

Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Observation of novel interference patterns in $\text{Bi}_2\text{Fe}_{1-x}\text{Te}_3$ by Fourier transform scanning tunneling spectroscopy (FT-STTS) YOSHINORI OKADA, Boston College, CHETAN DHITAL, WEN-WEN ZHOU, HSIN LIN, SUSMITA BASAK, ARUN BANSIL, YAOBO HUANG, HONG DING, ZIJIANG WANG, STEPHEN WILSON, VIDYA MADHAVAN — We utilize Fourier transform scanning tunneling spectroscopy (FT-STTS) to probe the surface of the magnetically doped TI, $\text{Bi}_2\text{-xFexTe}_3$. Our measurements show the appearance of a hitherto unobserved channel of electronic backscattering along the surface q -vector. By referencing the FT-STTS with angle-resolved photoemission spectroscopy (ARPES) data, we formulate a simple model showing that these new vectors are fully consistent with spin-flip scattering. Our combined data therefore present compelling evidence for the first momentum resolved measurement of enhanced backscattering due to magnetic impurities in a prototypical TI.

Yoshinori Okada
Boston College

Date submitted: 28 Nov 2010

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