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Precision studies of the strong interaction in Λ-hadron systems up to $S = -3$ with ALICE

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The strong interaction among stable and unstable hadrons is a fundamental question in nuclear physics and a key ingredient for the description of the equation of state and the understanding of the structure of dense stellar objects such as neutron stars. Traditional measurements, including scattering and hypernuclei experiments, are insufficient to provide stringent constraints to the theoretical modeling of the interaction between hadrons containing strangeness. Two-particle correlation measurements are a prominent tool to probe the strong interaction with high precision even in the multi-strangeness sector. The ALICE Collaboration has demonstrated that high-multiplicity pp collisions are particularly well suited due to the enhanced production of strangeness in such collisions. Combined with the excellent tracking and particle identification capabilities of the ALICE detector, precision studies of the strong interaction among strange hadrons are feasible. The present contribution will discuss the latest ALICE results on the study of p-Λ ($S = -1$), Λ-K^- ($S = -2$) and Λ-Ξ^- ($S = -3$) interaction, which provide the most rigorous constraints in this field, and their interpretation in the context of the available theoretical predictions. The impact of these results on the equation of state of neutron stars is discussed.

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