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THz spectroscopy of electric field modulated topological insulator, Bi_2Se_3. MINTU MONDAL, Johns Hopkins University, MARYAM SALEHI, Rutgers, The State University of New Jersey, CHENG WAN, DIPANJAN CHAUDHURI, NICHOLAS LAURITA, BING CHENG, MICHAEL QUINTERO, Johns Hopkins University, JISOO MOON, DEEPTI JAIN, PAVEL SHIBAYEV, Rutgers, The State University of New Jersey, TYREL MCQUEEN, Johns Hopkins University, SEONGSHIK OH, Rutgers, The State University of New Jersey, PETER ARMITAGE, Johns Hopkins University, RUTGERS, THE STATE UNIVERSITY OF NEW JERSEY TEAM, JOHNS HOPKINS UNIVERSITY TEAM — Topological Insulators (TIs) belong to a class of materials that exhibit topologically protected conducting surface states with a Dirac like dispersion, with an insulating bulk. This novel class of materials shows a variety of interesting phenomena including a quantized magneto-electric effect and novel spin textures at the surface. They may have enormous potential for applications. However, in real topological insulators, the bulk is fairly conducting and the chemical potential lies inside the conduction band, which gives great difficulties to study their properties. In this talk, I will present the THz response of Dirac surface states of the topological insulator, Bi_2Se_3 modulated by gate voltage. To tune the chemical potential, we have used well known ionic liquid gel techniques as top gate. As a function of gate voltage, we have observed significant change in conductance which allows us to study the magneto-electric effect through measurement of Faraday and Kerr rotation close to Dirac point.

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