

Effects of event-by-event hydrodynamic fluctuations in an integrated dynamical model

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The *hydrodynamic fluctuations* are thermal fluctuations arising in the event-by-event hydrodynamic evolution of the system, and they have effects on heavy-ion observables such as the higher harmonics v_n . To quantitatively determine the matter properties such as the shear viscosity and the relaxation times, it is needed to take into account the hydrodynamic fluctuations as well as the initial-state fluctuations.

The hydrodynamic fluctuations appear in the constitutive equation, and their power spectrum is determined by the fluctuation-dissipation relation. We implement the hydrodynamic fluctuations in our dynamical model consisting of the initialization models such as Monte-Carlo KLN model, causal dissipative hydrodynamics, and the subsequent hadronic cascades. By analyzing the hadron distributions obtained by massive event-by-event calculations with both of the hydrodynamic fluctuations and the initial-state fluctuations, we investigate the effects of the hydrodynamic fluctuations on the observables such as the higher harmonics.

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