Relaxation and thermalization
in one-dimensional quantum models

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Abstract

The time evolution of a 1d quantum system after a quench is a challenging many-body problem which can be studied numerically using time-dependent density matrix renormalization group (DMRG) techniques. As shown by Lieb and Robinson, information spreads at a finite velocity resulting in an effective "light cone". In my talk I will present a very efficient DMRG algorithm based on this light cone structure. With the help of the DMRG data and analytical results for non-interacting cases I will discuss the relaxation and thermalization of doublon states in the fermionic Hubbard model.