

Abstract Submitted
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Spin-momentum helical locking induced spin-valve effects in topological insulator/ferromagnet heterostructures¹ LAN WANG, BIN XIA, CHANG KE, PENG REN, PENG LIU, HAIBIN SU, ALFRED HUAN, Nanyang Technological University — Topological insulator is composed of an insulating bulk state and an odd number of massless spin-helical Dirac cone formed two dimensional surface state. Here we report a novel spin-valve effect in $\text{Bi}_{1.5}\text{Sb}_{0.5}\text{Te}_{1.8}\text{Se}_{1.2}/\text{CoFe}$ heterostructures. This effect indicates the spin-momentum helical locking on the $\text{Bi}_{1.5}\text{Sb}_{0.5}\text{Te}_{1.8}\text{Se}_{1.2}$ topological surface state. It is also indicated that the characteristics of helical surface can be preserved at topological insulator/ferromagnet interface although the ferromagnetism can break the time reversal symmetry and therefore generate an energy gap at the topological Dirac cone.

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