Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Quantum oscillations of $Cu_xBi_2Se_3$ in intense magnetic field BENJAMIN LAWSON, GANG LI, TOMOYA ASABA, FAN YU, Univ of Michigan - Ann Arbor, ZIJI XIANG, University of Science and Technology of China, COLIN TINSMAN, Univ of Michigan - Ann Arbor, Y.S. HOR, Missouri University of Science and Technology, LU LI, Univ of Michigan - Ann Arbor — Quantum oscillations are generally studied to resolve the electronic structure of topological insulators. Recently there has been much interest in resolving the Fermi Surface of $Cu_xBi_2Se_3$ to shed light on the nature of its superconducting state - in particular to determine if it is a topological superconductor, an exotic class of material. Using torque magnetometry, quantum oscillations in magnetization (the de Haas–van Alphen effect) were observed [1] in $Cu_xBi_2Se_3$ up to 90 degrees in polar angle with respect to the sample surface. The doping of Cu in Bi_2Se_3 increases the carrier density and its ellipsoidal Fermi Surface becomes increasingly elongated. The detailed study of the temperature dependence at different tilt angles reveals strong effective mass anisotropy. The comparison of oscillation data in magnetization with that in magnetoresistance [2] helps elucidate the electronic structure of this interesting material.

[1] B.J. Lawson, Y.S. Hor, Lu Li, Phys. Rev. Lett. **109**, 226406 (2012).
[2] E. Lahoud, *et al.*, Phys. Rev. B **88**, 195107 (2013).

Benjamin Lawson
Univ of Michigan - Ann Arbor

Date submitted: 14 Nov 2013 Electronic form version 1.4