

Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Polarization Modulation THz TDS of Topological

Insulators¹ DEEPU GEORGE, CHASE ELLIS, Dept of Physics, SUNY Buffalo, TOBIAS KIESSLING, Universitat Wurzburg, JOHN CERNE, ANDREA MARKELZ, Dept of Physics, SUNY Buffalo, MARKELZ GROUP COLLABORATION, CERNE GROUP COLLABORATION — Optical hall conductivity measurements are powerful alternatives to DC transport measurements in samples in which the latter are challenging. They provide a deeper understanding of interactions in correlated systems and also serve as a measure of disorder in such systems. Aoki et al[1] has studied Quantum Hall Effect in graphene theoretically and has predicted that Optical Hall Conductivity should be measurable with an accurate detection of the Hall angle in the THz regime. Shimano et al [2] has reported evidence for Quantum Hall Plateau in the longitudinal conductivity σ_{xy} in the THz region in a 2DEG system. In this work, we have developed a new broadband technique which rapidly measures complex Faraday and Kerr angles. Our technique is capable of measuring the entire complex conductivity tensor with a single scan, with an accuracy of 5mRad in the frequency range 0.2 to 2.5THz. We have employed this to study topological insulators and have observed a magnetic field dependent absorption around 0.5THz. 1. Morimoto, T., Jour. of Phy: Conference Series, 2009. 150(2). 2. Ikebe, Y., et al., PRL, 2010. 104(25): p. 256802.

¹NSF MRI-R2 DBI2959989 NSF-DMR1006078

Deepu George
Dept of Physics, SUNY Buffalo

Date submitted: 11 Nov 2011

Electronic form version 1.4