Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Coupling between 3-D topological insulator and superconductor[1] VLADIMIR ORLYANCHIK, MARTIN STEHNO, CHRISTOPHER NUGROHO, DALE VAN HARLINGEN, University of Illinois at Urbana-Champaign, NAMRATA BANSAL, MATTHEW BRAHLEK, SEONGSHIK OH, Rutgers, The State University of New Jersey — Topological insulators are band insulators in the bulk with gapless topologically protected surface states. Recently it has been predicted that 3-D topological insulators (TI) can host zero energy modes called Majorana fermions. Many theoretical proposals for observation of the zero energy excitations involve coupling between the surface states of TI and s-wave superconductors (SC). A prerequisite for such experiments is a highly tunable surface which is decoupled from the residual bulk carriers and well established coupling between TI and superconductor. Here we present transport measurements performed in high quality MBE grown thin films of Bi2Se3. Along with presenting evidence for significant contribution of the surface states to the electrical transport, we discuss the dependence of TI-SC coupling on temperature, gate voltage and thickness of TI films.

[1]Supported by Microsoft Station-Q program

Vladimir Orlyanchik
University of Illinois at Urbana-Champaign

Date submitted: 11 Nov 2011 Electronic form version 1.4