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Non-equilibrium effects and spherocity in relativistic proton-nucleus collisions

Tuesday, 7 November 2023 17:50 (25 minutes)

The experimental observations of quark-gluon plasma signals in proton-proton and proton-nucleus collisions at RHIC and LHC energies has attracted a big interest in these small systems due to the possible formation of short-lived droplets of this deconfined state of strongly interacting matter. We study the effects of nonequilibrium dynamics in relativistic proton-nucleus collisions by comparing a microscopic nonequilibrium transport approach, the Parton-Hadron-String-Dynamics (PHSD), with a macroscopic 2D+1 viscous hydrodynamical model, VISHNew. We analyse the medium evolution and properties through quantities like the energy density and the viscous corrections as well as by applying the event-shape engineering through the transverse spherocity. This observable is capable of classifying different final-state event topologies and may help to investigate particle production as well as collective flows in small systems.

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