Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Growth of topological insulator Bi_2Se_3 thin films on amorphous for multi-channel structure SAHNG-KYOON JERNG, YONG SEUNG KIM, JAE HONG LEE, Sejong University, Korea, YOUNGWOOK KIM, JUN SUNG KIM, Pohang University of Science and Technology, Korea, KISU JOO, EUIJOON YOON, SANG-MOON YOON, MIYOUNG KIM, Seoul National University, Korea, SEUNG-HYUN CHUN, Sejong University, Korea — A topological insulator exhibits the topologically protected gapless Dirac surface states in bulk band gap which was predicted in Bi_2Se_3. Thin layered films of Bi_2Se_3 have been heteroepitaxially grown on the crystalline substrate by molecular beam epitaxy (MBE). Here, we show the growth of Bi_2Se_3 thin films on amorphous SiO_2 substrate by MBE. In order to achieve the growth on amorphous surface, van der Waals epitaxy method with the selenium passivation was adopted. Bi_2Se_3 films are grown along [001] direction with periodical structure in spite of lattice mismatched amorphous substrate. Low-temperature transport measurement revealed the weak anti-localization effect with electrical gating, which suggest that surface transport properties can be comparable to those of epitaxially grown Bi_2Se_3 films on crystalline substrate. In addition, we demonstrate the growth of multi-channel Bi_2Se_3 films separated by amorphous insulating layer. These results provide a potential of growth of layered topological insulator films on amorphous materials and junctions.

Sahng-Kyoon Jerng
Sejong Univ

Date submitted: 15 Nov 2013 Electronic form version 1.4