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Exploring Dynamic String Tension in a Transport Approach for System-Size Dependent Strangeness Production

Strangeness production is a key signature of the formation of a hot and dense medium in heavy-ion collisions. Understanding the production mechanisms across different system sizes remains a significant challenge in this field. Hybrid approaches, particularly those based on transport theory and hydrodynamics, such as the core-corona picture, have been successfully applied in previous studies.

Current and ongoing research utilizing the Lund string model within the Pythia8/Angantyr framework has taken a different approach to describe plasma-like signals, such as strangeness enhancement, through string interactions. This string framework does not assume a thermalized quark-gluon plasma and therefore serves as a valuable tool for investigating observables sensitive to collective behavior.

Inspired by the direction of string interactions, we employ the SMASH transport approach to examine whether a system size-dependent string tension can adequately describe experimental data on strangeness production. Additionally, we will explore potential methods for integrating medium-dependent string tension into SMASH.

While past efforts have incorporated a constant in-medium string tension in transport models, this study is the first to evaluate string tension dynamically based on local conditions. This approach allows us to further assess which observables necessitate the formation of a quark-gluon plasma and which can be described without this assumption.

Category

Theory

Collaboration (if applicable)

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