

Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Role of Disorder and Oxygen Reduction on Transport Properties in $\text{Pr}_{1.83}\text{Ce}_{0.17}\text{CuO}_{4\pm\delta}$ ¹ J. S. HIGGINS, Y. DAGAN², M. C. BARR, R. L. GREENE, Center for Superconductivity Research, Physics Department, University of Maryland, College Park, Maryland, USA 20742, B. D. WEAVER, Naval Research Laboratory, Code 6818, Washington, DC, USA 20375 — We present a study on the effects of changing the oxygen content in the electron-doped superconducting cuprate $\text{Pr}_{2-x}\text{Ce}_x\text{CuO}_{4\pm\delta}$ (PCCO). Epitaxial, c-axis oriented, overdoped ($x = 0.17$) thin films were grown using a pulsed laser deposition technique, and the oxygen content was adjusted during a post-growth annealing process. In addition to the transition temperature (T_c), measurements of the Hall effect and resistivity were performed at low temperatures ($T < T_c$, $H > H_{C2}$) in several films of different oxygen content. We compare the disorder observed in these oxygenated samples with disorder induced by proton irradiation in an optimally annealed ($x = 0.17$) film. An analysis of the data demonstrates that a change in the oxygen content of PCCO has two separable effects: 1) a disorder effect, and 2) a doping effect similar to that of cerium.

¹This work was supported by NSF Grant DMR-0352735 and, in part, by ONR

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Date submitted: 29 Nov 2005

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