Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Controlling the 2DEG states evolution at a metal/Bi_2X_3 (X=Se,Te) interface HAN-JIN NOH, JINWON JEONG, EN-JIN CHO, Department of Physics, Chonnam National University, JOONBUM PARK, JUN SUNG KIM, Department of Physics, Pohang University of Science and Technology, ILYOU KIM, BYEONG-GYU PARK, Pohang Accelerator Laboratory, Pohang University of Science and Technology, HYEONG-DO KIM, Department of Physics and Astronomy, Institute for Basic Science — We have demonstrated that the evolution of the two-dimensional electron gas (2DEG) system at an interface of metal and the model topological insulator (TI) Bi_2X_3 (X=Se, Te) can be controlled by choosing an appropriate kind of metal elements and by applying a low temperature evaporation procedure. In particular, we find that only topological surface states (TSSs) can exist at a Mn/Bi_2X_3 interface, which would be useful for implementing a TI-based device with surface current channels only. The existence of the TSSs alone at the interface was confirmed by angle-resolved photoemission spectroscopy (ARPES). Based on the ARPES and core-level x-ray photoemission spectroscopy measurements, we propose a cation intercalation model to explain our findings.

Han-Jin Noh
Department of Physics, Chonnam National University

Date submitted: 06 Nov 2015 Electronic form version 1.4