

Recent progresses in viscous hydrodynamics and the shear viscosity of the QGP

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One of the most important findings in the recent years at both Relativistic heavy ion collider (RHIC) and at Large Hadron Collider (LHC) is the existence of a strongly interacting almost perfect nuclear fluid which is produced in high energy heavy ion collision. Both Lattice QCD and string theoretical calculation of the transport properties of the QCD matter at high density and temperature shows that the ratio of shear viscosity to entropy density (η/s) of the QCD matter reaches a very low value which is believed to be the lowest among all known fluids. However, these theoretical calculations contain large uncertainties. One can also estimate the value of transport coefficients (shear, bulk viscosity) of QCD matter by means of phenomenological model studies, e.g. relativistic viscous hydrodynamics. However, the extracted value of η/s from viscous hydrodynamics relies on some strong assumption about the initial conditions as well as other input parameters used in the model. In this talk I will mainly focus on the recent progresses in the field of viscous hydrodynamics to extract the value of η/s from the experimental data. I will also discuss some open problems related to viscous hydrodynamics which immediately needs attention in order to precisely estimate the value of η/s from experimental data.

Keywords

QGP viscosity, relativistic hydrodynamics

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