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Anisotropic flow decorrelation in heavy-ion collisions at RHIC-BES energies with 3D event-by-event viscous hydrodynamics

Thursday 15 July 2021 15:30 (5 minutes)

In the RHIC Beam Energy Scan program, gold nuclei are collided with different collision energies in the range from few to 62.4 GeV. The goals of the program are to explore the onset of QGP creation, locate the critical point of QCD and study dense baryon matter.
In this talk, we report on the first application of 3D Monte Carlo Glauber (GLISSANDO2) and TrENTO p=0 initial states for 3D event-by-event viscous fluid dynamic (vHLLE) + cascade modelling of Au+Au collisions at $\sqrt{s_{\rm NN}} = 27$ and 62.4 GeV, which is the upper region of RHIC BES energies. The initial states are extended into both the longitudinal direction and for finite baryon density using simple ansätze. The full energy and baryon charge counting in the initial states is implemented. We show the reproduction of basic hadronic observables - pseudorapidity distributions of charged hadrons and net protons, transverse momentum spectra and elliptic flow, at both collision energies and with both initial states. We compare it to the existing results obtained with UrQMD initial state.
Furthermore, we show the results for rapidity decorrelation of elliptic flow r_2 at $\sqrt{s_{\rm NN}} = 27$ and 200 GeV from the same setup of hydrodynamic calculations with the 3D Monte Carlo Glauber and UrQMD initial states. We discuss the features of the initial states responsible for the magnitude of the observed flow decorrelation, and the effect of the final-state hadronic cascade.
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Preferred track

Collectivity & Multiple Scattering

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