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Dynamical Mass Renormalization and Fermi Momentum in the Normal State of the Cuprate $Bi_2Sr_2CaCu_2O_{8+x}$ as Instigated and Observed by Two-Photon ARPES J. RAMEAU, Brookhaven National Laboratory, Upton, NY, S. FREUTEL, L. RETTIG, I. AVIGO, M. LIGGES, Universität Duisburg-Essen, Duisburg, Germany, Y. YOSHIDA, H. EISAKI, National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan, J. SCHNEELOCH, R. ZHONG, Z. XU, G. GU, P. JOHNSON, Brookhaven National Laboratory, Upton, NY, U. BOVENSIEPEN, Universität Duisburg-Essen, Duisburg, Germany — The dressing of quasiparticles in solids is investigated by observing changes of the electronic structure $E(\boldsymbol{k})$ driven by femtosecond laser pulses. Employing time- and angle-resolved photoemission on the optimally doped cuprate $Bi_2Sr_2CaCu_2O_{8+x}$, just above T_c, we observe two effects with different characteristic temporal evolutions and, therefore, different microscopic origins. The experiment was carried out using amplified ultrafast laser pulses and a novel time of flight laser-ARPES setup. Both of the effects observed thusly are driven by the relatively high fluences of our amplified near-infrared pump laser and indicate that non-trivial, dynamical changes of the normal state cuprate band structure may be induced by ultrafast laser pulses over time scales at least as short as 150 fs. First, a 10% change of the effective mass due to the 70 meV kink in $E(\boldsymbol{k})$ is found to occur during the experiment's 100 fs temporal resolution. Second, a time- and fluence-dependent change in k_F is observed. The causes and ramifications of these disparate processes will be discussed.

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