Giant tunneling anomalous Hall conductance in topological insulators[1] ALEX MATOS-ABIAGUE, BENEDIKT SCHARF, JONG E. HAN, State University of New York at Buffalo, EWELINA M. HANKIEWICZ, University of Würzburg, IGOR ZUTIC, State University of New York at Buffalo — We theoretically investigate the tunneling transport across a magnetic barrier modulated by a top gate potential on the surface of a three-dimensional topological insulator. In the presence of a magnetization component along the bias direction, a finite tunneling anomalous Hall conductance (TAHC), transverse to the applied bias, develops. Depending on the strengths of the magnetization and gate potential, the system can exhibit a giant anomalous Hall angle, with the TAHC exceeding the longitudinal tunneling conductance. Moreover, we predict the existence of a negative differential TAHC even when the longitudinal differential conductance remains positive.

Igor Zutic
State University of New York at Buffalo

Date submitted: 05 Nov 2015   Electronic form version 1.4