Charge-Spin Conversion in Topological Insulators

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In this talk, we examine the potential of topological insulators as spin-current source materials. Using a new spin-polarized tunneling device configuration, large charge-spin conversion efficiency in topological insulators is revealed, well exceeding that in conventional magnetic tunnel junctions. Through a comparative study between Bi_2Se_3 and $(Bi,Sb)_2Te_3$, we verify the topological-surface-state origin of the observed large spin signals and further extract the energy dependence of the effective spin polarization in Bi_2Se_3. Opportunities and challenges for applying topological insulators to MRAM will be also discussed.

BIO: Ching-Tzu Chen is a Research Staff Member at the IBM Thomas J. Watson Research Center. She has participated in various projects related to iron-pnictide superconductivity, graphene nanostructures, graphene spintronics, and spin-orbit physics since joining IBM. Her work on iron-pnictide superconductivity and graphene has been awarded the IBM Outstanding Achievement Award and Invention Achievement Award. Her most recent research focuses on spin-orbit coupling and magnetic exchange interaction in quasi-2D systems and magnetic heterostructures for spintronic applications.