



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

### $\Xi_{cc}^{++}$ MASS

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
<b>3621.55 ± 0.23 ± 0.30</b>	2k	<sup>1</sup> 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	<sup>2</sup> AAIJ	18BA LHCb	$pp$ at 13 TeV
3621.40 ± 0.72 ± 0.27 ± 0.14	313	<sup>3</sup> AAIJ	17BC LHCb	$pp$ at 13 TeV

<sup>1</sup> 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.

<sup>2</sup> The third error in AAIJ 18BA value is from the uncertainty of the  $\Xi_c^+$  mass.

<sup>3</sup> The third error in AAIJ 17BC value is from the uncertainty of the  $\Lambda_c^+$  mass. The width of the signal is  $6.6 \pm 0.8$  MeV, consistent with the experimental resolution.

### $\Xi_{cc}^{++}$ MEAN LIFE

VALUE ( $10^{-15}$ s)	EVTS	DOCUMENT ID	TECN	COMMENT
<b>256<sup>+24</sup><sub>-22</sub> ± 14</b>	304	AAIJ	18G LHCb	$pp$ at 13 TeV

### $\Xi_{cc}^{++}$ DECAY MODES

Mode	Fraction ( $\Gamma_i/\Gamma$ )	Confidence level
$\Gamma_1$ $\Lambda_c^+ K^- \pi^+ \pi^+$	<b>DEFINED AS 1</b>	
$\Gamma_2$ $\Xi_c^+ \pi^+, \Xi_c^+ \rightarrow p K^- \pi^+$	$0.0022 \pm 0.0006$	
$\Gamma_3$ $\Xi_c^+ \pi^+, \Xi_c^+ \rightarrow \Xi_c^+ \gamma, \Xi_c^+ \rightarrow p K^- \pi^+$	$0.0031 \pm 0.0009$	
$\Gamma_4$ $D^+ p K^- \pi^+$	$< 0.017$	90%

### $\Gamma(\Lambda_c^+ K^- \pi^+ \pi^+)/\Gamma_{\text{total}}$ $\Gamma_1/\Gamma$

VALUE	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
seen	AAIJ	17BC LHCb	12 std significance

### $\Gamma(\Xi_c^+ \pi^+, \Xi_c^+ \rightarrow p K^- \pi^+)/\Gamma_{\text{total}}$ $\Gamma_2/\Gamma$

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

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

VALUE (units $10^{-3}$ )	DOCUMENT ID	TECN	COMMENT
<b><math>2.2 \pm 0.6 \pm 0.1</math></b>	<sup>1</sup> AAIJ	18BA LHCB	Ratio 91 over 289 events

<sup>1</sup> 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  $B(\Lambda_c^+ \rightarrow p K^- \pi^+) = (6.24 \pm 0.28) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

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

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b><math>1.41 \pm 0.17 \pm 0.10</math></b>	756	<sup>1</sup> AAIJ	22G LHCB	$pp$ at 13 TeV

<sup>1</sup> 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.

$$\Gamma(D^+ p K^- \pi^+) / \Gamma(\Lambda_c^+ K^- \pi^+ \pi^+) \quad \Gamma_4 / \Gamma_1$$

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
<b><math>&lt; 1.7 \times 10^{-2}</math></b>	90	AAIJ	19AO LHCB	$pp$ at 13 TeV

## $\Xi_{cc}^{++}$ 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.)