

Studies of beauty-quark production, hadronisation and cold nuclear matter effects in pp and p-Pb collisions with ALICE

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Measurements of beauty-hadron production in ultrarelativistic hadronic collisions provide a fundamental tool for testing perturbative QCD calculations. Recent results at the LHC show that the beauty fragmentation function, as well as that of charm, is not universal across different collision systems. An extension of these studies to further energies, rapidities and collision systems has thus become crucial. Additionally, studies in p-Pb collisions allow us to shed light on the role of cold nuclear matter effects on beauty production and their impact on beauty-quark hadronisation. The ALICE experiment investigates the beauty sector via high-precision measurements of non-prompt D mesons and Λ_c^+ baryons, and via the measurement of leptons from beauty-hadron decays.

In this presentation, the first studies of non-prompt/prompt production-yield ratios of charm hadrons in pp collisions at $\sqrt{s} = 13.6$ TeV from the LHC Run 3 data taking are reported. Moreover, the final results on non-prompt charm baryon-over-meson and meson-over-meson production yield ratios in pp collisions at $\sqrt{s} = 13$ TeV and in p-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV are shown, as well as the nuclear modification factor of non-prompt D mesons and Λ_c^+ baryons in p-Pb collisions. The total $b\bar{b}$ production cross section at midrapidity in pp collisions is also presented. Finally, recent results on electrons from beauty-hadron decays are discussed.

Category

Experiment

Collaboration

ALICE

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