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Shedding light on strong interactions in three-baryon systems with ALICE Run 3 data

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The interactions of Λ hyperons with nucleons are of high interest for the studies of the composition of the inner core of neutron stars. Their equation of state requires a precise knowledge of the two- and three-body interactions at small distances which are not yet well constrained by the existing experimental data. ALICE has introduced a novel approach to investigate such interactions by measuring femtoscopic correlation functions of particles emitted with distances of around 1 fm in high-energy pp collisions. This method allows the study of various hadron-nucleus pairs and, for the first time, direct access to the 3->3 free scattering process.

In this talk, ALICE measurements of p-d, p-p-p and p-p-Λ correlation functions are presented in pp collisions at √s = 13.6 TeV, with a sevenfold increase in the statistical sample compared to Run 2. Moreover, the first-ever measurement of Λ-d pairs in pp collisions will be presented. The measured correlation functions will be compared to theoretical predictions showing sensitivity to the three-body dynamics.

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