^-$	seen	787
$\Lambda K^- \pi^+ \pi^+ \pi^-$	seen	703
$\Xi^- \pi^+$	**DEFINED AS 1**	875
$\Xi^- \pi^+ \pi^+ \pi^-$	3.3 ± 1.4	816
$\Omega^- K^+$	0.297 ± 0.024	522
$\Xi^- e^+ \nu_e$	3.1 ± 1.1	882
$\Xi^- \ell^+$ anything	1.0 ± 0.5	–
Cabibbo-suppressed decays — relative to $\Xi^- \pi^+$		
$\Xi^- K^+$	0.028 ± 0.006	790
$\Lambda K^+ K^-$ (no ϕ)	0.029 ± 0.007	648
$\Lambda \phi$	0.034 ± 0.007	621

$\Xi_c^{\prime +}$

$I(J^P) = \frac{1}{2}(\frac{1}{2}^+)$

J^P has not been measured; $\frac{1}{2}^+$ is the quark-model prediction.

Mass $m = 2575.6 \pm 3.1$ MeV
$m_{\Xi_c^{\prime +}} - m_{\Xi_c^+} = 107.8 \pm 3.0$ MeV

The $\Xi_c^{\prime +}$–Ξ_c^+ mass difference is too small for any strong decay to occur.

$\Xi_c^{\prime +}$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$\Xi_c^+ \gamma$	seen	106

$\Xi_c^{\prime 0}$

$I(J^P) = \frac{1}{2}(\frac{1}{2}^+)$

J^P has not been measured; $\frac{1}{2}^+$ is the quark-model prediction.

Mass $m = 2577.9 \pm 2.9$ MeV
$m_{\Xi_c^{\prime 0}} - m_{\Xi_c^0} = 107.0 \pm 2.9$ MeV

The $\Xi_c^{\prime 0} - \Xi_c^0$ mass difference is too small for any strong decay to occur.

$\Xi_c^{\prime 0}$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$\Xi_c^0 \gamma$	seen	105

$\Xi_c(2645)$

$I(J^P) = \frac{1}{2}(\frac{3}{2}^+)$

J^P has not been measured; $\frac{3}{2}^+$ is the quark-model prediction.

$\Xi_c(2645)^+$ mass $m = 2645.9^{+0.5}_{-0.6}$ MeV (S = 1.1)
$\Xi_c(2645)^0$ mass $m = 2645.9 \pm 0.5$ MeV
$m_{\Xi_c(2645)^+} - m_{\Xi_c^0} = 175.0^{+0.8}_{-0.6}$ MeV (S = 1.2)
$m_{\Xi_c(2645)^0} - m_{\Xi_c^+} = 178.1 \pm 0.6$ MeV
$m_{\Xi_c(2645)^+} - m_{\Xi_c(2645)^0} = 0.0 \pm 0.5$ MeV
$\Xi_c(2645)^+$ full width $\Gamma <$ 3.1 MeV, CL = 90%
$\Xi_c(2645)^0$ full width $\Gamma <$ 5.5 MeV, CL = 90%

$\Xi_c \pi$ is the only strong decay allowed to a Ξ_c resonance having this mass.

Ξ_c(2645) DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$\Xi_c^0 \pi^+$	seen	102
$\Xi_c^+ \pi^-$	seen	107

$\Xi_c(2790)$

$I(J^P) = \frac{1}{2}(\frac{1}{2}^-)$

J^P has not been measured; $\frac{1}{2}^-$ is the quark-model prediction.

$\Xi_c(2790)^+$ mass $= 2789.1 \pm 3.2$ MeV
$\Xi_c(2790)^0$ mass $= 2791.8 \pm 3.3$ MeV
$m_{\Xi_c(2790)^+} - m_{\Xi_c^0} = 318.2 \pm 3.2$ MeV
$m_{\Xi_c(2790)^0} - m_{\Xi_c^+} = 324.0 \pm 3.3$ MeV
$\Xi_c(2790)^+$ width < 15 MeV, CL = 90%
$\Xi_c(2790)^0$ width < 12 MeV, CL = 90%

Ξ_c(2790) DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$\Xi'_c \pi$	seen	159

$\Xi_c(2815)$

$I(J^P) = \frac{1}{2}(\frac{3}{2}^-)$

J^P has not been measured; $\frac{3}{2}^-$ is the quark-model prediction.

