Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Electronic transport of Sb-doped Bi_2Se_3 topological insulator nanoribbons SEUNG SAE HONG, JUDY CHA, DESHENG KONG, YI CUI, Stanford University — Vapor-liquid-solid (VLS) grown nanoribbons, having large surface / volume ratio and high crystal quality, provide a unique opportunity to study topological insulator materials by electronic transport. However, clear observation of the surface states is often hindered due to materials' imperfections. Bulk impurities and environmental doping effects are known to contribute to dominant background transport signal, so that appropriate doping and surface protection are necessary to reduce the excess carriers. We report that Antimony (Sb), known to be an effective compensational dopant for bulk crystals, can be incorporated into Bi_2Se_3 nanoribbons and it reduces the bulk electron contribution significantly. With a Zinc Oxide protective layer, the carrier density of thin ribbons reaches below 10^{12}cm^{-2}. This talk will include magnetotransport studies and temperature dependant transport of nanoribbons as well.

Seung Sae Hong
Stanford University

Date submitted: 07 Dec 2011 Electronic form version 1.4