# Measurement of $\Xi_c^0$ in pp collisions at 13 TeV as a function of multiplicity and in p–Pb collisions at 5.02 TeV with ALICE

QM22 Poster Session 3 T11_4

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For the ALICE collaboration

# Motivation: charmed baryon production

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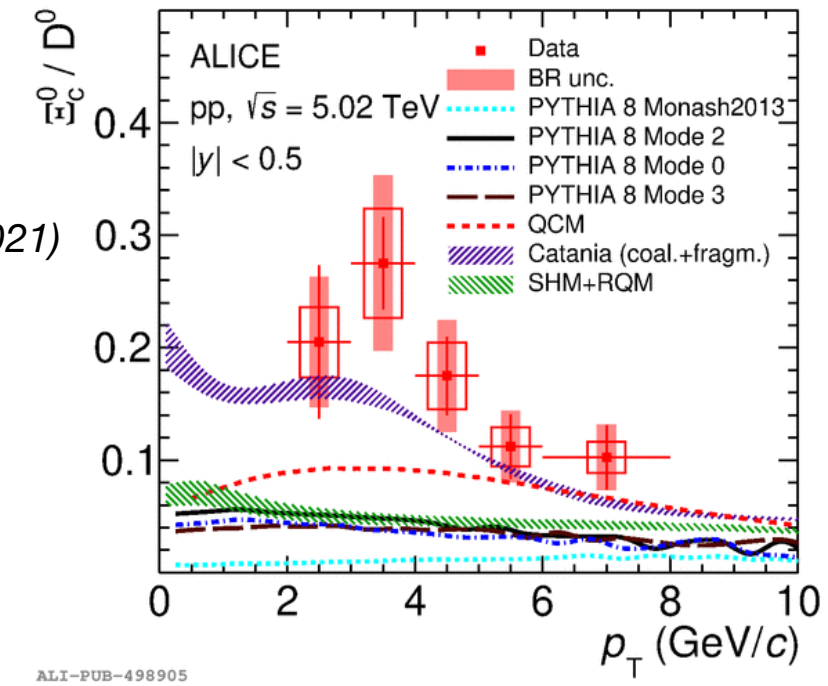


