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Doping-dependent laser-ARPES studies on Bi-2212 I. M. VISHIK, W.-S. LEE, F. SCHMITT, B. MORITZ, Stanford University, T. SASAGAWA, Tokyo Institute of Technology, S. UCHIDA, University of Tokyo, K. FUJITA, Cornell University, S. ISHIDA, University of Tokyo, C. ZHANG, Sandong University, T. P. DEVEREAUX, Z.-X. SHEN, Stanford University — With the improved resolution of laser-based ARPES, we can access finer features in the single particle spectrum. We report on our laser-ARPES experiments on $Bi_2Sr_2CaCu_2O_{8+\delta}$ (Bi-2212), particularly on the recently-discovered nodal kink at low energies (ω <10 meV). We have studied the doping dependence of this low-energy kink in the underdoped regime, and we find that the kink is robust for different dopings, with signatures both in the real and imaginary part of the self energy. Moreover, the renormalization of the nodal velocity becomes stronger with underdoping, leading to a doping-dependent nodal Fermi velocity, in contrast to previously reported phenomenology. Together with laser-ARPES measurements of the gap velocity, v_2, comparisons can be made to thermodynamic measurements.

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