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Do nuclear collisions create a locally equilibrated quark-gluon plasma?

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Experimental results on azimuthal correlations in high energy nuclear collisions (nucleus-nucleus, proton-nucleus and proton-proton) seem to be well described by viscous hydrodynamics. It is often argued that this agreement implies either local thermal equilibrium or at least local isotropy. In this note, I present arguments why this is not the case. Neither local near-equilibrium nor near-isotropy are required in order for hydrodynamics to offer a successful and accurate description of experimental results. However, I predict the breakdown of hydrodynamics at momenta of order twenty times the temperature, corresponding to a smallest possible QCD liquid drop size of 0.05 fm.

Preferred Track

Collective Dynamics

Collaboration

Not applicable

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