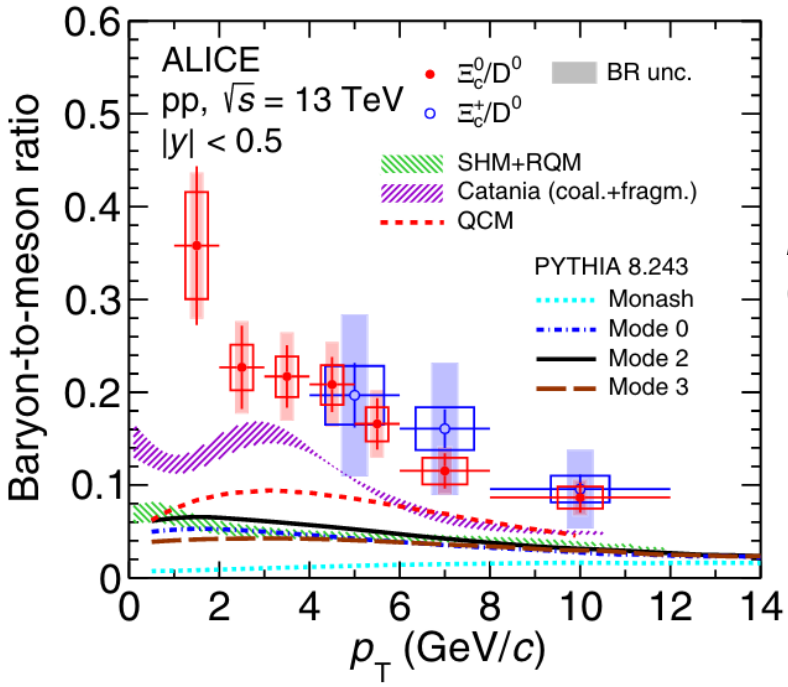


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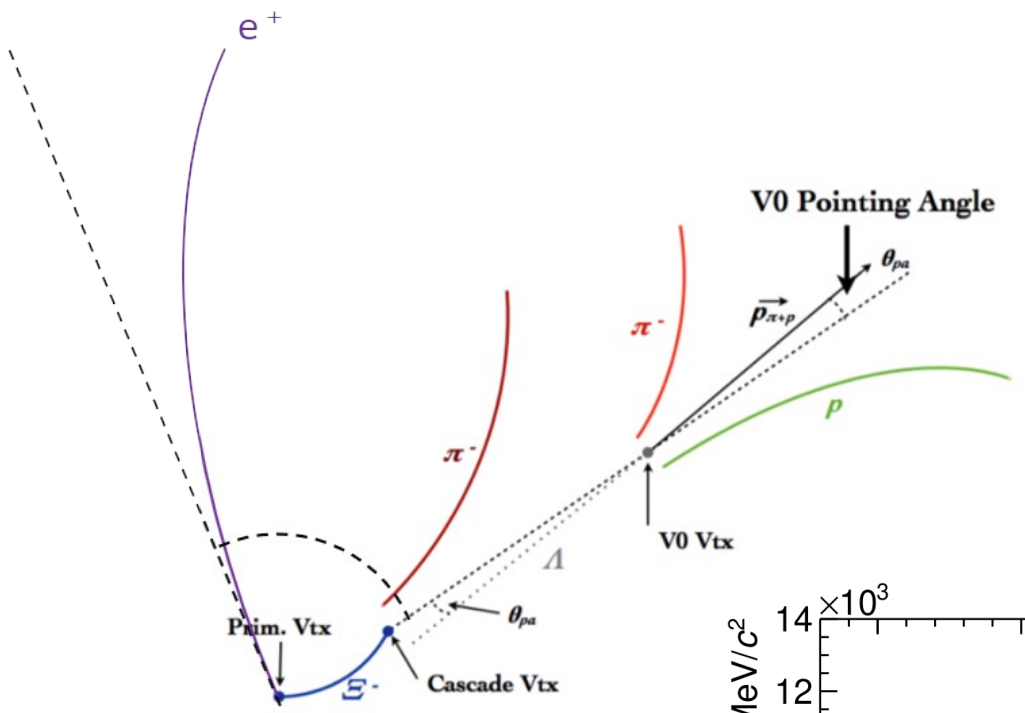
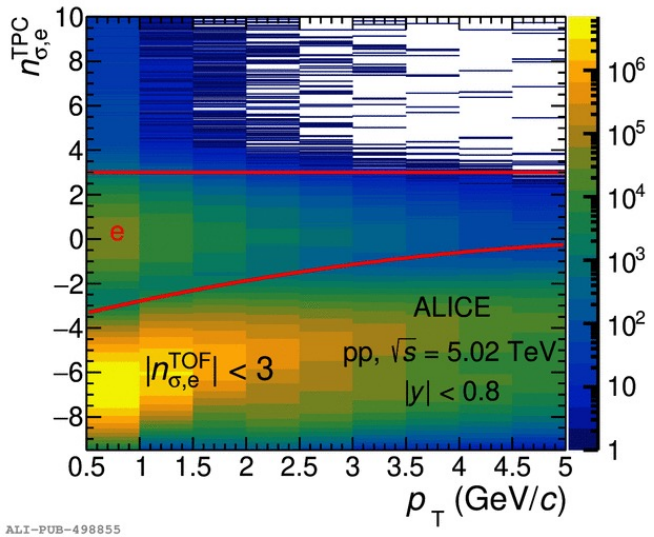
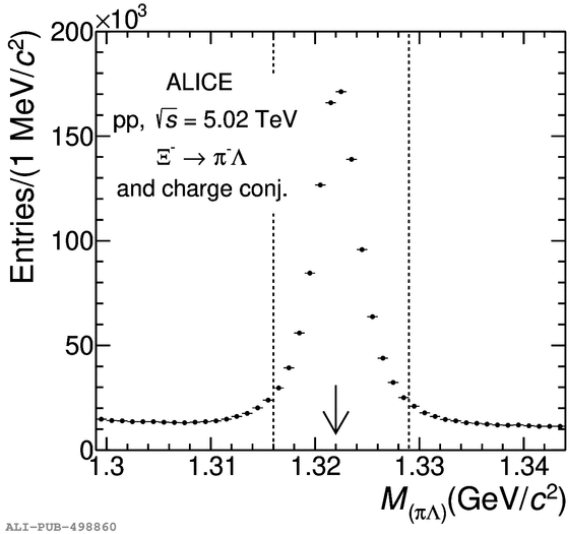
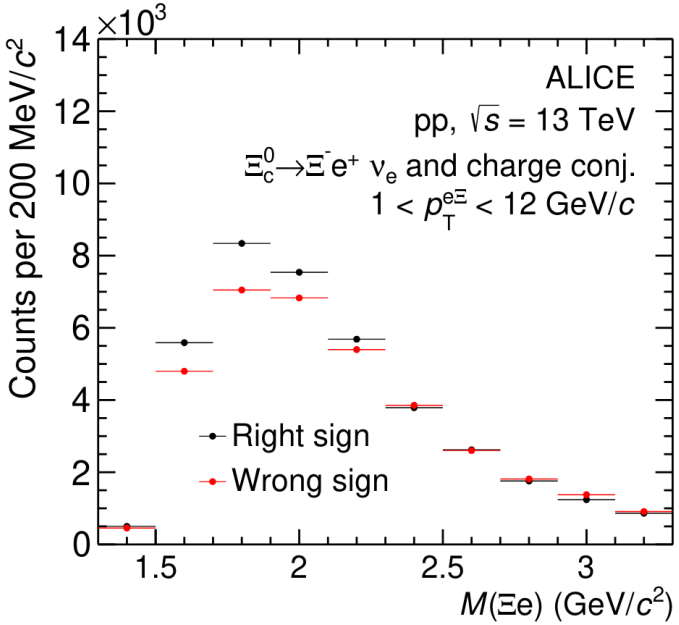
- Measurements of charmed baryon production are crucial to investigate the hadronisation mechanism of charm quarks.
- Recent result shows significant enhancement of baryon-to-meson ratio compared with the predictions from $e^+e^-$ collisions due to the modification of the charm fragmentation fractions
- Measurements in proton-nucleus collisions are important to separate the cold nuclear matter effect from the effects associated with the formation of quark-gluon plasma

