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Typ: Talk

Early time dynamics far from equilibrium via holography

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We investigate the early time dynamics of heavy ion collisions studying the time evolution of the energy-momentum tensor as well as energy-momentum correlations within a uniformly thermalizing holographic QGP. From these quantities, we suggest a far-from equilibrium definition of shear viscosity, which is a crucial property of QCD matter as it significantly determines the generation of elliptic flow already at early times. During the the initial heating phase of the holographic QGP the shear viscosity of entropy density ratio decreases down to 60%, followed by an overshoot to 110% of the near-equilibrium value, $\eta/s = 1/(4\pi)$. Subsequently, we consider a holographic QGP which is Bjorken-expanding. Its energy-momentum tensor components are analytically shown to have a hydrodynamic attractor to which all time evolutions collapse independent of the initial conditions. Based on this, we propose a definition for a far from equilibrium speed of sound that governs the propagation of sound modes in the holographic QGP. Implications for the QCD QGP are discussed.

Experiment/Theory

Theory/Phenomenology

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Sitzung Einordnung: Parallel: Early-Time Dynamics & nPDFs

Track Klassifizierung: Early time dynamics and nuclear PDFs