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D-tagged jet measurements in p-Pb collisions in ALICE

Heavy charm quarks are produced dominantly in the initial stage of high-energy heavy-ion collisions. They take part in the whole evolution of the medium, interact with the produced Quark-Gluon Plasma (QGP) and lose energy due to collisional and radiative processes. Therefore, they serve as unique probes of the QGP transport properties. Charm quarks can be studied by measuring D mesons that originate from the charm-quark fragmentation. Furthermore, identifying the charm-jets (with D-meson tagging) gives additional information about the energy-loss distribution in the medium. In order to disentangle effects related to the presence of the hot and dense medium, measurements in elementary pp and in p–A collisions are needed. In addition to the charm-jet transverse momentum spectrum, an important observable is the charm fragmentation function (fraction of the jet momentum carried by D mesons), which is still not fully understood even in pp collisions, and provides important constraint for Monte-Carlo event generators. The study of possible charm-jet modifications in p–Pb collisions is an important intermediate step between pp and Pb–Pb collisions that complements the simple pp vacuum case and the heavy-ion case with interplay of many different effects.

D mesons are identified via their hadronic decay channels using information from the ALICE Inner Tracking System to reconstruct decay topologies displaced with respect to the collision primary vertex. The ALICE Time Projection Chamber is used for the tracking and the hadron identification, the hadron selection being improved with the Time Of Flight detector. Charged jets containing D mesons are reconstructed with the anti-k_{T} algorithm.

In this poster, we will show the status of the D-tagged jets analysis in p–Pb minimum-bias collisions at $\sqrt{s_{\mathrm{NN}}}$ = 5.02 TeV. We will also present the prospects of the analysis with the new dataset to be gathered in the upcoming 2016 p–Pb run at $\sqrt{s_{\mathrm{NN}}}$ = 5.02 and 8 TeV. Both the charm-jet transverse momentum spectrum and the charm fragmentation function are studied.

Preferred Track

Open Heavy Flavors

Collaboration

ALICE

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