

Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Scattering from incipient stripe order in the high-temperature superconductor $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+x}$ ¹ EDUARDO H. DA SILVA NETO, COLIN PARKER², PEGOR AYNAJIAN, AAKASH PUSHUP³, Princeton University, JINSHENG WEN, ZHIJUN XU, GENDA GU, Brookhaven National Laboratory (BNL), ALI YAZDANI, Princeton University — We use spectroscopic mapping with the scanning tunneling microscope to probe modulations of the electronic density of states in single crystals of the high temperature superconductor $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+x}$ as a function of temperature. We show that the Cu-O bond-oriented modulations, with periodicity near four lattice constants ($4a$), that form below the pseudogap temperature have a temperature-dependent energy dispersion displaying different behaviors in the superconducting and pseudogap states. We demonstrate that quasiparticle scattering off impurities does not capture the experimentally observed energy- and temperature-dependence of these modulations. Instead, a model of scattering of quasiparticles from short-range stripe order is necessary to reproduce the experimentally observed energy dispersion of the bond-oriented modulations and its temperature dependence across the superconducting critical temperature, T_c .

¹This work is funded by a DOE-BES grant. Infrastructure at the Princeton Nanoscale Microscopy Laboratory are also supported by grants from NSF-DMR, Keck Foundation, and NSF-MRSEC.

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Date submitted: 29 Nov 2011

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