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Photoinduced Chemical Potential Shifts in Bi2212 TRISTAN MILLER, CHRISTOPHER SMALLWOOD, WENTAO ZHANG, Lawrence Berkeley National Laboratory and UC Berkeley, HIROSHI EISAKI, Electronics and Photonics Research Institute, National Institute of Advanced Industrial Science and Technology, JOSEPH ORENSTEIN, ALESSANDRA LANZARA, Lawrence Berkeley National Laboratory and UC Berkeley — In superconducting materials, the chemical potential is particularly important because it is the energy of the superconducting condensate. The chemical potential may be perturbed by laser pulses, giving us new insight into the equilibrium properties of cuprate superconductors. Here, we report on studies of the photoinduced change of chemical potential in Bi2212 using time- and angle-resolved photoemission spectroscopy. We make an important distinction between the chemical potential relative to the vacuum energy, and relative to the valence band energy. The observations can be explained with considerations of the density of states. Measurements on different dopings of Bi2212 also provide new clues to the pseudogap phase.

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