



$$I(J^P) = ?(?^?) \quad \text{Status: } ***$$

Ξ_{cc}^{++} MASS

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
$3621.55 \pm 0.23 \pm 0.30$	2k	¹ AAIJ	20J LHCb	pp at 13 TeV
●●● We do not use the following data for averages, fits, limits, etc. ●●●				
$3620.6 \pm 1.5 \pm 0.4 \pm 0.3$	91	² AAIJ	18BA LHCb	pp at 13 TeV
$3621.40 \pm 0.72 \pm 0.27 \pm 0.14$	313	³ AAIJ	17BC LHCb	pp at 13 TeV

¹ AAIJ 20J combines mass measurements $3621.53 \pm 0.24 \pm 0.29$ MeV from $\Xi_{cc}^{++} \rightarrow \Lambda_c^+ K^- \pi^+ \pi^+$ and $3621.95 \pm 0.60 \pm 0.49$ MeV from $\Xi_{cc}^{++} \rightarrow \Xi_c^+ \pi^+$. Supersedes AAIJ 18BA and AAIJ 17BC.

² The third error in AAIJ 18BA value is from the uncertainty of the Ξ_c^+ mass.

³ The third error in AAIJ 17BC value is from the uncertainty of the Λ_c^+ mass. The width of the signal is 6.6 ± 0.8 MeV, consistent with the experimental resolution.

Ξ_{cc}^{++} MEAN LIFE

VALUE (10^{-15} s)	EVTS	DOCUMENT ID	TECN	COMMENT
$256_{-22}^{+24} \pm 14$	304	AAIJ	18G LHCb	pp at 13 TeV

Ξ_{cc}^{++} DECAY MODES

Mode	Fraction (Γ_i/Γ)	Confidence level
Γ_1 $\Lambda_c^+ K^- \pi^+ \pi^+$	DEFINED AS 1	
Γ_2 $\Xi_c^+ \pi^+, \Xi_c^+ \rightarrow p K^- \pi^+$	0.0022 ± 0.0006	
Γ_3 $\Xi_c^+ \pi^+, \Xi_c^+ \rightarrow \Xi_c^+ \gamma, \Xi_c^+ \rightarrow p K^- \pi^+$	0.0031 ± 0.0010	
Γ_4 $\Xi_c^0 \pi^+ \pi^+, \Xi_c^0 \rightarrow p K^- K^- \pi^+$	0.0067 ± 0.0010	
Γ_5 $D^+ p K^- \pi^+$	< 0.017	90%

$\Gamma(\Lambda_c^+ K^- \pi^+ \pi^+)/\Gamma_{\text{total}}$ Γ_1/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
seen	AAIJ	17BC LHCb	12 std significance

$\Gamma(\Xi_c^+ \pi^+, \Xi_c^+ \rightarrow p K^- \pi^+)/\Gamma_{\text{total}}$ Γ_2/Γ

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
seen	91	AAIJ	18BA LHCb	5.9 std significance

$$\Gamma(\Xi_c^+ \pi^+, \Xi_c^+ \rightarrow p K^- \pi^+) / \Gamma(\Lambda_c^+ K^- \pi^+ \pi^+) \quad \Gamma_2 / \Gamma_1$$

VALUE (units 10^{-3})	DOCUMENT ID	TECN	COMMENT
$2.2 \pm 0.6 \pm 0.1$	¹ AAIJ	18BA LHCb	Ratio 91 over 289 events

¹ AAIJ 18BA reports $[\Gamma(\Xi_{cc}^{++} \rightarrow \Xi_c^+ \pi^+, \Xi_c^+ \rightarrow p K^- \pi^+) / \Gamma(\Xi_{cc}^{++} \rightarrow \Lambda_c^+ K^- \pi^+ \pi^+)] / [B(\Lambda_c^+ \rightarrow p K^- \pi^+)] = (3.5 \pm 0.9 \pm 0.3) \times 10^{-2}$ which we multiply by our best (shown rounded) value $B(\Lambda_c^+ \rightarrow p K^- \pi^+) = (6.37 \pm 0.21) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value.

$$\Gamma(\Xi_c'^+ \pi^+, \Xi_c'^+ \rightarrow \Xi_c^+ \gamma, \Xi_c^+ \rightarrow p K^- \pi^+) / \Gamma(\Xi_c^+ \pi^+, \Xi_c^+ \rightarrow p K^- \pi^+) \quad \Gamma_3 / \Gamma_2$$

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
$1.41 \pm 0.17 \pm 0.10$	756	¹ AAIJ	22G LHCb	pp at 13 TeV

¹ The photon in the $\Xi_c'^+ \rightarrow \Xi_c^+ \gamma$ process is not reconstructed. Analysis uses two disjoint subsamples triggered on and independently from the signal.

$$\Gamma(\Xi_c^0 \pi^+ \pi^+, \Xi_c^0 \rightarrow p K^- K^- \pi^+) / \Gamma(\Lambda_c^+ K^- \pi^+ \pi^+) \quad \Gamma_4 / \Gamma_1$$

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT
$6.7 \pm 1.0 \pm 0.2$	83	¹ AAIJ	25AO LHCb	pp at 13 TeV

¹ AAIJ 25AO reports $[\Gamma(\Xi_{cc}^{++} \rightarrow \Xi_c^0 \pi^+ \pi^+, \Xi_c^0 \rightarrow p K^- K^- \pi^+) / \Gamma(\Xi_{cc}^{++} \rightarrow \Lambda_c^+ K^- \pi^+ \pi^+)] / [B(\Lambda_c^+ \rightarrow p K^- \pi^+)] = 0.105 \pm 0.014 \pm 0.007$ which we multiply by our best (shown rounded) value $B(\Lambda_c^+ \rightarrow p K^- \pi^+) = (6.37 \pm 0.21) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best (shown rounded) value. Dividing further by the less well-known value for $B(\Xi_c^0 \rightarrow p K^- K^- \pi^+) = (0.49 \pm 0.10) \times 10^{-2}$, AAIJ 25AO reports $B(\Xi_{cc}^{++} \rightarrow \Xi_c^0 \pi^+ \pi^+) / B(\Xi_{cc}^{++} \rightarrow \Lambda_c^+ K^- \pi^+ \pi^+) = 1.37 \pm 0.18 \pm 0.09 \pm 0.35$ in which the third uncertainty is from the external branching fractions.

$$\Gamma(D^+ p K^- \pi^+) / \Gamma(\Lambda_c^+ K^- \pi^+ \pi^+) \quad \Gamma_5 / \Gamma_1$$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$< 1.7 \times 10^{-2}$	90	AAIJ	19AO LHCb	pp at 13 TeV

Ξ_{cc}^{++} REFERENCES

AAIJ	25AO JHEP 2510 136	R. Aaij <i>et al.</i>	(LHCb Collab.)
AAIJ	22G JHEP 2205 038	R. Aaij <i>et al.</i>	(LHCb Collab.)
AAIJ	20J JHEP 2002 049	R. Aaij <i>et al.</i>	(LHCb Collab.)
AAIJ	19AO JHEP 1910 124	R. Aaij <i>et al.</i>	(LHCb Collab.)
AAIJ	18BA PRL 121 162002	R. Aaij <i>et al.</i>	(LHCb Collab.)
AAIJ	18G PRL 121 052002	R. Aaij <i>et al.</i>	(LHCb Collab.)
AAIJ	17BC PRL 119 112001	R. Aaij <i>et al.</i>	(LHCb Collab.)