

Abstract Submitted  
for the MAR16 Meeting of  
The American Physical Society

**Detecting band inversions by measuring the environment: fingerprints of electronic band topology in bulk phonon linewidths** KUSH SAHA, University of California, Irvine, KATHERINE LEGARE, ION GARATE, University of Sherbrooke, Canada — The interplay between topological phases of matter and dissipative baths constitutes an emergent research topic with links to condensed matter, photonic crystals, cold atomic gases and quantum information. While recent studies suggest that dissipative baths can induce topological phases in intrinsically trivial quantum materials, the backaction of topological invariants on dissipative baths is overlooked. By exploring this back action for a centrosymmetric Dirac insulator coupled to phonons, we show that the linewidths of bulk optical phonons can reveal electronic band inversions. This result is the first known example where topological phases of an open quantum system may be detected by measuring the bulk properties of the surrounding environment.

KUSH SAHA  
University of California, Irvine

Date submitted: 24 Oct 2015

Electronic form version 1.4