

Abstract Submitted  
for the MAR07 Meeting of  
The American Physical Society

**Superconducting Phase Diagram and Vortex-glass Scaling of the Electron-Doped Superconductor  $\text{Sm}_{2-x}\text{Ce}_x\text{CuO}_{4-y}$**  D.J. SCANDERBEG, B.J. TAYLOR, R.E. BAUMBACH, K.T. CHAN, M.B. MAPLE, University of California, San Diego — We report the growth and characterization of thin films of the electron-doped superconductor  $\text{Sm}_{2-x}\text{Ce}_x\text{CuO}_{4-y}$  over a wide doping range  $0.13 \leq x \leq 0.19$ . The shape of the superconducting dome is similar to other electron-doped compounds, such as  $\text{Nd}_{2-x}\text{Ce}_x\text{CuO}_{4-y}$  and  $\text{Pr}_{2-x}\text{Ce}_x\text{CuO}_{4-y}$ , and shows a peak in the superconducting transition temperature  $T_c$  at a doping level  $x \approx 0.15$ . Magnetoresistance data  $\rho(H, T)$  in fields up to 17 T reveal a metal to insulator transition in the underdoped region. Analysis of Hall effect measurements from the underdoped to overdoped regime is presented along with vortex-glass (VG) scaling analysis of the transport measurements. VG scaling shows no change in the dynamical vortex behavior from the underdoped to overdoped regions. This research was sponsored by the DOE under Grant No. DE-FG02-04ER46105 and the CULAR program no. 9985-001. A portion of this work was performed at the National High Magnetic Field Laboratory (NHMFL), which is supported by NSF Cooperative Agreement No. DMR-0084173, by the State of Florida, and by the DOE.

D. J. Scanderbeg

Date submitted: 22 Nov 2006

Electronic form version 1.4