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Evidence for Charge-Density-Wave in Underdoped Bi2201 from ARPES and LEED J.A. ROSEN, R. COMIN, G. LEVY, D. FOURNIER, Z.-H. ZHU, B. LUDBROOK, C.N. VEENSTRA, D. WONG, P. DOSANJH, Department of Physics & Astronomy, University of British Columbia, Vancouver, British Columbia V6T 1Z1, Canada, Y. YOSHIDA, H. EISAKI, Superconducting Electronics Group, National Institute of Advanced Industrial Science and Technology, Ibaraki 305-8568, Japan, L. PETACCIA, Sincrotrone Trieste, Strada Statale 14 Km 163.5, 34149 Trieste, Italy, A. DAMASCELLI, Quantum Matter Institute and Department of Physics & Astronomy, University of British Columbia, Vancouver, British Columbia V6T 1Z4, Canada — While there is mounting evidence for a broken symmetry in the pseudogap state of the high-T_c cuprates, the identification of a specific phase remains elusive. Through the combination of electronic (ARPES) and structural (LEED) probes, we uncover a temperature dependent evolution of the CuO_2 plane band dispersion in highly-ordered Bi2201, which is directly associated with a hitherto-undetected evolution of the incommensurate superstructure. The quasi-linear, continuous variation of the modulation wavelength $2\pi/Q_2$ from ~ 66 to 43Å, below a characteristic $T_{Q_2} \simeq 130\,\mathrm{K}$, provides evidence for an electronically-driven charge-density-wave ordering. This points to a remarkable electron-lattice coupling, in which the footprint of the BiO-layer-induced superstructure is found in the modulated electronic structure of the CuO_2 plane.

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