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Probes of thermalization and quarkonium dissociation in an equilibrating strongly interacting plasma

The evolution of a deconfined and strongly coupled plasma, from an initial anisotropic and far-from-equilibrium state to a hydrodynamic regime, is examined in a holographic framework. A distortion of the boundary metric (quench) is employed to drive the system in the initial configuration, which mimics the effects of heavy ion collisions producing QGP in experiments at RHIC and LHC. The relaxation process is analyzed monitoring the evolution of local and non-local probes: the stress-energy tensor, equal-time correlation functions and Wilson loops of different shapes. A hierarchy among the hydrodynamization times of the energy density, pressures and large probes emerges, supporting the picture of a top-down thermalization, a feature of strongly coupled theories. A holographic description of in-medium quarkonium dissociation is obtained investigating the real-time evolution of a classical string with fixed endpoints and various orientations with respect to the direction along which the out-of-equilibrium plasma expands. Dissociation occurs as soon as the boundary distortion ends and is faster for quarkonium strings transverse to the collisional axis.

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