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Magnetic-field-induced normal state in a stripe-ordered cuprate $La_{1.7}Eu_{0.2}Sr_{0.1}CuO_4$ in the zero-temperature limit[1] ZHENZHONG SHI, P. G. BAITY, DRAGANA POPOVIĆ, Dept. of Phys. & Natl. High Magnetic Field Lab., Florida State Univ., T. SASAGAWA, Tokyo Inst. of Tech. — Charge orders have been discovered in all hole-doped cuprates, but their precise interplay with the high-temperature superconductivity (SC), especially under extreme conditions of high magnetic fields (H), is not well understood. We have studied the magnetotransport properties of the stripe-ordered cuprate $La_{1.7}Eu_{0.2}Sr_{0.1}CuO_4$ [$T_c(H = 0) = 5.9$ K] at high fields ($H \leq 35$ T) and very low temperatures ($T \geq 16$ mK). Our results reveal, for the first time in stripe-ordered cuprates, a full sequence of ground states as a function of H: a vortex solid [$T_c(H) \neq 0$], a vortex glass ($T_c = 0$), a possible coexistence region of the vortex glass and the high-H normal phase, and the high-H normal phase in which SC is suppressed. The high-H normal state is characterized by the negative magnetoresistance and a $\ln(1/T)$ dependence of the resistivity, which becomes weaker with increasing H and disappears for $H > 55$ T. Thus the results strongly suggest that the high-field ground ($T = 0$) state in stripe-ordered cuprates is a metal.

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Zhenzhong Shi
Natl. High Magnetic Field Lab.

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