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Connecting electron and phonon spectroscopies to consistently determine quasi-particle – phonon coupling on the surface of topological insulators COLIN HOWARD, MICHAEL EL-BATANOUNY, Boston University, FANG-CHENG CHOU, RAMAN SANKAR, National Taiwan University — Photoemission and phonon spectroscopies have yielded widely varying estimates of the electron-phonon coupling parameter on the surfaces of topological insulators, even for a particular material and technique. We connect the results of these experiments by deter- mining the Dirac fermion quasiparticle spectral function using information from measured spectra of a strongly-interacting, low-lying optical surface phonon band. The manifest spectral features resulting from the coupling are found to vary on energy scales < 1 meV, and are distinct from those traditionally observed in the case of acoustic phonons in met- als. We explore different means of determining λ from the electron perspective and identify definitions that yield values consistent with phonon spectroscopy.

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