Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Proximity effect in MBE grown bismuth chalcogenide thin films[1]

BRIAN MULCAHY, MAO ZHENG, CAN ZHANG, ALLISON DOVE, ZACHARY R. YOSCOVITS, GUSTAF OLSON, JAMES N. ECKSTEIN, University of Illinois at Urbana-Champaign — Topological insulators (TIs) comprise a new state of matter which provides access to novel physics. Of the set of materials that have exhibited spectroscopic evidence of topologically protected surface states, bismuth chalcogenide systems have garnered particular interest due to their relatively large nominal bulk band gap and single Dirac cone near the Fermi surface. We are studying the superconducting proximity effect in MBE grown thin films of Bi_2Se_3, Bi_2Te_3, and ternary compounds. After *in situ* deposition of a low temperature superconductor, the films are patterned into devices containing a matrix of superconducting islands of tunable size and density on top of the TI layer. We discuss growth optimization, device processing, the role of the superconductor-TI interface, and proximity effect transport results.

[1]This work is supported by the NSF.

Brian Mulcahy
University of Illinois at Urbana-Champaign

Date submitted: 09 Nov 2012 Electronic form version 1.4