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Magnetic propeller driven by spin transfer[1] WENG LEE LIM, NICHOLAS ANTHONY, ANDREW HIGGINS, SERGEI URAZHDIN, Department of Physics, West Virginia University, Morgantown WV 26506 — Spin-transfer devices usually contain two magnetic layers in which the thicker layer polarizes the electron current and the thinner layer experiences dynamics due to spin transfer. However, both magnetic layers can polarize current and experience simultaneous dynamics when the thickness of magnetic layers is similar (symmetric nanopillars). We investigated current-driven magnetization switching in *symmetric* nanopillars with structure $Ni_{80}Fe_{20}$= Py(4nm)/Cu(3.5nm)/Py(4nm). Time-resolved measurements of resistance for both directions of current and magnetic field showed reversible switching of magnetization between parallel (P) and anti-parallel (AP) states with unusual dependence on the current. We observed that the dwell times displayed two different dependences on the current I for different values of applied field H. At large H, the dwell time in the P state t_P decreases with increasing I while the dwell time in the AP state t_{AP} increases, similarly to asymmetric devices. However, at small H, both t_P and t_{AP} decrease with increasing I. We explain this unusual behavior by a thermal activation model involving four-cycle sequential reversal of two magnetic layers.

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