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Evaluating the collective properties of heavy-ion collisions from microscopic dynamics using the PHSD model

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The hydrodynamic modeling of the system evolution in relativistic heavy-ion collisions has been very successful in describing the collective behavior observed experimentally. However, the matter created in such collisions is small in space scale and contains large fluctuation. Therefore the theoretical justification for the application of hydrodynamic approach is still an open question. In this work, we investigate how the hydrodynamic behaviors can appear in heavy-ion collisions using a microscopic model which is constructed without assuming hydrodynamics. The PHSD (Parton-Hadron-String Dynamics) is suitable for this purpose since it someway accounts for multiparticle effects through the mean field. From the behavior of the energy-momentum tensor in a local rest frame, we discuss the degree of the local thermal equilibrium in this model.

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