Quantum quenches and thermalization in one-dimensional systems\textsuperscript{1} MARCOS RIGOL, Georgetown University — We use quantum quenches to study the dynamics and thermalization of hardcore bosons and fermions in finite one-dimensional lattices. We perform exact diagonalizations and find that, far away from integrability, few-body observables thermalize. We then study the breakdown of thermalization as one approaches an integrable point. This is found to be a smooth process in which the predictions of standard statistical mechanics continuously worsen as the system moves toward integrability. We establish a direct connection between the presence or absence of thermalization and the validity or failure of the eigenstate thermalization hypothesis, respectively.

References

\textsuperscript{1}This work was supported by the US Office of Naval Research.