Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Evolution of Superconducting $\mathbf{H}_{c2}$ Transition with La-Doping in $\mathbf{Ce}_{1-x}\mathbf{La}_x\mathbf{CoIn}_5$ JOHNPIERRE PAGLIONE, M.A. TANATAR, E. BOAKNIN, D.G. HAWTHORN, R.W. HILL, M. SUTHERLAND, Dept. Physics, University of Toronto, LOUIS TAILLEFER, Dépt. Physique, Université de Sherbrooke, C. PETROVIC, Dept. Physics, Brookhaven National Laboratory — Recent measurements of the heavy-fermion superconductor $CeCoIn_5$ have revealed a field-tuned quantum critical point which coincides with a *first-order* superconducting transition H_{c2} as $T \to 0$ [1], resulting in a completely unique and intriguing H-T phase diagram with no known magnetic phase. By substituting La for Ce, a gradual destruction of the superconducting phase allows an investigation of the correlation between the order of H_{c2} and the field-tuned quantum critical behaviour. Here we report low temperature heat and charge transport measurements of $Ce_{1-x}La_xCoIn_5$ as a function of field and doping, revealing an intriguing evolution of the quantum critical behaviour in this system.

[1] J. Paglione *et al.*, Phys. Rev. Lett. 91, 246405 (2003).

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Date submitted: 02 Dec 2004 Electronic form version 1.4