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Quasiparticle dynamics in YBCO and YBCO/LSMO Using Femtosecond Optical Pulses J. LEE, D. TALBAYEV, J. XIONG, CINT, Los Alamos National Laboratory, J. ZHU, Theoretical Division, Los Alamos National Laboratory, Q. JIA, A.J. TAYLOR, R.P. PRASANKUMAR, CINT, Los Alamos National Laboratory, CENTER FOR INTEGRATED NANOTECHNOLOGIES, LOS ALAMOS NATIONAL LABORATORY TEAM, THEORETICAL DIVISION, LOS ALAMOS NATIONAL LABORATORY TEAM — The properties of various complex oxide systems, such as multiferroics, high-T_c superconductors and colossal magnetoresistance manganites, have been extensively studied for the past $\sim$25 years. In particular, the interplay between superconductivity (SC) and ferromagnetism (FM) is interesting from both academic and applied viewpoints. we have temporally resolved quasiparticle dynamics in multilayered films composed of the high-temperature superconductor YBCO and the ferromagnetic manganite $LaSrMnO_3$ (LSMO) by performing temperature-dependent UOS experiments. In YBCO alone, we observed two distinct decay relaxation channels that have previously been related to the pseudogap and superconducting gaps and can be explained with the phenomenological Rothwarf-Taylor (RT) model. However, the fast sub-picosecond relaxation related to the pseudogap was not observed in our YBCO/LSMO heterostructures, possibly due to the influence of FM order These first UOS experiments on SC/FM heterostructures demonstrate the ability of UOS to quantify the influence of ferromagnetism on superconductivity through time domain measurements.

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