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Spectral moment sum rules for electron-phonon coupled superconductors in equilibrium and nonequilibrium KHADIJEH NAJAFI, JAMES FREERICKS, Georgetown University — Recent developments in high-resolution time- and angle-resolved photoemission spectroscopy (trARPES) has opened a new path to study the dynamics of quantum materials in nonequilibrium. Several experimental studies have used trARPES to characterize the dynamics of the energy gap in superconductors. One experiment from the Lanzara group indicates that the fluence dependence of the photoemission signal is consistent with a weakening of the electron-phonon coupling in the superconducting state that increases with increasing fluence. The normal state sum rule shows that the integrated spectral weight in the normal state is constant if the phonon fluctuations are unchanged. Here we discuss the extension of these sum rules to the superconducting state.

Khadijeh Najafi
Georgetown University

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