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Spin Transfer in Magnetic Nano Devices with Perpendicular Anisotropy JIAN-PING WANG, HAO MENG, Electrical Engineering, University of Minnesota — Spin transfer predicted by Slonczewski and Berger has attracted a great deal of attention in recent years. Experimental findings have proved spin transfer in current-perpendicular-to-plane (CPP) spin-valves (SV) and magnetic tunnel junctions (MTJs) with in-plane magnetization configuration. MRAM cells with perpendicular magnetic anisotropy may support high recording density than that using shape anisotropy with in plane magnetization configuration. However, there is no report on spin transfer in any magnetic nano device with perpendicular anisotropy. In this work, perpendicular magnetized spin transfer nano-devices with sub-200 nm dimensions: Si/SiO_2/bottom electrode/[CoFe2.5Å/Pt15 Å]$_m$/CoFe5 Å /Cu30 Å /[CoFe4.5 Å /Pt23 Å]$_n$/Top electrode, has been fabricated and tested. Two [CoFe/Pt]$_n$ multilayers with different coercivities are used as the free layer and fixed layer in nano-devices. CPP magnetoresistive (MR) loop tested under perpendicular magnetic field shows the GMR is around 0.47%. The switching field for the free layer is around 200 Oe. Current induced magnetization switching was realized with a positive switching current 48 mA and a negative switching current -62 mA, respectively. Furthermore, field dependence of the switching current will also be demonstrated.

Hao Meng
Electrical Engineering, University of Minnesota

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