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Position space analysis of the AdS (in)stability problem

Friday, 17 April 2015 15:40 (30 minutes)

We investigate whether arbitrarily small perturbations in global AdS space are generically unstable and collapse into black holes on the time scale set by gravitational interactions. We argue that current evidence, combined with our analysis, strongly suggests that a set of nonzero measure in the space of initial conditions does not collapse on this time scale. On the other hand, existing results do not provide an equally strong indication whether the unstable solutions also form a set of nonzero measure. We perform an analysis in position space to address this puzzle, and our formalism allows us to directly address the vanishing-amplitude limit. We show that gravitational self-interaction leads to tidal deformations which are equally likely to focus or defocus energy, and we sketch the phase diagram accordingly. We also clarify the connection between gravitational evolution in global AdS and holographic thermalization.

Presenter: LIPPERT, Matthew

Session Classification: Afternoon session