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Short- and long-time dynamics of isolated many-body quantum systems[1] MARCO TAVORA, Yeshiva University, JONATHAN TORRES-HERRERA, Universidad Autnoma de Puebla, Mexico, LEA FERREIRA DOS SANTOS, Yeshiva University — We show our results for the relaxation process of isolated interacting quantum spin chains in the integrable and chaotic regimes. The dynamics of the survival probability (the probability for finding the system still in its initial state at later times) and of few-body observables are analyzed. Different time scales are considered. While the short-time evolution is determined by the shape of the weighted energy distribution of the initial state, the long-time behavior depends on the bounds of the spectrum. Both numerical and analytical results are presented as well as comparisons with existing rigorous mathematical derivations. We consider initial states that can be prepared in experiments with cold atoms in optical lattices.

Marco Tavora
Yeshiva University

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