

Abstract Submitted  
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**Probing Surface States of the Topological Insulator  $\text{Bi}_{1-x}\text{Sb}_x$  with Scanning Tunneling Microscopy and Spectroscopy** PEDRAM ROUSHAN, ANTHONY RICHARDELLA, COLIN PARKER, KENJIRO GOMES, ABHAY PASUPATHY, AAKASH PUSHP, YEW SAN HOR, ROBERT CAVA, ALI YAZDANI, Princeton University — There is a considerable interest in surface properties of  $\text{Bi}_{1-x}\text{Sb}_x$  alloys, for which there is growing evidence that they are topological bulk insulators with novel surface states [1]. We have used a cryogenic scanning tunneling microscope (STM) to probe the surface of  $\text{Bi}_{1-x}\text{Sb}_x$  directly, and confirming the presence of surface states within the bulk band gap. Energy resolved conductance mapping of these surface states reveal strong spatial modulations, similar to those observed with the STM for noble metal surface states [2]. Fourier analysis of these maps shows that the spatial modulation of the surface states can be understood within a model for scattering between various k-states of the band structure of the surface. We will present these results in connection with the angle-resolved photoemission measurements of the contours of constant energy. [1] D. Hsieh *et al.*, Nature **452**, 970 (2008) [2] M. F. Crommie *et al.*, Nature **363**, 524 (1993)

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