Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Bi_2Se_3 and Bismuth: A comparison of transport in topological and trivial materials[1] ANTHONY RICHARDELLA, Penn State University, MICHEL VAN MAASAKKERS, Eindhoven University of Technology, DUMING ZHANG, JOON SUE LEE, NITIN SAMARTH, Penn State University — The simple surface state structure of Bi2Se3 has made it one of the most promising materials for harnessing transport through topologically protected surface states. Identifying unambiguous signatures of transport through these states is difficult however due to residual bulk conductivity and the formation of 2D electron gases near the surface due to band bending. As in bulk bismuth these non-topological states are subject to strong-spin orbit coupling. Very thin films of bismuth are predicted to be 2D topological insulators and thus are interesting themselves for a topological to non-topological transition as a function of thickness. Analysis of signatures such as weak anti-localization and linear magnetoresistance are compared between high quality MBE grown films of these materials to determine what can and cannot be ascribed to transport through protected surface states.

[1]Supported by DARPA and NSF-MRSEC.

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Date submitted: 22 Nov 2011 Electronic form version 1.4