Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Specific heat studies of the chiral phase transition in charge ordered 1T-$TiSe_2$ XU LUO, Material Science Division, Argonne National Laboratory, Argonne, IL60439, J.-P. CASTELLAN, Karlsruhe Institute of Technology, D-76021, Karlsruhe, Germany, S. ROSENKRANZ, R. OSBORN, Q. LI, Material Science Division, Argonne National Laboratory, Argonne, IL60439, G. KARAPETROV, Department of Physics, Drexel University, Philadelphia, PA 19104, J.P.C. RUFF, CHESS, Cornell University, Ithaca, NY 14853, U. WELP, Material Science Division, Argonne National Laboratory, Argonne, IL60439, J. VAN WEZEL, H.H. Willis Physics Laboratory, University of Bristol, BS8 1TL, UK — We use high-resolution steady-state ac-micro-calorimetry to investigate the transition of 1T-$TiSe_2$ into the charge-ordered state. A mean-field like step of ~ 0.4 J/molK in the specific heat C(T) near 193 K signals the transition into the commensurate CDW state. Upon further cooling, C(T) varies linearly in temperature until near 180 K a clear break in the slope of C(T) by 13mJ/molK^2 and possibly a small step indicate a second phase transition. Comparisons with theoretical predictions based on the Ginzburg-Landau free energy, with resistivity measurements, and with x-ray diffraction indicate that, at this transition, the commensurate CDW state changes into a helically ordered state along the crystal c-axis.

Xu Luo
Argonne National Laboratory

Date submitted: 18 Nov 2012 Electronic form version 1.4