



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

Ξ_{cc}^{++} MASS

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
3621.55 ± 0.23 ± 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 ± 1.5 ± 0.4 ± 0.3	91	² AAIJ	18BA LHCb	pp at 13 TeV
3621.40 ± 0.72 ± 0.27 ± 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⁺²⁴₋₂₂ ± 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 $D^+ p K^- \pi^+$	< 0.017	90%

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

VALUE	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
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
• • • We do not use the following data for averages, fits, limits, etc. • • •				
seen	91	AAIJ	18BA LHCb	5.9 std significance

$\Gamma(\Xi_c^+ \pi^+, \Xi_c^+ \rightarrow p K^- \pi^+) / \Gamma(\Lambda_c^+ K^- \pi^+ \pi^+)$ Γ_2 / Γ_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 value $B(\Lambda_c^+ \rightarrow p K^- \pi^+) = (6.26 \pm 0.29) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

$\Gamma(\Xi_c^{'+} \pi^+, \Xi_c^{'+} \rightarrow \Xi_c^+ \gamma, \Xi_c^+ \rightarrow p K^- \pi^+) / \Gamma(\Xi_c^+ \pi^+, \Xi_c^+ \rightarrow p K^- \pi^+)$ Γ_3 / Γ_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.

$\Gamma(D^+ p K^- \pi^+) / \Gamma(\Lambda_c^+ K^- \pi^+ \pi^+)$ Γ_4 / Γ_1

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

Ξ_{cc}^{++} REFERENCES

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.)