

Quasi-particle dispersion and electron-phonon Coupling in superconductors

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What is the role that phonons play in determining the anomalous properties of cuprates superconductors has been a subject of debate for the last decade. However, a clear experiment showing how phonons influence electron dynamics has been lacking. Here, we present the first angle resolved photoemission study (ARPES) of isotope-induced changes in the electron spectral function in high temperature superconductors. Results for optimally doped $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+\delta}$, with $^{16}\text{O} \rightarrow ^{18}\text{O}$ isotope substitution are reported. The interesting isotope induced changes and their energy, momentum, and temperature dependences, as well as their implication on the role of phonons in the superconducting state of the cuprates are discussed.