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Measurements of out-of-plane dynamics induced by spin transfer in magnetic nanopillars[1] WENG LIM, West Virginia Unviersity, SERGEI URAZHDIN, West Virginia University — Current-induced spin transfer (ST) can induce dynamical states in magnetic multilayer nanopillars not accessible by any other techniques. For-in plane magnetic field, the predicted dynamical regimes include elliptical, clamshell, and out-of-plane precession. The first two regimes have been demonstrated and extensively analyzed. However, the out-of-plane precession has so far been elusive. Calculations [1] show that dynamical coupling between ferromagnets due to ST can result in suppression of coherent out-of-plane precession in nanopillars with a patterned polarizing layer, which is the geometry studied so far. We will discuss our measurements of current-induced dynamics in nanopillars with extended polarizer, in which the decoherence caused by the coupling between magnetic layers is minimized. We demonstrate coherent out-of-plane precession, whose dependence on current and the direction of the magnetic field is consistent with micromagnetic simulations. Most surprisingly, our data are asymmetric with respect to reversal of the magnetic field, which is explained by a combination of the Oersted field and sample shape imperfections. [1] S. Urazhdin, Phys. Rev. B 78, 060405(R) (2008).

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