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Entanglement entropy and computational complexity of the Anderson impurity model out of equilibrium[1] ZHUORAN HE, ANDREW MILLIS, Columbia University — We study the growth of entanglement entropy in the real-time dynamics of the Anderson impurity model, with particular focus on the quenched single-impurity Anderson model (SIAM) out of equilibrium. A class of polynomial-time solvable models by the density matrix renormalization group (DMRG) method are identified, in which the entanglement entropy at the maximum entropy cut of the bath grows logarithmically with time. The logarithmic growth of entropy is numerically found to be independent of the Hubbard U in nonequilibrium SIAM. An energy criterion for such polynomial-time complexity is proposed and solvable cases are also found in noninteracting multi-impurity models and periodically driven models.

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