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Aging effect on carrier density and mobility of thin film Bi_2Se_3 and Bi_2Te_3 grown on Al_2O_3 NIKESH KOIRALA, MATTHEW BRAHLEK, Rutgers University-Department of Physics and Astronomy, NAMRATA BANSAL, Rutgers University- Department of Electrical and Computer Engineering, SEONSHIK OH, Rutgers University-Department of Physics and Astronomy — Topological Insulators (TI) are materials with topologically protected metallic surface states and insulating bulk states. Bi_2Se_3 and Bi_2Te_3 are viable TI material as they posses bulk band gap as well as continuous surface band. However, there is bulk conduction as well in these materials due to Fermi surface lying in the bulk conduction band. Natural n-type doping due to ambient oxygen and water vapor and/or creation of Se/Te vacancies create bulk contamination, leading to change in carrier density and motility. We report transport measurement data on epitaxially grown thin films of these materials which show the dependence of charge carrier density and mobility on environmental exposure time of these samples. In addition, we will present our data on samples capped with various materials.

Nikesh Koirala
Rutgers University-Department of Physics and Astronomy

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