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Universal Features of the Nonequilibrium Dynamics of Many-Body Quantum Systems[1] LEA SANTOS, EDUARDO TORRES-HERRERA, Yeshiva Univ — We describe the nonequilibrium dynamics of isolated quantum systems with two-body interactions. In these systems, the energy shell is a Gaussian of width σ and it gives the maximum possible spreading of the energy distribution of any initial state. When the distribution achieves this shape, the fidelity decay is Gaussian until saturation. This establishes a lower bound for the fidelity decay in realistic systems. We find excellent agreement between our numerics and the analytical expression for the fidelity. We also provide the general conditions under which the short-time dynamics of few-body observables is controlled by σ. The analyses are developed for systems, initial states, and observables accessible to experiments with cold atoms in optical lattices.

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