

WPCF 2023 - XVI Workshop on Particle Correlations and Femtoscopy & IV Resonance Workshop 2023



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Flow and hyperon polarization at RHIC BES from multi-fluid dynamics

Monday, 6 November 2023 18:00 (15 minutes)

We present a study of flow and hyperon polarization observables at RHIC BES energies in a MUlti Fluid simulation for Fast IoN collisions (MUFFIN) model. MUFFIN is based on a multi-fluid approach to relativistic heavy-ion collisions, and treats the initial stage of heavy-ion reaction as mutual inter-penetration of baryon-rich fluids. It is implemented from scratch with the use of a versatile 3+1 dimensional relativistic viscous hydrodynamic code vHLLE. The model is aimed at describing heavy-ion collision dynamics at lower RHIC BES energies, including the fixed-target mode, and energies of the future FAIR facility.

Global angular momentum and directed flow have the same prerequisites, which are baryon stopping and finite impact parameter. Therefore, we study them together. We discuss underlying vorticity development in multi-fluid approach, hyperon - anti-hyperon splitting, and compare our results to the recent data for hyperon polarization. We examine directed flow observable at different collision energies, and show its equation-of-state dependence and the effects of final-state hadronic cascade, in a full-fledged dynamical model.

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