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Steady States of Floquet Topological Insulators in the presence of Electron-Phonon Interaction KARTHIK SEETHARAM, California Institute of Technology, NETANEL LINDNER, Technion - Israel Institute of Technology, GIL REFAEL, California Institute of Technology — Floquet topological insulators (FTI) employ a well chosen periodic drive to induce a non-equilibrium topological state in an otherwise trivial semiconductor system. By using a periodic drive, time translation symmetry is partially broken and the topological features are captured by the resulting quasienergy bands defined modulo the drive frequency. When considering a solid state system with electron-phonon interaction, the inevitable contribution of relaxation processes involving multi-photon transitions ("Umklapp"-type processes in quasienergy) leads to unique steady states, which differ from a Fermi-Dirac distribution expected in the absence of such processes. Understanding these steady states is crucial for calculating transport properties of the driven system. Using kinetic equations we study the evolution of the quantum state of the FTI in the presence of electron-phonon interaction, obtain a description of the steady state of the driven system, and study the transport properties of the FTI.

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