Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

**Spin Torque Arising from the Spin Hall Effect within Ferromagnets** JONATHAN GIBBONS, Department of Physics, Cornell University, ROBERT BUHRMAN, School of Applied and Engineering Physics, Cornell University, DANIEL RALPH, Department of Physics, Cornell University — Recent spin-pumping measurements have indicated that ferromagnetic materials such as permalloy can possess a significant inverse spin Hall effect, by which they convert an applied spin current to a charge current. We report experimental investigations of the inverse phenomenon, using the direct spin Hall effect within a ferromagnetic material to generate a spin current that can be used to apply a spin transfer torque to another nearby magnetic layer. Specifically, we measure spin-orbit-induced torques generated by an in-plane current in pinned ferromagnet/spacer/free ferromagnet multilayer structures. We quantify the strength of the torque using both non-resonant second harmonic magnetization tilting measurements and spin-torque ferromagnetic resonance. We focus on the dependence of the direction and strength of the spin torque on the relative orientation of the fixed-layer magnetization and the current.

Jonathan Gibbons
Cornell University

Date submitted: 14 Nov 2014 Electronic form version 1.4