# Analysis procedure



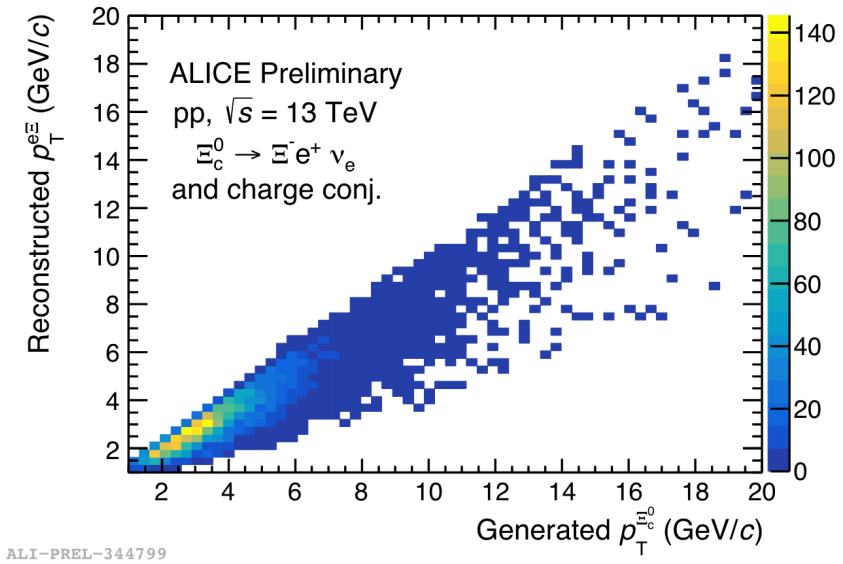



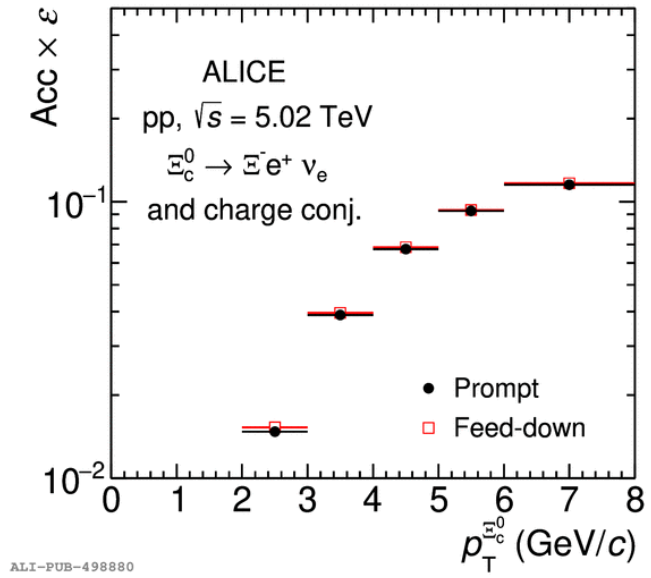




- Using semileptonic decay channel
  - $\Xi_c^0 \to e^+ \Xi^- \nu \to e^+ (\pi^- \Lambda) \nu \to e^+ (\pi p \pi) \nu$
- Select high purity samples of $e$ and $\Xi$
- Obtain distribution of $e\Xi$ pairs
  - RS (right sign = unlike-sign)
  - WS (wrong sign = like-sign)
  - Raw signal is : RS-WS

