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Investigating the fragmentation of charm quarks with correlation and jet measurements by ALICE

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Measurements of heavy-flavour tagged jets, and heavy-flavour particle azimuthal correlation with charged particles allow for comparisons of the heavy quarks (charm and beauty) production, propagation, and hadronization across different collision systems. Comparison of measurements performed in pp with p–Pb collisions can help studying the possible modification of the heavy-quark production and hadronization inside jets due to cold-nuclear-matter effects, while possible effects relative to the formation of the quark-gluon plasma can be studied by comparing measurements performed in pp and Pb–Pb collision systems. The measurement of heavy-flavour jets gives a direct access to the initial parton kinematics and can provide further constraints for heavy-quark energy loss models.

In this contribution, the measurement of azimuthal correlations between D-mesons and charged particles in pp collisions at $\sqrt{s} = 5.02$, 7, and 13 TeV, in p-Pb collisions at $\sqrt{s_{\rm NN}} = 5.02$ TeV and the azimuthal correlations between heavy-flavour decay electrons and charged particle in pp collisions at $\sqrt{s} = 5.02$ TeV are presented. The D-meson tagged jets measurements in pp at $\sqrt{s} = 5.02$, and 13 TeV, in p-Pb and Pb-Pb collision at $\sqrt{s_{\rm NN}} = 5.02$ TeV, and the measurements of the fragmentation function and radial shape of jets containing a Λ_c in pp collision at $\sqrt{s} = 13$ TeV with ALICE will be shown. The data are compared to simulations performed with different Monte Carlo event generators, which can help to investigating the heavy-quark production and hadronization processes. Finally, an evaluation of the performance for $\rm D^0 - D^0$ correlation studies based on a simulated analysis for ALICE˜3 will be presented.

Session

Heavy Ions and QCD

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