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Thermal Hall effect in YBCO: Probing Fermi-surface reconstruction inside the superconducting state OLIVIER CYR-CHOINIÈRE, FRANCIS LALIBERTÉ, SOPHIE DUFOUR-BEAUSÉJOUR, GAËL GRISSONNANCHE, RYAN T. GORDON, NICOLAS DOIRON-LEYRAUD, LOUIS TAILLEFER, Universite de Sherbrooke, Canada, BRAD J. RAMSHAW, RUIXING LIANG, DOUG A. BONN, WALTER N. HARDY, University of British Columbia, Canada, CYRIL PROUST, LNCMI, France — The thermal Hall (Righi-Leduc) effect was measured in the cuprate superconductor YBCO at a doping $p = 0.11$, as a function of magnetic field H up to 29 T. At temperatures well below the zero-field superconducting T_c, the thermal Hall conductivity κ_{xy} is positive at low field and then turns over to become negative at fields above 15 T. The negative κ_{xy} is consistent with the negative Hall and Seebeck coefficients observed in the normal state above 25 T [1,2]. This further supports our interpretation: the Fermi surface of YBCO contains a small electron-like pocket [3] in that region of the phase diagram, the result of a Fermi-surface reconstruction attributed to stripe order [4]. In the T= 0 limit at $H = 29$ T, we find reasonable agreement with the Wiedemann-Franz law, $\kappa_{xy}/T = L_0\sigma_{xy}$. The fact that κ_{xy} changes sign at $H \approx 15$ T is consistent with a scenario of phase competition whereby stripe order emerges only at finite field, in agreement with recent NMR studies that detect the onset of charge-stripe order above 15 T [5].

[1] LeBoeuf *et al.*, *PRB* **83**, 054056 (2011); [2] Laliberté *et al.*, *Nat. Commun.* **2**, 432 (2011); [3] LeBoeuf *et al.*, *Nature* **450**, 533 (2007); [4] Chang *et al.*, *PRL* **104**, 057005 (2010); [5] Wu *et al., Nature* **477**,191 (2011).

Olivier Cyr-Choinière
Université de Sherbrooke, Canada

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