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Doping dependence of the coupling of electrons to bosonic modes in the single-layer high-temperature superconductor, $Bi_2Sr_2CuO_6$[1] W. MEEVASANA, D.H. LU, F. BAUMBERGER, W.S. LEE, T. CUK, J. ZAANEN, Z.-X. SHEN, Stanford University, N.J.C. INGLE, K.M. SHEN, U. of British Columbia, Canada, J.R. SHI, U. of Texas, Austin, H. EISAKI, Nanoelectronic Research Institute, AIST, Japan, T.P. DEVEREAUX, U. of Waterloo, Canada , N. NAGAOSA, CREST, U. of Tokyo, Japan, S. SAHRAKORPI, M. LINDROOS, R. S. MARKIEWICZ, A. BANSIL, Northeastern University — A recent highlight in the study of high-T_c superconductors is the observation of band renormalization/self-energy effects on the quasiparticles in the form of kinks in their dispersions as measured by photoemission, interpreted as signatures of collective bosonic modes coupling to the electrons. Here we compare for the first time the self-energies in an optimally doped and strongly overdoped, non-superconducting single-layer Bi-cuprate, $Bi_2Sr_2CuO_6$. Besides a strong overall weakening we also find that weight of the self-energy in the overdoped system shifts to higher energies. We present evidence that this might well be related to the coupling to c-axis phonons which are unscreened at optimal doping, being particularly sensitive to the rapid change of the c-axis screening in this doping range. We also discuss doping dependencies of the FS maps and dispersions in terms of the corresponding band structure and one-step photointensity computations.

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Worawat Meevasana
Stanford University

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