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Experimental study of the hadronic interactions in two- and three-body systems with ALICE at the LHC

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Understanding the dynamics of hadrons with different quark content is crucial to solve fundamental aspects of QCD as well as for the implications on the structure of dense stellar objects, such as neutron stars. The scarce statistics and lack of data in reactions for unstable hadrons, containing in particular strange and charm quarks, affect the accuracy of the current theoretical description of the corresponding strong interaction. Additionally, the modelling of nuclei and hypernuclei requires a precise knowledge of three-body forces, for which a direct measurement is still missing. In the past several years the use of correlation techniques, applied to particle pairs produced in high-energy collider experiments, have been proven capable of complementing and expanding our existing knowledge of the hadronic interactions, particularly in the strangeness sector.

The present contribution provides an overview of the milestones reached by the ALICE Collaboration using the femtoscopy technique in pp collisions at $\sqrt{s} = 13$ TeV. The main highlights are the unprecedented precision studies of the interaction of hadrons containing strange and charm quarks, alongside the extension of the analysis methods into the three-body sector aiming to experimentally isolate the three-body interaction contribution.

Primary author: DEL GRANDE, Raffaele (Technical University of Munich)

Presenter: DEL GRANDE, Raffaele (Technical University of Munich)

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