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Unprecedented precision studies of multi-strangeness hadronic interactions with ALICE at the LHC

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Understanding the dynamics of hadrons with strange 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. However, the current theoretical description of the interaction among hadrons with strangeness is strongly affected by the scarce statistics collected in traditional scattering experiments and by the limited data availability for hypernuclei. These limitations are particularly relevant for the study of dense nuclear matter.

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 the knowledge of hadronic interactions, especially in the strangeness sector. The present contribution provides an overview of the main milestones reached by the ALICE Collaboration using the femtoscopy technique in pp collisions at $\sqrt{s} = 13$ TeV. In particular, the latest results on the study of the interactions in four different strangeness systems, namely p-Λ ($S = -1$), p-Ξ^- ($S = -2$), Λ-Ξ^- and p-Ω^- ($S = -3$) will be presented and their interpretation in the context of the available theoretical predictions will be discussed.

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