Abstract Submitted
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Surface States of Doped Topological Insulators with Superconducting and Magnetic Correlations[1] HAIM BEIDENKOPF, PEDRAM ROUSHAN, JUNGPIL SEO, Y.S. HOR, ROBERT J. CAVA, ALI YAZDANI, Princeton University — The proximity effects induced by superconducting and magnetic correlations are expected to alter the nature of the topological Dirac surface states. Certain schemes that involve the deposition of both a superconductor and a ferromagnet are predicted to allow the creation, detection, and manipulation of the elusive Majorana Fermionic excitations. In light of those suggestions, we studied the implications doping-induced bulk superconductivity and ferromagnetism has on the Dirac surface states of topological insulators. We utilized high resolution scanning tunneling microscopy and spectroscopy to measure the behavior on the surface of Bi_2Se_3 whose bulk turns superconducting when intercalated with Cu. We also investigated Mn doped Bi_2Te_3 that was recently shown to become ferromagnetic. Such magnetic impurities also relieve the spin-selective scattering dictated by the surface-state chirality, thus enabling backscattering of the Dirac fermions which is absent in stoichiometric Bi_2Te_3.

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