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Multiplicity dependence of Ξ_c^+ baryon production in pp collisions at \sqrt{s} = 13 TeV with ALICE

Tuesday 25 April 2023 16:20 (20 minutes)

Recent measurements of the baryon-to-meson production yield ratios between charm baryons (Λ_c^+ , $\Sigma_c^{0,++}$, $\Xi_c^{0,+}$, Ω_c^0) and D mesons (D⁰) in small collision systems show a significant enhancement with respect to the measurements performed in e^+e^- collisions. These results were compared with various models implementing a modified hadronization of charm quarks in hadronic collisions, which enhance the production of baryons. The models can describe the measurements of Λ_c^+ and $\Sigma_c^{0,++}$, that don't contain the strange quark, but the description of $\Xi_c^{0,+}$ and Ω_c^0 measurements, which contain both charm and strange quarks, is still challenging. Therefore further investigation is needed to unveil the hadronization of $\Xi_c^{0,+}$ and Ω_c^0 .

The multiplicity dependence of Ξ_c^+ production will be studied, reconstructing the Ξ_c^+ via the hadronic decay channel $\Xi_c^+ \rightarrow \Xi^- \pi^+ \pi^+$ at midrapidity in pp collisions at \sqrt{s} = 13 TeV.

In this poster, the invariant-mass distributions of Ξ_c^+ in different multiplicity bins using minimum bias and high multiplicity triggered data recorded by the ALICE detector will be shown.

The yield extraction procedure, using a machine learning model based on Boosted Decision Tree algorithms, will be briefly introduced as well.

Furthermore, the strategy for the measurement of the Ξ_c^+ production cross section as a function of multiplicity will be discussed.

Theory / experiment

Experiment

Group or collaboration name

ALICE

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