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Thermal conductivity as a direct probe of the upper critical field H_{c2} in cuprate superconductors G. GRISSONNANCHE, O. CYR-CHOINIERE, S. DUFOUR-BEAUSEJOUR, A. JUNEAU-FECTEAU, N. DOIRON-LEYRAUD, L. TAILLEFER, University of Sherbrooke, B. RAMSHAW, R. LIANG, D. BONN, W. HARDY, University of British Columbia, S. KRAMER, LNCMI, D. GRAF, NHMFL — The value of the upper critical field H_{c2} in cuprate superconductors is an open question, subject to much debate [1]. Owing to its sensitivity to vortex scattering, the thermal conductivity is a powerful technique to directly measure the upper critical field H_{c2} in a clean type-II superconductor [2]. Here we report measurements of the thermal conductivity in the underdoped cuprate superconductor YBCO in magnetic fields up to 45 T, from which we can directly extract H_{c2} . We find that H_{c2} is remarkably low at a doping $p = 0.11$, showing that quantum oscillations [3, 4] are observed above H_{c2} , in a normal state without vortices.

- [1] J. Chang *et al.*, Nat. Phys. **8**, 751 (2012).
- [2] A. B. Vorontsov and I. Vekhter, Phys. Rev. B **75**, 224502 (2007).
- [3] N. Doiron-Leyraud *et al.*, Nature **447**, 565 (2007).
- [4] S. C. Riggs *et al.*, Nat. Phys. **7**, 332 (2011).

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