

The 8th Asian Triangle Heavy-Ion Conference (ATHIC2021)



Contribution ID: 121

Type: not specified

MIS*: towards describing jet-medium response in the extended hydrodynamic regime

Sunday 7 November 2021 15:12 (17 minutes)

In the context of exploring the properties of QGP through jet-medium interaction, we consider the response of the near-equilibrium QCD-like theories to inhomogeneous energy/momentum disturbance. For both $N=4$ super-Yang Mills theory in strong coupling limit and kinetic equation under relaxation time approximation (RTA), we find that hydrodynamic modes continue dominating medium's response even in the region where Knudsen number is not small. However, in this extended hydrodynamic regime, neither the first-order nor second-order hydrodynamic equations describe the dispersion of hydrodynamic modes. We propose a simple yet not trivial extension of the Muller-Israel-Stewart theory, namely MIS. *We show that MIS* can quantitatively describe hydrodynamic modes in both hydrodynamic and extended hydrodynamic regimes with a suitable choice of model parameters for representative microscopic theories with and without quasi-particle descriptions. As an illustration, we apply MIS* to study how a Bjorken-expanding QGP responds to a moving energetic parton.

Primary authors: KE, Weiyao; YIN, Yi

Presenter: KE, Weiyao

Session Classification: Contributed Session 3

Track Classification: Track group 1: Theory