Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Anisotropic effect of Cd-doping on superconducting phase in $CeCoIn_5$ at high fields YOSHIFUMI TOKIWA, ROMAN MOVSHOVICH, FILIP RONNING, ERIC BAUER, Los Alamos National Laboratory, ANDREA BIANCHI, Departement de physique, Universite de Montreal, Montreal, QC, H3C 3J7, Canada, LOS ALAMOS NATIONAL LABORATORY TEAM, DEPARTEMENT DE PHYSIQUE, UNIVERSITE DE MONTREAL, MONTREAL, QC, H3C 3J7, CANADA COLLABORATION — Unconventional superconductor $CeCoIn_5$ at high magnetic field displays first order superconducting (SC) transition, and an additional high field-low temperature SC phase (previously proposed to be an inhomogeneous superconducting FFLO state). We have studied Cd-doping effect on the FFLO state and the first order SC transition by measuring specific heat C(T) of $CeCo(In_{1-x}Cd_x)_5$ (x=0.01, 0.02 and 0.03) at low temperatures and high fields. Our data show that the FFLO state is already destroyed by 1% Cd-doping. The effect of Cd doping on the first order SC transition is anisotropic. The cross-over temperature T_0, where the superconducting transition changes its nature from first to second order, decreases rapidly with increasing doping for $H//[100]$ and disappears already at x=0.02, while it remains rather temperature-independent for $H//[001]$ up to x=0.03.

Yoshifumi Tokiwa
Los Alamos National Laboratory

Date submitted: 08 Jan 2008 Electronic form version 1.4