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A falling magnetic monopole as a local quench

The AdS/CFT correspondence allows to describe strongly-coupled quantum field theories in terms of weaklycoupled gravitational systems, offering an opportunity to investigate quantum systems at strong coupling far from thermal equilibrium. A simple non-equilibrium process is the quench, representing a system thermalization after the sudden injection of energy. In the case of localized excitation, the quench is holographically realized by the free falling of an object in AdS. This raises the question of how the specifics of the object affect the quench physics.

To gain some insight, I will concentrate on the quenches dual to a falling magnetic monopole and a falling black hole, the latter already studied in the literature. I will show that the holographic energy-momentum tensors have the same functional form, whereas the holographic entanglement entropy is highly sensitive to the bulk details, to the extent that the first law of entanglement entropy is violated in the monopole case.

Collaboration / Activity

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