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Quasiparticle dynamics in $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$ films probed by broadband pump-probe spectroscopy CHUNFENG ZHANG, WEI LI, Nanjing University, BENJAMIN GRAY, University of Arkansas, XIAOYONG WANG, Nanjing University, JAK TCHAKHALIAN, MIN XIAO, University of Arkansas — Ultrafast pump-probe spectroscopy can provide viable information on quasiparticle dynamics with respect to phase transition and competing orders in high temperature superconductors. We study the quasiparticle dynamics in epitaxial $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$ films by probing photo-induced reflectivity change over a broadband spectral coverage. The dynamic traces probed at single wavelength show abrupt changes of signal amplitude and decay lifetime at the superconducting transition temperature. The spectra dispersion of reflectivity change at zero temporal delay induced by electronic excitation is found to be quite different in superconducting and normal phases. Moreover, the spectral dispersion is strongly dependent on the delay time between the pump and probe pulse, implying evolution of spectral weight transition contributed by electronic and photonic process. These results are helpful to understand the electronic excitations and their interaction with different bosonic modes in cuprates.

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