Abstract Submitted for the MAS15 Meeting of The American Physical Society

Probing Quantum Anomalous Hall Edge States in Cr doped (Bi,Sb)₂Te₃ Topological Insulators¹ ANTHONY RICHARDELLA, ABHINAV KANDALA, CHAOXING LIU, NITIN SAMARTH, The Pennsylvania State University — The quantum anomalous Hall (QAH) effect is one of the most dramatic demonstrations of the topological properties of topological insulators. Similar to the quantum Hall effect, magnetically doped topological insulators can show a quantized conductance but with no external applied field required. We discuss the growth of these materials by molecular beam epitaxy (MBE) and characterization of their structural and transport properties. While truly quantized conduction usually requires dilution fridge temperatures, there is much interest in trying to push this effect to higher temperatures. Defects and sample degradation from exposure to atmosphere or processing during device fabrication will be discussed. We also show that, using the unusual angular dependence of the anisotropic magnetoresistance (AMR) from tilted field measurements, contributions from bulk and edge transport can be separated. This gives us information about the scattering of electrons between bulk and edge channels that can be used to characterize how the transport evolves as a function of temperature.

¹We acknowledge support from DARPA MESO, ONR and ARO MURI

Anthony Richardella The Pennsylvania State University

Date submitted: 02 Oct 2015

Electronic form version 1.4