

Hadronisation of heavy quarks in small systems with ALICE at the LHC

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The production cross section of charm hadrons in hadronic collisions can be calculated using the factorisation approach as a convolution of three factors: the parton distribution functions (PDFs), the hard-scattering cross section at the partonic level, and the fragmentation functions of the produced heavy quarks into given species of heavy-flavour hadrons, which is assumed to be universal for different collision systems. However, recent observations of enhanced baryon-to-meson production yield ratios in hadronic collisions, with respect to the same measurements performed in e^+e^- or e^-p collisions, suggest that the charm fragmentation fractions are not universal and depend on the collision system.

In this contribution, we present the measurements of D^0 , D^+ and D_s^+ meson production, together with those of Λ_c^+ , $\Sigma_c^{0,++}$, $\Xi_c^{0,+}$ baryons, as well as the first result for Ω_c^0 -baryon production at midrapidity in pp collisions at $\sqrt{s} = 13$ TeV with ALICE. These measurements confirm that the baryon-to-meson yield ratios in hadronic collisions are significantly larger than those measured in e^+e^- collisions, and are compared with different predictions assuming either in-vacuum fragmentation or modified hadronisation mechanisms for hadronic collisions.

Furthermore, the first measurement of the nuclear modification factor R_{pPb} for prompt Ξ_c^0 baryons and non-prompt D^0 mesons at $\sqrt{s_{NN}} = 5.02$ TeV will be shown. In p-Pb collisions, they provide important information about the cold nuclear matter (CNM) effects and help us understand how the possible presence of collectivity could influence the production of heavy-flavour hadrons. Finally, the measured charm fragmentation fractions and $c\bar{c}$ production cross section at midrapidity in pp collisions at $\sqrt{s_{NN}} = 5.02$ TeV will be reported.

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Classifica Sessioni: Hadron decays, production and interaction

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