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

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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 (D^0) 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 a strange quark.
However, the models cannot provide an accurate description for the $\Xi_c^{0,+}$ and Ω_c^0 measurements, which contain both charm and strange quarks, even though the models which include hadronization via both coalescence and fragmentation show the similar trends in baryon-to-meson production yield ratios obtained from the data. Therefore, further investigation are needed to unveil the hadronization of charm quarks.

The ALICE Collaboration also measured the Λ_c^+ baryons as a function of charged particles multiplicity in pp collisions at $\sqrt{s}$ = 13 TeV. In this measurement, the production yield ratios between Λ_c^+ and D^0 show a remarkable dependence on multiplicity.
Similar measurements of $\Xi_c^{0,+}$ as a function of the charged particles multiplicity are expected to provide additional constraints for modeling the hadronization mechanism of charm quarks.

In this poster, the measurement of Ξ_c^+ for several charged particles multiplicity classes, reconstructed via the hadronic decay channel $\Xi_c^+ \rightarrow \Xi^- \pi^+ \pi^+$ at midrapidity in pp collisions, will be shown. The results were obtained for pp collisions at $\sqrt{s}$ = 13 TeV, using minimum bias and high-multiplicity triggered data recorded by the ALICE detector.

Category

Experiment

Collaboration (if applicable)

ALICE

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