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Renormalization Group Study of the Electron-phonon Interaction in High T_c Cuprates HENRY FU, University of California, Berkeley, CARSTEN HONERKAMP, Institute for Theoretical Physics, Universitat Wuerzburg, DUNG-HAI LEE, University of California, Berkeley — We apply a numerical renormalization group scheme to study the phonon-mediated retarded interactions in the high T_c cuprates. We find that three sets of phonon-mediated retarded quasiparticle scatterings grow under RG flow. These scatterings share the following common features: 1) the initial and final quasiparticle momenta are in the antinodal regions, and 2) the scattering amplitudes have a $x^2 - y^2$ symmetry. All three sets of retarded interactions are driven to strong coupling by the magnetic fluctuations around (π, π) . After growing strong, these retarded interactions can trigger density wave orders with d-wave symmetry. However, due to the d-wave form factor they will leave the nodal quasiparticle unaffected. We conclude that the main effect of electron-phonon coupling in the cuprates is to promote these density wave orders.

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