Initial Stages 2021



Contribution ID: 160

Type: oral

The renormalization of sound and viscosity from non-equilibrium effective field theory

Monday 11 January 2021 17:45 (20 minutes)

In small colliding systems and near the QCD critical point, the effects due to hydrodynamic fluctuations can be significant. The effective field theory of fluctuating hydrodynamics has recently been formulated on the closed time path (Schwinger-Keldysh formalism) [1]. Such formulation allows for a systematic treatment of non-linear interaction among energy-momentum densities and hydrodynamics noise. We present the first complete leading order analysis of the effects of hydrodynamic fluctuations on stress-energy tensor correlations and show how those fluctuations modify the dispersion of sound and shear modes. We find the contributions of hydrodynamic fluctuations are parametrically more important than those from the second-order terms in hydrodynamics. We discuss the potential implications of our results for heavy-ion collision phenomenology [2].

M. Crossley, P. Glorioso, and H. Liu, Effective field theory of dissipative fluids, JHEP 1709 (2017) 09.
P.H.C. Lau, H. Liu and Y. Yin, in preparation.

Authors: LAU, Pak Hang (Massachusetts Institute of Technology); YIN, Yi (IMP); Prof. LIU, Hong (MIT)

Presenter: LAU, Pak Hang (Massachusetts Institute of Technology)

Session Classification: NT

Track Classification: New theoretical techniques at large and small coupling