

Investigation of the p- ϕ and p-D interaction in pp collisions at $\sqrt{s} = 13$ TeV with ALICE

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The study of the strong hadron-hadron interaction can be studied with high precision using two particle momentum correlations, as demonstrated by recent ALICE studies performed in pp collisions. This also includes hyperons (Y), for which the existing experimental uncertainties related to their two- and three-body interaction with nucleons (N) prohibits theoretical calculations to obtain firm conclusions on the nuclear equation of state (EoS). This has a direct consequence on the modeling and composition of neutron stars. In this context, the strong Y-Y interaction can be mediated by the ϕ meson within certain effective meson exchange models. This requires experimental input related to the N- ϕ and Y- ϕ systems. Additionally, understanding the N- ϕ interaction provides valuable input to interpret the signs of partial restoration of chiral symmetry in the nuclear medium. The latter can further be studied by means of the interaction between open charm hadrons and nucleons. An experimentally accessible system is the p-D, which has the benefit of also providing information regarding the nature of the newly observed heavy quarkonium-like states and charm pentaquarks. In this talk the first direct experimental investigation, using correlation techniques, of the N- ϕ and p-D systems will be presented. This has been achieved by the ALICE collaboration, using data from high-multiplicity pp collisions at $\sqrt{s} = 13$ TeV. These results are capable of providing new constraints to existing theoretical models.