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Spin torque switching and precession states in a spin Hall effect systems with perpendicularly magnetized ferromagnetic layer[1] SHU YAN, YAROSLAW BAZALIY, Department of Physics and Astronomy, University of South Carolina — Magnetic switching in spin Hall effect (SHE) systems attracted some recent attention. Those bilayer systems consist of a perpendicularly polarized ferromagnetic (F) layer next to a non-magnetic metallic (N) layer with large SHE. A dc electric current flow along the layers was found to cause magnetic switching. One of the theoretical explanations proposed for this phenomenon is based on the emergence of a spin torque due to the spin polarized current coming from the N-layer into the F-layer. The latter current is produced by the SHE in N-layer. We study the influence of the external magnetic field on the current induced switching. It is shown that depending on the direction of the field the astroid curve describing magnetic switching can experience either a quantitative deformation, or a qualitative change with the emergence of stable precession cycles. These predictions allow us to suggest new test experiments designed to further probe the spin torque theory of SHE switching.

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