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Spin Circuit Representation of Spin Pumping in Topological Insulators[1] KUNTAL ROY, Purdue University — Earlier we developed spin circuit representation of spin pumping and combined it with the spin circuit representation for the inverse spin Hall effect to show that it reproduces the established results in literature [1]. Here we construct the spin circuit representation of spin pumping in topological insulators. The discovery of spin-polarized surface states in three-dimensional (3D) topological insulators (TIs) with strong spin-orbit coupling is promising for the development of spintronics. There is considerable bulk conduction too in 3D TIs (e.g., Bi_2Se_3) apart from possessing the surface states. We utilize the spin circuit model for spin orbit torques in topological insulator surface states [2] to develop the equivalent circuit model of spin pumping in topological insulators. Such equivalent circuit model developed here can be utilized to analyze available experimental results and evaluate more complex structures. [1] K. Roy et al., Spin Circuit Representation for Spin Pumping Phenomena, in APS March Meeting, Session Y28.12 (2015). [2] S. Hong, Spin Circuit Model for Spin-Orbit Torque in 2D Channels, in APS March Meeting, Session G52.1 (2015).

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