

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Magnetization in Intrinsic Topological Insulators Induced by Exchange Interaction with Ferromagnetic Insulator¹ VALERIA LAUTER, Oak Ridge National Laboratory, Oak Ridge, USA, FERHAT KATMIS, Francis Bitter Magnet Laboratory, MIT, Cambridge, USA, BADIH ASSAF, Ecole Normale Supérieure, Paris France, DON HEIMAN, Department of Physics, Northeastern University, Boston, USA, JAGADEESH MOODERA, Department of Physics, MIT, Cambridge, MA-02139, USA — We examine the magnetic proximity-induced symmetry breaking via the exchange interaction in heterostructures of the topological insulator (TI) Bi₂Se₃ and the ferromagnetic insulator (FMI) EuS [1]. We observed the emergence of a ferromagnetic phase in TI with the excess of magnetic moment at the interface using depth and element sensitive Polarized Neutron Reflectometry (PNR). We find that the magnetization, penetrating into the TI originates through exchange interaction, without structural perturbation at the interface. Due to the different interlayer exchange coupling as well as the properties of the bulk and surface magnetizations, we investigated several different heterostructures after cooling in zero field (ZFC) and in an external magnetic field (FC). The significantly enhanced magnetic properties of the heterostructures as revealed by the PNR studies, as well as the temperature and external magnetic field dependence will be presented.

[1] P. Wei, et al Phys. Rev. Lett. 110, 186807 (2013)

¹This work was supported by the Scientific User Facilities Division, BES, DOE, NSF ECCS-1402738, DMR-1207469, ONR N00014-13-1-0301.

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Date submitted: 14 Nov 2014

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