Abstract Submitted
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Magnetization reversal in orthogonal spin transfer magnetic devices[1] GEORG WOLF, ANDREW D. KENT, Dept. of Physics, New York University, New York, NY 10003, BARTEK KARDASZ, MUSTAFA PINARBASI, Spin Transfer Technologies Inc., Fremont, CA 94538 — Orthogonal spin transfer (OST) magnetic devices have distinct magnetization dynamics and switching characteristics compared to conventional collinearly magnetized devices. A perpendicular magnetized layer provides a large initial spin torque on the free layer magnetization and thus initiates magnetization dynamics. In order to read out the information stored in the OST device, the free layer forms a magnetic tunnel junction with an in plane magnetized reference layer, which also exerts a spin torque on the free layer. The combination of those two spin torques leads to different switching dynamics of the free layer. Quasistatic and fast pulsed measurements have been conducted to explore the state diagram and magnetization dynamics of such devices. The absolute value of the switching current I_s is in general smaller for the antiparallel (AP) to parallel (P) transition, due to the angular dependence of the reference layer torque. I_s also has a weak field dependence for this transition, indicating that the reference layer torque governs this transition. On the other hand, the P to AP transition shows a stronger field dependence of I_s and occurs for both current polarities. Both these features denote the influence of the spin-torque generated from the perpendicular polarizer.

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