Abstract Submitted
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Scanning-SQUID investigation of spin-orbit torque acting on yttrium iron garnet devices[1] AARON J. ROSENBERG, Stanford University, COLIN L. JERMAIN, SRIHARSHA V. ARADHYA, Cornell University, JACK T. BRANGHAM, Ohio State University, KATJA C. NOWACK, Cornell University, JOHN R. KIRTLEY, Stanford University, FENGYUAN YANG, Ohio State University, DANIEL C. RALPH, Cornell University, KATHRYN A. MOLER, Stanford University — Successful manipulation of electrically insulating magnets, such as yttrium iron garnet, by by current-driven spin-orbit torques could provide a highly efficient platform for spintronic memory. Compared to devices fabricated using magnetic metals, magnetic insulators have the advantage of the ultra-low magnetic damping and the elimination of shunting currents in the magnet that reduce the torque efficiency. Here, we apply current in the spin Hall metal β-Ta to manipulate the magnetic orientation of micron-sized, electrically-insulating yttrium iron garnet devices. We do not observe spin-torque switching even for applied currents well above the critical current expected in a macrospin switching model. This suggests either inefficient transfer of spin torque at our Ta/YIG interface or a breakdown of the macrospin approximation.

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