Abstract Submitted
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Terahertz studies and colossal Kerr rotation in the topological insulator Bi_2Se_3[1] ROLANDO VALDÉS AGUILAR, A.V. STIER, L. WU, L.S. BILBRO, W. LIU, N.P. ARMITAGE, Department of Physics & Astronomy, Johns Hopkins University, Baltimore, MD 21218, N. BANSAL, M. BRAHLEK, S. OH, Department of Physics & Astronomy, Rutgers University, Piscataway, NJ 08854, D.K. GEORGE, J. CERNE, A.G. MARKELZ, Department of Physics, SUNY Buffalo, Buffalo, NY 14260 — We report a study of high quality MBE grown Bi_2Se_3 topological insulator thin films using time domain terahertz spectroscopy (TDTS). We explicitly demonstrate the 2D character of the response by studying films of different thicknesses. In addition, we take advantage of a unique feature of TDTS that allows to measure the time structure of the THz pulses. In this way we measure the Faraday and Kerr rotation angles in a single experiment. We find an unprecedentedly large value of the Kerr rotation that is due to the cyclotron resonance of the 2D Dirac fermions [2]. We will also show results on the effect of exposure of the thin films to atmospheric conditions for prolonged periods of time.

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[2]R. Valdés Aguilar, *et al.* Arxiv:1105.0237.

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