Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Thermalization of Periodically Driven Interacting systems at Finite Size PARAJ TITUM, Joint Quantum Institute, NIST/University of Maryland, College Park, Maryland 20742, USA, KARTHIK SEETHARAM, GIL REFAEL, Institute for Quantum Information and Matter, Caltech, Pasadena, California 91125, USA — Conventional wisdom suggests that the fate of closed interacting driven (Floquet) systems is quite bleak - a featureless maximal entropy state characterized by an infinite temperature. Efforts to thwart this uninteresting fixed point include adding sufficient disorder to possibly realize a Floquet many-body localized phase or more recently, for clean systems, work in a narrow region of drive frequencies that leads to glassy non-thermal behavior at long time. Here we show that in clean systems, specifically due to finite size, the Floquet eigenstates can exhibit non-thermal behavior. We consider a 1d system of spinless fermions with nearest neighbor interacations where the interaction term is driven. Interestingly, even with no static component of the interaction (only static hopping), the quasienergy spectrum contains gaps and a significant fraction of the Floquet eigenstates, at all quasienergies, have non-thermal average doublon correlations. We show how this behavior scales with system size.

Paraj Bhattacharjee
Joint Quantum Institute, NIST/University of Maryland, College Park, Maryland 20742, USA

Date submitted: 11 Nov 2016 Electronic form version 1.4