



ALICE determines the scattering parameters of D mesons with light-flavor hadrons

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The strong interaction among D mesons and light-flavor hadrons was completely out of experimental reach until recently. The scattering parameters governing elastic and inelastic D-pion/kaon/proton collisions are completely unknown. This poses strong limitations not only to the search of molecular states composed of charm and non-charm hadrons, but also to the study of the rescattering of charm mesons following their formation in ultrarelativistic heavy-ion collisions. In such collisions a colour-deconfined medium, quark-gluon plasma (QGP), is formed. The system experiences a hydrodynamic expansion cooling down up to the chemical freeze-out, which is followed by a hadronic phase. The knowledge of the scattering parameters of charm hadrons with non-charm hadrons would be a crucial ingredient for models based on charm-quark transport in a hydrodynamically expanding QGP to describe the typical observables of heavy-ion collisions.

In this talk we will report on the first estimation of the scattering parameters governing the strong interaction of the D-proton channel measured by the ALICE Collaboration in high-multiplicity pp collision at $s = 13$ TeV at the LHC. The strong interaction is studied by means of correlation in momentum space and the analysis is extended to D-kaon and D-pion combinations. It is demonstrated that all the relevant scattering parameters for the interaction of D mesons with light-flavor hadrons will be experimentally determined thanks to the upgrades of the ALICE experimental apparatus planned for the LHC Run 4 and 5 data taking periods.

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