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Gap Dynamics in Bi2212 Studied by Time- and Angle-Resolved Photoemission CHRISTOPHER SMALLWOOD, Department of Physics, UC Berkeley; and Materials Sciences Division, Lawrence Berkeley National Lab, WENTAO ZHANG, Materials Sciences Division, Lawrence Berkeley National Lab, TRISTAN MILLER, Department of Physics, UC Berkeley; and Materials Sciences Division, Lawrence Berkeley National Lab, CHRIS JOZWIAK, Advanced Light Source, Lawrence Berkeley National Lab, HIROSHI EISAKI, Electronics and Photonics Research Institute, National Institute of Advanced Industrial Science and Technology, ALESSANDRA LANZARA, Department of Physics, UC Berkeley; and Materials Sciences Division, Lawrence Berkeley National Lab — Recent developments in ultrafast spectroscopy have shown that irradiating cuprate superconductors with intense, short pulses of light can induce nonequilibrium dynamics that may hold clues for understanding why the critical temperature (Tc) in these materials exceeds that of almost all other superconductors by an order of magnitude or more. Using a 1.5 eV pump pulse, and 5.9 eV probe, we use time- and angle-resolved photoemission spectroscopy (trARPES) to characterize the non-equilibrium dynamics of the gap and transient quasiparticle population in the cuprate superconductor Bi2212 (optimally doped, Tc=91 K). Correlations between these two quantities reveal clues for the underlying mechanism that drives the formation of the pseudogap and superconducting states in the hole-doped cuprates.

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