'Boltzmann-Langevin-One-Body': fluctuations and fragment formation in dissipative nucleon-nucleon collisions

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Résumé

Dissipative nucleus-nucleus collisions are a unique probe for the in-medium nuclear interaction at densities away from saturation and at high nucleon momenta; transport theories predict that this scenario can lead to processes characterised by volume instabilities and, consequently, to the production of several intermediate-mass fragments. The seeds of fragment formation are fluctuations. In this context, the study of a new strategy to solve the Boltzmann-Langevin equation is presented. As an extension of the Bauer-Bertsch approach, in the framework of semiclassical test-particle-based transport models, fluctuations of correct amplitude are introduced in phase space through a stochastic collision term. The resulting fluctuations have so large amplitude to induce bifurcations in the dynamical paths of the one-body phase-space density and they correlate over smaller volumes with respect to previous forms of the collision integral. In prospective, this strategy is promising for the improvement of transport models for nuclear collisions and for the implementation of isovector effects in the collision dynamics.

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