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Thermo-Electric Study of Fermi Surface Reconstruction in $\mathbf{YBa_2Cu_3O}_y$ N. DOIRON-LEYRAUD, J. CHANG, R. DAOU, D. LEBOEUF, F. LALIBERTE, B. PINGAULT, L. TAILLEFER, Universite de Sherbrooke, C. PROUST, LNCMP Toulouse, B.J. RAMSHAW, R. LIANG, D.A. BONN, W.N. HARDY, University of British Columbia, H. TAKAGI, University of Tokyo, A. ANTUNES, I. SHEIKIN, LNCMI Grenoble, K. BEHNIA, ESPCI Paris — The Seebeck and Nernst coefficients S and ν of the high-T_c superconductor $YBa_2Cu_3O_y$ (YBCO) were measured in a single crystal with a hole concentration $p = 0.12$ in magnetic fields up to $H = 28$ T. For temperatures down to 9 K, ν becomes independent of field by $H \simeq 30$ T, showing that by then the Nernst signal due to superconducting fluctuations has become negligible. In this field-induced normal state, S/T and ν/T are both large and negative in the $T \to 0$ limit. The magnitude of S/T is consistent with the small Fermi surface pocket previously detected via quantum oscillations in YBCO at a similar doping and its negative sign confirms that the pocket is electron-like. The normal-state $S(T)$ of YBCO is remarkably similar to that of $La_{2-x}Ba_xCuO_4$, $La_{2-x-y}Nd_ySr_xCuO_4$ and $La_{2-x-y}Eu_ySr_xCuO_4$ at $p \simeq 1/8$, all four materials showing a change of sign at $T \simeq 50$ K. Given that in the latter three materials this change of sign is clearly due to the onset of spin/charge density wave ('stripe') order, we infer that a similar density-wave mechanism must cause the Fermi surface reconstruction in YBCO.

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