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Visualizing competing trends at topological surfaces[1] PAOLO SESSI, Physikalisches Institut, Experimentelle Physik II, Universitaet Wuerzburg, Am Hubland, D-97074 Wuerzburg, Germany, RUDRO BISWAS, Department of Physics and Astronomy, Purdue University, 525 Northwestern Avenue West Lafayette, Indiana, USA, THOMAS BATHON, Physikalisches Institut, Experimentelle Physik II, Universitaet Wuerzburg, Am Hubland, D-97074 Wuerzburg, Germany, ALEXANDER BALATSKY, Institute for Materials Science, Los Alamos New Mexico 87545, USA, MATTHIAS BODE, Physikalisches Institut, Experimentelle Physik II, Universitaet Wuerzburg, Am Hubland, D-97074 Wuerzburg, Germany — Topological insulators interacting with magnetic impurities are usually described within the framework of gapping the Dirac quasiparticles energy spectrum by time reversal symmetry breaking. However, the overwhelming majority of studies demonstrate the presence of finite density of states near the Dirac node even once the system becomes magnetic. The contradictory observations call for a better understanding of the nature of the mobility and transport in magnetically doped topological insulators. Here, by combining different experimental techniques with theoretical calculations, we map the response of topological states to magnetic impurities at the atomic scale and reveal that, contrary to what generally believed, gapless density of states and magnetic order can coexist.

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