

Abstract Submitted
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Infrared induced Hall conductivity measurement of the surface state in 3D TI: experimental development SEONGPHILL MOON, Natl High Magnetic Field Lab / Florida State University, YANG XU, IRENEUSZ MIOTKOWSKI, YONG P. CHEN, Purdue University, DMITRY SMIRNOV, Natl High Magnetic Field Lab — Recently, it has been experimentally demonstrated that irradiation of circularly polarized light with the below-resonant frequency, smaller than the bulk band gap of the 3D TI, can open up a band gap at the Dirac point on the surface state[1]. It is predicted that by shining CP light the quantum hall-like transport phenomena can be observed on the surface of the 3D TI[2]. For doing so, the Fermi level of 3d TI should be placed in between bulk band gap, such as BiSeTeSb₂(BSTS)[3]. Inspired by these experimental and theoretical works, we developed the experimental set-up to study out-of-equilibrium magneto-transport of the surface state of 3D TIs under the circularly polarized mid infrared radiation provided by tunable quantum cascade lasers. A detailed description of the experimental apparatus and first results of infrared induced Hall conductivity measurements on BiSeTeSb₂ will be presented. [1] K. H. Wang, et al., Science 342, (2013) 453. [2] T. Kitagawa, et al., Phys. Rev. B 84, (2011) 235108 [3] Yang Xu, et al., Nat. Phys.**10**, (2014) 956–963

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