Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

**Ultrafast Dynamics of Dirac Fermions in Topological Insulator Bi2Se3 using Mid-infrared pump and Terahertz probe spectroscopy** LIANG LUO, TIANQI LI, Dept of Physics and Astronomy, Iowa State Univ and Ames Lab, US-DOE, XINYU LIU, JACEK FURDYNA, Dept of Physics, University of Notre Dame, JIGANG WANG, Dept of Physics and Astronomy, Iowa State Univ and Ames Lab, US-DOE, DR WANG TEAM, DR LIU TEAM — Topological insulators (TIs) represent a new state of quantum matter, which attracts a lot of recent attentions due in part to the protected Dirac cone conducting state on its surface. One key current issue is to understand the high frequency electrodynamics and charge transfer mechanism of the Dirac state and the spatially separated bulk insulating state. Here we present our investigation of these issues using femtosecond mid-infrared (MIR) pump and Terahertz (THz) probe spectroscopy. Distinctly different dynamics of THz conductivity are observed with pumping below and above the bulk bandgap which allows to separate between bulk and surface contributions. The demonstrated approach provides a versatile and powerful spectroscopic tool to investigate the intrinsic Dirac fermion physics in 3D TIs..

Liang Luo
Dept of Physics and Astronomy, Iowa State Univ and Ames Lab, US-DOE

Date submitted: 15 Nov 2013 Electronic form version 1.4