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Theory of pump-probe photoemission from a d-wave superconductor BENJAMIN NOSARZEWSKI, BRIAN MORITZ, SLAC National Accelerator Laboratory and Stanford University, ALEXANDER F. KEMPER, North Carolina State University, JAMES K. FREERICKS, Georgetown University, THOMAS P. DEVEREAUX, SLAC National Accelerator Laboratory and Stanford University — Motivated by recent tr-ARPES experiments on high-temperature superconductors, we use the nonequilibrium Keldysh formalism to study the time-resolved photoemission spectra of a model electron-boson coupled system out of equilibrium. We introduce a momentum dependence to the electron-boson coupling to produce a superconducting state with d-wave symmetry. We investigate the nature of quasiparticle relaxation and recombination as well as the signatures of amplitude mode oscillations of the superconducting order parameter. We interpret our results in terms of existing experiments in the cuprates.

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