

Studying the interaction between charm and light-flavor mesons with ALICE

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In the last years, several exotic hadrons have been observed in the charm sector; such particles cannot be interpreted as conventional baryons or mesons and are thought to be either quark bags or molecular states. To unveil their nature, it is crucial to experimentally constrain the strong force that governs the interaction between the charm hadrons and other hadrons, for instance, by measuring the scattering parameters. This knowledge is also essential for the study of ultrarelativistic heavy-ion collisions. In fact, during the hadronic phase of the system expansion, the charm hadrons can interact with the other particles produced in the collision via elastic and inelastic processes. These interactions modify the heavy-ion observables, and to disentangle this effect from the signatures of the quark-gluon plasma formation, the scattering parameters of the charm hadrons with light-flavor hadrons are required. This contribution presents the first experimental study of the final-state strong interaction between open-charm and light-flavor mesons. The measurement is performed using the femtoscopy method applied to high-multiplicity proton-proton collisions at $\sqrt{s} = 13$ TeV, collected by the ALICE Collaboration. The $D\pi$ and $D^*\pi$ scattering lengths are also determined for the first time. Additionally, predictions on femtoscopic results in the charm sector of the future ALICE 3 experiment are presented

Category

Experiment

Collaboration

ALICE

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