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Evolution of Entanglement in Holographic Systems ELIZABETH BERRIGAN, Chapman University, JOSEPHINE SUH, MIT — Entanglement entropy for a spatial region can be used to measure quantum correlations between subsystems, but is notoriously difficult to calculate using conventional methods. Holographic duality enables one to calculate the entanglement entropy of a class of strongly interacting quantum many-body systems analytically using black-hole physics. Our goal is to use the holographic formulation of the entanglement entropy for a strip region to study the time evolution of a quenched system approaching equilibrium. The geometry of the strip is characterized by a parameter η =2n/d, where n is the dimension of the strip region and d is the total number of spatial dimensions, and by its size R. It has been shown that as the system evolves, for surfaces with $\eta \geq 1$ there exists a regime in which the entanglement entropy grows linearly with respect to time. However, for $\eta < 1$ the story is more complicated and it is unclear whether the linear regime exists. It is our aim to clarify this issue. We found some important differences in the holographic description in contrast to other cases of η, and investigated how this affects the time-evolution of the entanglement entropy.

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