

Abstract Submitted
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Room Temperature Ferromagnetism on the Topological Insulators Surface by Proximity Effect FERHAT KATMIS, MIT, VALERIA LAUTER, Oak Ridge National Lab., VAHID SAZGARI, ISMET I. KAYA, Sabanci University, DONALD HEIMAN, Northeastern University, JAGADEESH MOODERA, MIT — Generating exchange-induced ferromagnetism on the surface of a topological insulator (TI) with a ferromagnetic layer (FM) provides a cleaner approach for realizing a ferromagnetic TI that may lead to exhibiting other quantum functionality.¹ Here we demonstrate further that room temperature magnetic state may be reached in the TI and FM heterostructures through magnetic proximity-induced time reversal symmetry breaking on the TI surface. Using different magnetic characterization methods we provide evidence of this enhanced proximity-induced magnetism in TI. We show that such effects persist up to room temperature, far above the Curie temperature of the FM, signifying a significantly different behavior in TI. The project supported by grants NSF (DMR-1207469), MIT MRSEC through the MRSEC Program of the NSF (DMR-0819762) and NSF (ECCS-1402738). 1. “Exchange-Coupling-Induced Symmetry Breaking in Topological Insulators”, Peng Wei, et al, PRL. 110, 186807 (2013).

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