Abstract Submitted
for the DAMOP16 Meeting of
The American Physical Society

Powerlaw Decays and Thermalization in Isolated Many-Body Quantum Systems[1] MARCO TAVORA, Yeshiva University, New York, USA, E.J. TORRES-HERRERA, Universidad Autonoma de Puebla, Puebla, Mexico, LEA SANTOS, Yeshiva University, New York, USA — We propose a new criterion for thermalization in isolated many-body quantum systems. It is based on the powerlaw behavior of the survival probability at long times. The value of the powerlaw exponent depends on the shape and filling of the energy distribution of the initial state. Exponents larger than or equal to 2 correspond to ergodic filling and consequent thermalization. We show that the algebraic behavior, which occurs in both integrable and chaotic systems, may be caused by bounds in the spectrum or by the presence of correlations between the eigenstates of the Hamiltonian. Numerical and analytical results as well as comparisons with existing rigorous mathematical derivations are presented. Our focus are on initial states that can be prepared experimentally using cold atoms in optical lattices.

[1]NSF Grant No. DMR-1147430.

Marco Tavora
Yeshiva University

Date submitted: 27 Jan 2016 Electronic form version 1.4