MAR13-2013-021075

Abstract for an Invited Paper
for the MAR13 Meeting of
the American Physical Society

The spin Hall effect in transition metal-ferromagnetic material bilayer devices

CHI-FENG PAI, Cornell University

The strong spin-orbit interaction from certain heavy metal/ferromagnetic material bilayer systems has been shown to be intense enough to drive the magnetization into steady dynamics and/or magnetic switching via spin transfer torque mechanism. The spin Hall effect, which describes the generation of a transverse spin current from a longitudinal charge current, plays an important role in these bilayer devices that typically contain a heavy transition metal underlayer. Here we demonstrate that the spin Hall effect induced spin transfer torque (SHE-STT) from Ta and W based systems can be utilized to control the magnetization direction in magnetic tunnel junctions through a three-terminal device architecture. We also demonstrate DC current induced dynamics in the magnetic layer due to the SHE-STT in these three-terminal devices.