Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Low temperature magnetoresistance studies in MBE grown topological insulator thin films[1] RIK DEY, ANUPAM ROY, TANMOY PRAMANIK, SAMARESH GUCHHAIT, SUSHANT SONDE, AMRITESH RAI, SARMITA MAJUMDER, BAHNIMAN GHOSH, LEONARD REGISTER, SANJAY BANERJEE, Microelectronics Research Center, Univ of Texas at Austin — We studied low temperature magnetoresistance in molecular beam epitaxy grown topological insulator Bi_2Se_3 and Bi_2Te_3 thin films. The surface and structural characterization of the grown films showed smooth epitaxial growth on Si(111). The magnetoresistance has been measured at low temperatures (2 - 20 K) with magnetic fields upto 9 T. The full range perpendicular field magnetoresistance has been explained with the original Hikami-Larkin-Nagaoka theory. Altshuler-Aronov theory of localization has been used to understand the full range parallel field magnetoresistance. Various scattering times have been estimated by fitting the magnetoresistance data with the theory. It is shown that the Zeeman effect is not needed to explain the magnetoresistance and has not been considered in the theory either. The angle dependent anisotropic magnetoresistance has also been observed and explained using the above theories.

[1]This work is funded by NRI - SWAN.

Rik Dey
Microelectronics Research Center, Univ of Texas at Austin

Date submitted: 14 Nov 2014 Electronic form version 1.4