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ARPES Study of Nodal Quasiparticles of $Bi_2Sr_{1.6}La_{0.4}CuO_{6+\delta}$ Using Low-Energy Excitation Photons T. KAMO, K. YAMAZAKI, T. YAMASAKI, H. ANZAI, A. INO, M. ARITA, H. NAMATAME, M. TANIGUICHI, Graduate School of Science and Hiroshima Synchrotron Radiation Center, Hiroshima University, A. FUJIMORI, University of Tokyo, Z.-X. SHEN, Stanford University, K. FUJITA, S. UCHIDA, Department of Physics, University of Tokyo
— Using low-energy synchrotron radiation ($h\nu$ = 7.75 eV) as excitation photons, the quasiparticle-momentum resolution has been dramatically improved ($\Delta k \sim 0.01$Å^{-1}) in the angle-resolved photoemission (ARPES) study of single-layer high-T_c cuprate $Bi_2Sr_{1.6}La_{0.4}CuO_{6+\delta}$ (Bi2201). We report the new experimental result on the nodal quasiparticle dispersion and scattering rate of optimally doped Bi2201 (T_c = 33 K) over an extended temperature range. Since only a single quasiparticle band is involved for the single-layer cuprate, the high-resolution quasiparticle images have provided us the direct information on fine quasiparticle structures. In comparison to the result on the bilayer cuprate Bi2212, we will discuss the character of the multiple excitation modes coupled with the electrons.

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