

Abstract Submitted  
for the MAR15 Meeting of  
The American Physical Society

**Defect induced negative magnetoresistance and surface state immunity in topological insulator BiSbTeSe<sub>2</sub>** KARAN BANERJEE, JAESUNG SON, PRAVEEN DEORANI, Natl Univ of Singapore, PENG REN, Nanyang Technological University, LAN WANG, RMIT University, HYUNSOO YANG, Natl Univ of Singapore — The absence of backscattering due to time reversal symmetry is one of the hallmark features of a topological insulator. However, the introduction of defects can result in diminishing the transport properties of topological insulators. In this work, we introduce defects into the topological insulator BiSbTeSe<sub>2</sub> by subjecting it to ion milling and study the effect of disorder on the transport properties. We find that a negative contribution arises in the magnetoresistance of BiSbTeSe<sub>2</sub> at low temperatures. However, the surface state remains remarkably robust to the introduction of disorder. We demonstrate that the negative magnetoresistance originates from an increase in the density of defect states created by the introduction of disorder. We also find the bulk contribution to remain negligible even after subjecting to ion milling.

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Date submitted: 13 Nov 2014

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