

Abstract Submitted
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Probing interface ferromagnetism of EuS/Bi₂Se₃ heterostructures with magnetic second harmonic generation¹ CHANGMIN LEE, Department of Physics, MIT, FERHAT KATMIS, Francis Bitter Magnet Lab, MIT, PABLO JARILLO-HERRERO, Department of Physics, MIT, JAGADEESH S. MOODERA, Francis Bitter Magnet Lab and Department of Physics, MIT, NUH GEDIK, Department of Physics, MIT — Ferromagnet / topological insulator interfaces are novel heterostructures that can host various interesting physical phenomena, such as massive Dirac fermions, the quantum anomalous hall effect, and the topological magnetoelectric effect. By using magnetic second harmonic generation (MSHG), we separately measure the in-plane and the out-of-plane magnetization at the interface between a ferromagnetic insulator EuS and Bi₂Se₃. In contrast to bulk-sensitive linear magneto-optics, such as the Faraday and Kerr effects, MSHG allows a selective measurement of ferromagnetism and crystal symmetry of the interface, at which inversion symmetry is broken. Our technique can thus be used to study magnetism and crystal structure of such “buried” interfaces to which other conventional probes do not have direct access.

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