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Single reconstructed Fermi surface pocket in an underdoped single layer cuprate superconductor MUN K. CHAN, National High Magnetic Field Laboratory,Los Alamos National Laboratory, R. D. MCDONALD, B. J. RAMSHAW, K. A. MODIC, National High Magnetic Field Laboratory, Los Alamos National Laboratory, N. BARISIC, Technishce Universitat Wein, M. GREVEN, University of Minnesota, N. HARRISON, National High Magnetic Field Laboratory, Los Alamos National Laboratory — The observation of a small reconstructed Fermi surface with quantum oscillations in bilayer $YBa_2Cu_3O_{6+x}$ opened a path towards identifying broken symmetry states in underdoped cuprates. However, the multi-frequency spectrum of quantum oscillations and complications from bilayer coupling has rendered such an identification inconclusive. Our high resolution quantum oscillation study of the structurally simpler single layer cuprate $HgBa_2CuO_{4+\delta}$ (Hg1201) reveal a single oscillatory component with no signatures of magnetic breakdown tunneling. From this, we conclude that the reconstructed Fermi surface of Hg1201 is comprised of only a single pocket with negligible c-axis warping. Quantitative modeling of these results allow us to determine that biaxial charge-density-wave order is responsible for Fermi surface reconstruction. We find that the characteristic reconstruction gap is a significant fraction of the pseudogap energy. 'Criss-crossed' uniaxial charge stripes is ruled out as a viable alternative to biaxial order within a CuO_2 plane for Hg1201.

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