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A new quantum oscillation frequency in the thermoelectric response of YBa2Cu3Oy NICOLAS DOIRON-LEYRAUD, SAMUEL RENE DE COTRET, FRANCIS LALIBERTE, LOUIS TAILLEFER, Universite de Sherbrooke, BRAD RAMSHAW, RUIXING LIANG, DOUG BONN, WALTER HARDY, University of British Columbia — The Seebeck and Nernst coefficients of the cuprate superconductor YBa2Cu3Oy were measured in a high-quality single crystal with doping p = 0.11, as a function of magnetic field up to 45 T at low temperatures. Giant quantum oscillations are observed in both thermoelectric coefficients. The dominant frequency Fa = 530 T is in agreement with previously observed oscillations in transport, specific heat, and magnetization, attributed to a closed electron Fermi surface. The Seebeck effect reveals an additional frequency Fb = 95 T [1], with a low effective mass [2]. We propose that this new frequency arises from a hitherto undetected closed hole-like Fermi surface. This can explain the variation with magnetic field of several transport properties, such as the Seebeck, Hall [3], and thermal Hall effects, as well as the doping dependence of the normal-state Seebeck effect at low temperature [4], which is inconsistent with a lone electron pocket. Work performed at the NHMFL Tallahassee. [1] N. Doiron-Leyraud et al., preprint. [2] S. Badoux et al., preprint. [3] D. LeBoeuf et al., Phys. Rev. B 83, 054056 (2011). [4] F. Laliberte et al., Nat. Commun. 2, 432 (2011).

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