

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

mardi 4 juin 2024 19:55 (1 minute)

Ratios of production yields of different charm hadron species are a sensitive observable to study the hadronization process.

Recently, the ALICE Collaboration reported the production yield of charm baryons (Λ_c^+ , $\Sigma_c^{0,++}$, $\Xi_c^{0,+}$, Ω_c^0) relative to that of D mesons in proton–proton collisions.

The measured baryon-to-meson ratios show significant enhancement compared to those measured in e^+e^- collisions, implying that the hadronization process of charm quark is not universal across the different collision systems.

Various models implementing a modified hadronization of charm quarks in hadronic collisions, which enhance the production of baryons, can describe these enhancements of Λ_c^+ and $\Sigma_c^{0,++}$ which do not include strange quark.

These models predict a similar behaviour for charm baryons with strange-quark content ($\Xi_c^{0,+}$ and Ω_c^0), however they still cannot quantitatively describe the experimental results.

Therefore, more differential measurements, such as a function of charged-particle multiplicity, need to be provided to understand the hadronization process of charm quarks.

The ALICE Collaboration also performed a measurement of Λ_c^+ baryon production as a function of charged-particle multiplicity in pp collisions at $\sqrt{s} = 13$ TeV.

The measured production yield ratio Λ_c^+/D^0 shows a remarkable modification of the p_T dependence as a function of the charged-particle multiplicity.

A similar measurements for $\Xi_c^{0,+}$ is expected to provide further constraints for understanding the hadronization process of charm quarks.

In this contribution, the production yield of Ξ_c^+ baryons as a function of charged-particle multiplicity at midrapidity in pp collisions at $\sqrt{s} = 13$ TeV will be shown.

Both minimum-bias and high-multiplicity triggered pp collisions collected by the ALICE detector during the LHC Run 2 data taking period were exploited.

The Ξ_c^+ baryon was reconstructed via its hadronic decay channel, $\Xi_c^+ \rightarrow \Xi^- \pi^+ \pi^+$. The production yield ratio between Ξ_c^+ baryons and D^0 mesons as a function of charged-particle multiplicity will be presented as well.

Auteur principal: CHO, JaeYoon (Inha University)

Orateur: CHO, JaeYoon (Inha University)

Classification de Session: Posters

Classification de thématique: Heavy-Flavours & Quarkonia