Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Thermoelectric power as evidence for a Quantum Phase Transition in electron-doped cuprates $Pr_{2-x}Ce_xCuO_{4-y}$.[1] PENGCHENG LI, R.L. GREENE, Center for Superconductivity Research and Department of Physics, University of Maryland, College Park, MD, 20742, K. BEHNIA, Laboratoire de Physique Quantique (CNRS), ESPCI, 10 Rue Vauquelin, 75005 Paris, France — We report magnetic field driven normal state thermoelectric power (S) measurement in electron-doped cuprate system $Pr_{2-x}Ce_xCuO_{4-y}$ as a function of doping (x from 0.11 to 0.19) down to 2K. Consistent with the normal state Hall effect[a], S in the underdoped region (0.11-0.15) is negative. S changes sign at certain temperatures in overdoped samples (0.16-0.18), which supports the picture of a spin density wave rearrangement of the Fermi surface[b]. More significantly, both S and S/T at 2K (at 9T) increase dramatically from x=0.11 to 0.16, and then saturate in the overdoped region. This kink around x=0.16 is similar to the previous Hall effect result[a] in $Pr_{2-x}Ce_xCuO_{4-y}$. Our results are further evidence for antiferromagnetism to paramagnetism quantum phase transition in electron-doped cuprates. a. Y. Dagan et al, Physical Review Letters, 92 (16) 167001, 2004 b. A. Zimmers et al, Europhysics Letters 70 (2) 225, 2005

[1]This work is supported by NSF Grant DMR-0352735

Pengcheng Li
Center for Superconductivity Research and Department of Physics,
University of Maryland, College Park, MD, 20742

Date submitted: 01 Dec 2005 Electronic form version 1.4