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Electron pockets in the Fermi surface of hole-doped high-Tc superconductors DAVID LEBOEUF, NICOLAS DOIRON-LEYRAUD, JULIEN LEVALLOIS, RAMZY DAOU, J.-B. BONNEMAISON, NIGEL HUSSEY, LUIS BALICAS, BRAD RAMSHAW, RUIXING LIANG, DOUG BONN, WALTER HARDY, S. ADACHI, CYRIL PROUST, LOUIS TAILLEFER — The Fermi surface of the electronic states in the underdoped 'YBCO' materials YBa2Cu3Oy and YBa2Cu4O8 was recently shown to include small pockets, in contrast with the large cylinder that characterizes the overdoped regime, pointing to a topological change in the Fermi surface. Here we report the observation of a negative Hall resistance in the magnetic-field-induced normal state of YBa2Cu3Oy and YBa2Cu4O8, which reveals that these pockets are electron-like rather than hole-like. We propose that these electron pockets most probably arise from a reconstruction of the Fermi surface caused by the onset of a density-wave phase, as is thought to occur in the electron-doped copper oxides near the onset of antiferromagnetic order.

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