



Contribution ID: 322

Type: **Poster**

The anisotropic non-equilibrium hydrodynamic attractor

Tuesday, 15 May 2018 19:20 (20 minutes)

We determine the dynamical attractor associated with anisotropic hydrodynamics (aHydro) for a system undergoing Bjorken flow and compare our results to the corresponding attractor obtained from exact solution of the Boltzmann equation, Navier-Stokes theory, and two second-order viscous hydrodynamics theories (Mueller-Israel-Stewart and Denicol-Niemi-Molnar-Rischke). We demonstrate that the aHydro attractor is virtually indistinguishable from the exact attractor and show that the success of aHydro in reproducing the exact attractor solution stems from the fact that in this approach there is a resummation in both gradients (Knudsen number $-Kn$) and inverse Reynolds number (R_π^{-1}). This allows aHydro to be applied at much higher inverse Reynolds numbers than traditional hydrodynamic approaches. We close by discussing the implications for heavy-ion collision modeling.

Content type

Theory

Collaboration

Centralised submission by Collaboration

Presenter name already specified

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Session Classification: Poster Session

Track Classification: QCD at high temperature