

Abstract Submitted
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Observation of spin Hall effective field XIN FAN, JUN WU, YUN-PENG CHEN, MATTHEW JERRY, Department of Physics and Astronomy, University of Delaware, HUAIWU ZHANG, State Key Laboratory of Electronic Films and Integrated Devices, University of Electronic Science and Technology of China, JOHN XIAO, Department of Physics and Astronomy, University of Delaware — Recent development in spin Hall driven spin transfer torque has attracted intensive interests¹. Liu *et. al.* has shown that the spin transfer torque induced by the spin Hall effect in a normal metal-ferromagnetic metal bilayer can switch the magnetization of the ferromagnetic layer, which may be a potential candidate for magnetic random access memory². The switching of the magnetization was primarily attributed to the Slonczewski torque³. We show that besides the Slonczewski torque, the spin Hall effect also produces an effective field that can also facilitate the magnetization reversal. This effective field persists even with a Cu spacer layer, and reduces quickly with the increase of the ferromagnetic layer thickness. The observation of the spin Hall effective field shall have ramification on the understanding of both spin transfer torque and spin Hall effect. 1. K. Ando *et. al.*, Electric manipulation of spin relaxation using the spin Hall effect, *Physical Review Letters*, 101, 036601 (2008). 2. L. Liu *et. al.*, Spin-Torque Switching with the Giant Spin Hall Effect of Tantalum. *Science* 336, 555-558 (2012). 3. J. Slonczewski, Current-driven excitation of magnetic multilayers. *Journal of Magnetism and Magnetic Materials*, 159, L1-L7 (1996).

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