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Imaging Nano- and Micrometer-sized Magnetic Insulator Devices in the Presence of Spin-Torque AARON ROSENBERG, Stanford University, COLIN JERMAIN, Cornell University, KATJA NOWACK, Stanford Institute for Materials and Energy Sciences, JOHN KIRTLEY, Stanford University, HAN-JONG PAIK, SRIHARSHA ARADHYA, Cornell University, HAILONG WANG, Ohio State University, JOHN HERON, DARRELL SCHLOM, Cornell University, FENGYUAN YANG, Ohio State University, DAN RALPH, Cornell University, KATHRYN MOLER, Stanford University — Recent results demonstrate that a giant spin-hall effect in Tantalum can produce large spin torques. We intend to employ this large spin torque to manipulate the magnetic moment in electrically insulating ferrimagnetic $Lu_3Fe_5O_{12}$ (LuIG) and $Y_3Fe_5O_{12}$ (YIG) devices. Using a scanning SQUID microscope, we can study the possibility of performing reversible switching between magnetic states of nano- and micrometer-sized iron garnet devices induced by current pulses applied to a Tantalum layer in contact with the devices by directly imaging the magnetic state of the device before and after a current pulse. Successful manipulation of magnetic insulators by electrical pulses can be a platform for magnetic memory devices and spintronics.

Aaron Rosenberg
Stanford University

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