

Strangeness in Quark Matter 2019



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Type: **Poster**

Femtoscopic studies on proton- Ξ^- and proton- Ω^- correlations in p-Pb and pp collisions with ALICE

Tuesday 11 June 2019 18:45 (2 hours)

Two-particle correlations can be used to probe the strong interaction between nucleons and multi-strange baryons. We will show measurements of correlation functions of proton- Ξ^- pairs in p-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV, and proton- Ω^- pairs produced in high-multiplicity pp collisions at $\sqrt{s} = 13$ TeV. Utilising newly developed femtoscopic techniques, we will demonstrate how these measurements can be compared to Lattice QCD and phenomenological model predictions for the strong potentials between protons and multi-strange baryons. Using the measured proton-proton correlation function to constrain the size and shape of the baryon-emitting source, and the excellent precision of the ALICE data, we will demonstrate that our measurements are highly discriminating with respect to these predictions. The measured proton- Ξ^- correlation function indicates the corresponding strong interaction is attractive, while the proton- Ω^- correlation function will be compared to models predicting a bound nucleon- Ω^- di-baryon state. A precise evaluation of these models of the nucleon-hyperon interaction is crucial for the modelling of the core of neutron stars. We will discuss the consequences of our measurements for the equation of state of neutron-rich matter including hyperons.

Collaboration name

ALICE Collaboration

Track

Strangeness in astrophysics

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