

Holographic collisions in non-conformal theories

Tuesday 8 August 2017 17:00 (30 minutes)

We use the gauge/gravity duality to model the out-of-equilibrium first stage of a heavy ion collision through the collision of gravitational shockwaves in numerical relativity. This investigation of collisions of sheets of energy density in a non-conformal theory with a gravity dual is the first non-conformal holographic simulation of a heavy ion collision. I will discuss the new physics that arises (as compared to the much simpler conformal case) such as a new plasma relaxation channel, the equilibration of the conformal symmetry breaking scalar condensate and the presence of a sizeable bulk viscosity. These ingredients are crucial to make qualitative contact of the fast hydrodynamization process of hot plasmas with real-world QCD deconfinement matter above the critical point.

Summary

We numerically simulate gravitational shock wave collisions in a holographic model consisting of Einstein gravity coupled to a scalar field with a non-trivial potential.

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Session Classification: Parallel 3

Track Classification: Parallel Session