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Bias dependence of h/e and h/2e Aharonov-Bohm oscillations in topological insulators[1] PRAMEY UPADHYAYA, FAXIAN XIU, YABIN FAN, IGOR OVCHINNIKOV, KANG WANG, University of California Los Angeles, UNIVERSITY OF CALIFORNIA LOS ANGELES TEAM — Recently Aharonov-Bohm (AB) oscillations were observed in Bi_2Se_3 nanoribbons by Peng *et al.* [1] as a direct evidence for the existence of surface states in topological insulator. However, the resistance showed only h/e oscillations with a minimum in resistance at zero flux while the ballistic and diffusive theory predicts either h/e oscillations with a maximum in resistance at zero flux or h/2e oscillations with a minimum in resistance at zero flux respectively [2]. A possible explanation of the results of Peng *et al.* was given in the theory of disordered topological insulators proposed by Bardarson *et al* .[2] and Zhang *et al.* [3] where they attributed the results of Peng *et al.* to presence of weak disorder. Furthermore authors of [2] and [3] studied dependence of h/e and h/2e oscillations on disorder strength and doping using their proposed theory. In this work we look at the effect of doping by studying bias dependence of AB oscillations using a gated device and observe both h/e and h/2e oscillations whose relative strength depends on the applied bias and compare the proposed theory of ref. [2] and [3] with the experimental results. [1] H. Peng, *et al.* Nature Mater. 9, 225 (2010).[2] J. Bardarson, *et al*, Phys. Rev. Lett. 105, 156803 (2010).[3] Y. Zhang and A. Vishwanathan, Phys. Rev. Lett. 105, 206601 (2010).

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