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Surface-enhanced charge-density-wave instability in underdoped Bi2201 J.A. ROSEN, R. COMIN, G. LEVY, G. SAWATZKY, A. DAMASCELLI, Quantum Matter Institute, UBC, Vancouver, Canada, G. BLAKE, T.T.M. PALSTRA, University of Groningen, The Netherlands, B. KEIMER, MPI Stuttgart, Germany, L. PETACCIA, Elettra, Trieste, Italy, Y. YOSHIDA, H. EISAKI, AIST, Tsukuba, Japan — Neutron and x-ray scattering experiments have provided mounting evidence for spin and charge ordering phenomena in underdoped cuprates, ranging from stripe correlations in Nd-LSCO to the recently discovered charge-density-waves in YBCO. Here we show that these electron-lattice instabilities also exhibit a previously unrecognized bulk-surface dichotomy. Surface-sensitive electronic and structural probes uncover a temperature-dependent evolution of the CuO_2 plane band dispersion and apparent Fermi pockets in underdoped Bi2201, which is associated with a strong temperature dependence of the incommensurate superstructure periodicity below 130 K. In stark contrast, the structural modulation revealed by bulk-sensitive probes is temperature independent. These findings point to a surface-enhanced incipient charge-density-wave instability, driven by Fermi surface nesting. This discovery is of critical importance in the interpretation of single-particle spectroscopy data and establishes the surface of cuprates as a rich playground for the study of electronically soft phases.

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