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2D spectroscopy for the Detection of Electron-Phonon Coupling in Perovskites and Cuperates

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The study of coupling between electron-phonon is of fundamental importance to understand Perovskites with interesting photoelectric properties, to address the problem related to the transport properties of materials and to contribute to the debate on the role of electron-phonon coupling in high critical temperature superconductors. Here we present a new approach to detecting the strength of electron-phonon coupling, which is complementary to the usual resonant inelastic x-ray scattering (RIXS), Angle-Resolved Photoemission (ARPES) and emission line broadening with temperature methods for the detection of electron-phonon coupling strength. We suggest a method which combines 2D pump-probe methods and Two phonon absorption in a single experiment to measure the electronic and phonic band gap of the system as well as the e-p coupling strength of Frohlich Hamiltonian. Our calculation is supported by the experimental results on the lead halide perovskites.

Category

Solid State (Theory)

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