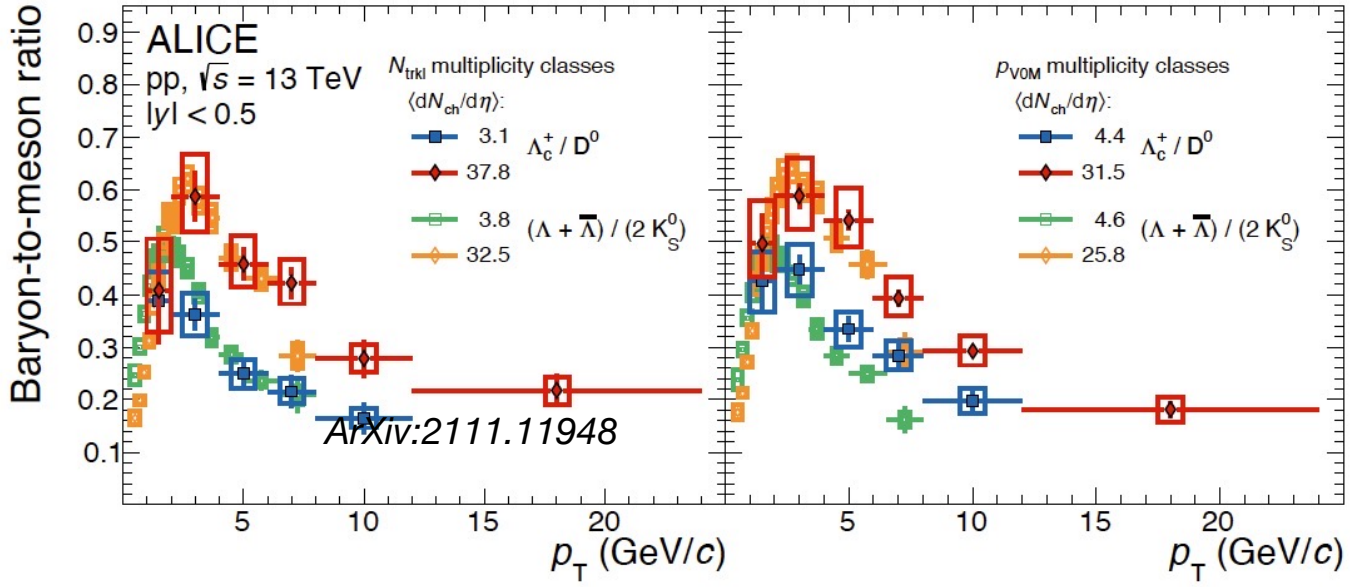
# Analysis procedure




- Reject electrons coming from gamma conversion in the material
- Over-subtraction correction for $\Xi_b \rightarrow e\Xi + X$
- Unfolding: convert from $e\Xi$ $p_T$ to $\Xi_c^0$ $p_T$
- Acceptance and reconstruction efficiency correction
- Normalization with the integrated luminosity

# $\Xi_c^0$ production in high multiplicity pp and in p-Pb collisions




- Integrated Luminosity collected using the ALICE detector related to ongoing $\Xi_c^0$ analyses
  - pp 13 TeV MB trigger: 32nb$^{-1}$
  - pp 13 TeV HMV0 trigger: 7.7pb$^{-1}$
  - p-Pb 5.02 TeV MB trigger: 0.3nb$^{-1}$

- Observation of a multiplicity dependence of the $\Lambda_c^+/D^0$ ratio in $1<p_T<12$ GeV/c, and measurements in agreement with the $\Lambda/K^0_s$ measured in similar multiplicity intervals.
  - Significant increase in charmed baryon/meson ratio at high multiplicity in the measured $p_T$ range
- Therefore, further study on the multiplicity dependence of the baryon-to-meson yield ratios, especially $\Xi_c^0$ can provide additional information on how the charm hadronisation process evolves
- Analysis using pp 13 TeV dataset via the semileptonic decay channel is ongoing
- Also, analysis using p-Pb 5.02 TeV dataset via the semileptonic decay channel is ongoing,
  - Measurements in proton-nucleus collisions are important to separate the cold nuclear matter effect from the effects associated with the formation of quark-gluon plasma