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Numerical time evolution of ETH spin chains by means of matrix product density operators[1] CHRISTOPHER WHITE, Institute for Quantum Information and Matter, Caltech, MICHAEL ZALETEL, Station Q, Microsoft Research, ROGER MONG, Department of Physics and Astronomy, University of Pittsburgh, GIL REFAEL, Institute for Quantum Information and Matter, Caltech — We introduce a method for approximating density operators of 1D systems that, when combined with a standard framework for time evolution (TEBD), makes possible simulation of the dynamics of strongly thermalizing systems to arbitrary times. We demonstrate that the method works on both near-equilibrium initial states (Gibbs states with spatially varying temperatures) and far-from-equilibrium initial states, including quenches across phase transitions and pure states.

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