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Measurement of angular correlations between D mesons and charged particles in pp and p-Pb collisions with ALICE at the LHC

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ALICE (A Large Ion Collider Experiment) is designed and optimised for the study of heavy-ion collisions. The main objective of the ALICE physics programme is to study the Quark-Gluon Plasma (QGP), a strongly-interacting state of matter created at extremely high energy densities and temperatures in heavy-ion collisions. Heavy quarks (charm and beauty) are well suited probes of the QCD matter formed in high-energy nuclear collisions. They are produced in hard partonic scattering processes occurring in the initial stage of the collisions before the QGP is formed. So, they experience the full evolution of the medium and interact with its constituents.

The study of angular correlations between heavy-flavour particles and charged particles can give insight into the mechanisms through which heavy quarks lose energy and help to investigate possible modifications of their hadronisation induced by the presence of the medium. Such correlations in pp collisions serve as reference for nuclear collision systems and provide a testing ground for perturbative QCD calculations. Measurements in proton-lead (p-Pb) collisions are important to investigate cold nuclear matter effects such as the modification of parton densities in nuclei via shadowing or saturation, and k_T-broadening from multiple soft scatterings of partons, or parton energy loss in the initial and final state of the collisions.

In this contribution, the measurements of azimuthal correlations between D^0, D^+ and D^{*+} mesons and charged particles in pp collisions at $\sqrt{s}$ = 7 TeV and p-Pb collisions at $\sqrt{s}$ = 5.02 TeV will be presented along with comparisons with model predictions. D mesons were reconstructed from their hadronic decays in the central rapidity region and in the transverse momentum range $3 \leq p_T \leq 16$ GeV/c, and they were correlated to charged particles reconstructed in the pseudo-rapidity range $|\eta| < 0.8$. We will also discuss prospects of future measurements during Run II with ALICE at the LHC.

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