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Steady States in Fermionic Interacting Dissipative Floquet Systems KARTHIK SEETHARAM, CHARLES BARDYN, Caltech, NETANEL LINDNER, Technion, MARK RUDNER, University of Copenhagen, GIL REFAEL, Caltech — The possibility to drive quantum systems periodically in time offers unique ways to deeply modify their fundamental properties, as exemplified by Floquet topological insulators. It also opens the door to a variety of non-equilibrium effects. Resonant driving fields, in particular, lead to excitations which can expose the system to heating. We previously demonstrated that the analog of thermal states can be achieved and controlled in a fermionic Floquet system in the presence of phonon scattering, spontaneous emission, and an energy filtered fermionic bath. However, interactions play an important role in thermalization and present additional sources of heating. We analyze the effects of weak interactions in the presence of dissipation and the role of coherences in determining the steady state of the driven system. Interactions generically create additional excitations and, in contrast to phonons, may sustain inter-Floquet-band coherences at steady state.

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