$\Xi_c(2815)^+$ mass $m = 2816.6 \pm 0.9$ MeV
$\Xi_c(2815)^0$ mass $m = 2819.6 \pm 1.2$ MeV
$m_{\Xi_c(2815)^+} - m_{\Xi_c^+} = 348.8 \pm 0.9$ MeV
$m_{\Xi_c(2815)^0} - m_{\Xi_c^0} = 348.7 \pm 1.2$ MeV
$m_{\Xi_c(2815)^+} - m_{\Xi_c(2815)^0} = -3.1 \pm 1.3$ MeV
$\Xi_c(2815)^+$ full width $\Gamma < 3.5$ MeV, CL = 90%
$\Xi_c(2815)^0$ full width $\Gamma < 6.5$ MeV, CL = 90%

The $\Xi_c \pi\pi$ modes are consistent with being entirely via $\Xi_c(2645)\pi$.

Ξ_c(2815) DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$\Xi_c^+ \pi^+ \pi^-$	seen	196
$\Xi_c^0 \pi^+ \pi^-$	seen	191

$\Xi_c(2980)$

$I(J^P) = \frac{1}{2}(?^?)$

$\Xi_c(2980)^+$ $m = 2971.4 \pm 3.3$ MeV (S = 2.1)
$\Xi_c(2980)^0$ $m = 2968.0 \pm 2.6$ MeV (S = 1.2)
$\Xi_c(2980)^+$ width $\Gamma = 26 \pm 7$ MeV (S = 1.5)
$\Xi_c(2980)^0$ width $\Gamma = 20 \pm 7$ MeV (S = 1.3)

$\Xi_c(2980)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$\Lambda_c^+ \overline{K} \pi$	seen	231
$\Sigma_c(2455) \overline{K}$	seen	134
$\Lambda_c^+ \overline{K}$	not seen	414
$\Xi_c 2\pi$	seen	–
$\Xi_c(2645) \pi$	seen	277

$\Xi_c(3080)$

$I(J^P) = \frac{1}{2}(?^?)$

$\Xi_c(3080)^+$ $m = 3077.0 \pm 0.4$ MeV
$\Xi_c(3080)^0$ $m = 3079.9 \pm 1.4$ MeV (S = 1.3)
$\Xi_c(3080)^+$ width $\Gamma = 5.8 \pm 1.0$ MeV
$\Xi_c(3080)^0$ width $\Gamma = 5.6 \pm 2.2$ MeV

$\Xi_c(3080)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$\Lambda_c^+ \overline{K} \pi$	seen	415
$\Sigma_c(2455) \overline{K}$	seen	342
$\Sigma_c(2455) \overline{K} + \Sigma_c(2520) \overline{K}$	seen	–
$\Lambda_c^+ \overline{K}$	not seen	536
$\Lambda_c^+ \overline{K} \pi^+ \pi^-$	not seen	143

Ω_c^0

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

J^P has not been measured; $\frac{1}{2}^+$ is the quark-model prediction.

Mass $m = 2695.2 \pm 1.7$ MeV (S = 1.3)
Mean life $\tau = (69 \pm 12) \times 10^{-15}$ s
$c\tau = 21$ μm

No absolute branching fractions have been measured.

Ω_c^0 DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$\Sigma^+ K^- K^- \pi^+$	seen	689
$\Xi^0 K^- \pi^+$	seen	901
$\Xi^- K^- \pi^+ \pi^+$	seen	830
$\Omega^- e^+ \nu_e$	seen	829
$\Omega^- \pi^+$	seen	821
$\Omega^- \pi^+ \pi^0$	seen	797
$\Omega^- \pi^- \pi^+ \pi^+$	seen	753

$\Omega_c(2770)^0$

$I(J^P) = 0(\frac{3}{2}^+)$

J^P has not been measured; $\frac{3}{2}^+$ is the quark-model prediction.

Mass $m = 2765.9 \pm 2.0$ MeV (S = 1.2)

$m_{\Omega_c(2770)^0} - m_{\Omega_c^0} = 70.7^{+0.8}_{-0.9}$ MeV

The $\Omega_c(2770)^0$–Ω_c^0 mass difference is too small for any strong decay to occur.

$\Omega_c(2770)^0$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$\Omega_c^0 \gamma$	presumably 100%	70

NOTES

[a] See the note on "Λ_c^+ Branching Fractions" in the Λ_c^+ Particle Listings.

[b] This branching fraction includes all the decay modes of the final-state resonance.

[c] An ℓ indicates an e or a μ mode, not a sum over these modes.

[d] The value is for the sum of the charge states or particle/antiparticle states indicated.

[e] Assuming isospin conservation, so that the other third is $\Lambda_c^+ \pi^0 \pi^0$.

[f] A test that the isospin is indeed 0, so that the particle is indeed a Λ_c^+.