

Charm baryon production in pp, p-Pb and Pb-Pb collisions with ALICE at the LHC

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Charm quarks are a powerful probe of the Quark-Gluon Plasma (QGP) created in high-energy heavy-ion collisions. They are produced in hard scattering processes on a timescale shorter than the QGP formation time and experience the whole system evolution. There have been extensive researches regarding the production of charm mesons, such as D^0 , D^+D^+ , D^{*+} , in heavy-ion collisions to investigate the interactions of charm quarks with the QGP constituents and the transport properties of the medium. The measurement of charm-baryon production, and in particular the baryon-to-meson ratios, provide unique information on hadronisation mechanisms, constraining the role of coalescence and testing the predicted presence of diquark states in the QGP.

Measurements of charm-baryon production in pp and p-Pb collisions are also essential to establish a baseline for Pb-Pb collisions. The measurements in pp collisions provide critical tests of pQCD calculations and models of charm hadronisation in vacuum; the measurements in p-Pb collisions are useful to study cold nuclear matter effects and the possible evolution with charged-particle multiplicity of the modification of charm hadronisation.

In this talk, ALICE results of charm-baryon measurements in pp, p-Pb, and Pb-Pb collisions are presented. The p_T -differential cross sections of Λ_c^+ -baryon production in pp collisions at $\sqrt{s} = 7$ TeV and, for the first time, at $\sqrt{s} = 5.02$ TeV are reported, along with the results in p-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV. The p_T -differential cross section times branching ratio of the Ξ_c^0 baryon measured in the decay channel $\Xi_c^0 \rightarrow e^+ \Xi^- \nu_e$ in pp collisions is also discussed. Finally, the first measurement of the Λ_c^+ production in Pb-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV is shown.

Summary

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