Contribution ID: **14** Type: **Talk**

Constraining Hyperon-Nucleon and Hyperon-Hyperon interactions with femtoscopy in ALICE

Monday 2 September 2019 10:10 (35 minutes)

Pioneering studies by the ALICE Collaboration demonstrated the potential of employing femtoscopy to investigate and constrain hyperon-nucleon and hyperon-hyperon interactions with unprecedented precision. This kind of interaction is particularly interesting since it is closely connected to the physics of neutron stars. In particular, one of the plausible hypotheses about the content of neutron stars is that, in addition to neutrons, hyperons might be contained in the core. To obtain a better understanding of the composition of these objects, a detailed knowledge of the interactions between the constituents becomes mandatory. Such femtoscopic analyses are complementary to previous attempts to study the interaction with scattering experiments, which are difficult to perform due to the unstable nature of hyperon beams.

In this contribution, we present measurements from the ALICE Collaboration in pp collisions at $\sqrt{s}$ = 7 and 13 TeV and p–Pb collisions at $\sqrt{s_{NN}}$ = 5.02 TeV. The small size of the particle-emitting source in these collision systems is particularly well suited to study short-ranged strong potentials. The data samples collected by the ALICE experiment enable studies of the p-p, p-Λ and Λ-Λ correlations, and additionally make it possible to probe the interaction of more exotic pairs such as p-K, p-Ξ, p-Σ^0 and p-Ω. Newly developed analysis tools allow for a comparison of the measured correlation function between the particle pairs of interest to theory predictions using either potentials or wave functions as an input. This enables us to verify chiral and lattice calculations of the interaction and to constrain the corresponding scattering parameters.

Authors: MATHIS, Andreas (Technische Universität München (DE)); ALICE COLLABORATION, on behalf of the

Presenter: MATHIS, Andreas (Technische Universität München (DE))

Session Classification: Plenary Session 1 Monday

Track Classification: Plenary