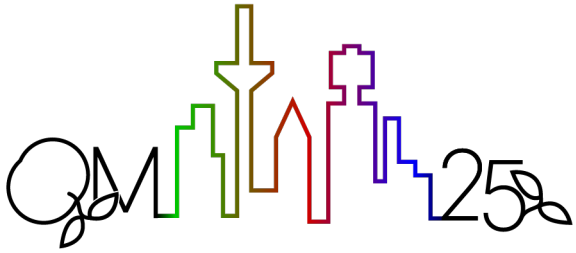

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Characterize Baryon Interactions with Bayesian Inference Analysis to Femtocopic Correlations

Understanding nucleon-nucleon (N-N) and hyperon-nucleon (Y-N) interactions is essential for exploring the structure of exotic nuclei and constraining the equation of state (EoS) of nuclear matter. These interactions offer insights into the behavior of baryonic matter under extreme conditions, which are relevant to both nuclear physics and astrophysics. By analyzing femtoscopic correlations of baryon pairs created in the heavy-ion collisions, one can derive valuable information regarding the size of the particle-emitting source and probe the characteristics of strong interactions. In recent years, Bayesian inference techniques have provided a comprehensive solution to efficiently study multi-parameter correlations in heavy-ion collisions.

In this talk, we present an application of Bayesian inference analysis to femtoscopic correlations in heavy-ion collisions. The analysis offers an efficient way to characterize the strong interactions between these particles, e.g. scattering length f_0 and effective range d_0 through the Lednick\'y-Lyuboshitz model. We validate the analysis framework through model simulations and apply the analysis to the experimental data at RHIC and LHC to obtain strong interaction parameters between baryon pairs. This analysis offers new insight into the understanding of baryon interactions.

Category

Theory

Collaboration (if applicable)

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