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**Momentum dependence of Fermi surface maps in angle-resolved photoemission spectrum of** $Bi_2Sr_2CuO_6$ **(Bi2201)** SUSMITA BASAK, Northeastern U., J. NIEMINEN, M. LINDROOS, Noreastern U. and Tampere U. Tech., Finland, R. S. MARKIEWICZ, A. BANSIL, Northeastern U. — We have investigated the effect of ARPES matrix element on photointensity for emission from the Fermi energy as a function of photon energy in Bi2201 using first-principles as well as tight-binding model calculations. Our results show that as the photon energy increases and photoemitted electrons are spread over a larger area of momentum space, the highest spectral intensities generally remain pinned to the largest momenta probed at any given photon energy. The tight-binding calculations, which involve a three band Hubbard Hamiltonian based on Cu $d_{x^2-y^2}$ and O $p_x$, $p_y$ orbitals, give insight into the role of the ARPES matrix element in shaping the photointensities. A relatively simple formula is derived for the matrix element, showing how much of the zone-to-zone variation of the photointensity is controlled by the structure factor associated with the Bloch wavefunction.

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