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Doping dependence of dispersion renormalizations in strongly correlated materials with electron-phonon coupling BETH NOWADNICK, Columbia University, STEVEN JOHNSTON, University of British Columbia, BRIAN MORITZ, SIMES, SLAC National Accelerator Laboratory, RICHARD SCALETTAR, University of California - Davis, THOMAS DEVEREAUX, SIMES, SLAC National Accelerator Laboratory — The renormalization of band dispersions by interactions provides insight into the underlying physics in a strongly correlated material. Coupling between electrons and bosons leads to dispersion kinks at the boson energy, while electronic interactions alone can lead to strong correlation kinks, which generally occur at a higher energy scale. Both of these types of kinks have been observed by ARPES in a variety of strongly correlated materials. Since dispersion kinks yield information on interaction strength, in a system with multiple strong interactions, it is important to disentangle the effects of these interactions on dispersion renormalizations. In order to gain insight into this issue, we simulate the single-band Hubbard-Holstein model using determinant quantum Monte Carlo, a numerically exact technique which allows the electron-electron and electron-phonon interactions to be treated on an equal footing. By analyzing the single particle spectral function for a variety of electron-electron and electron-phonon interaction strengths, we characterize how the interplay of these interactions influences the kink structure, and in particular, its evolution with hole and electron doping.

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