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Spin-transfer induced vortex dynamics with non-standard angular dependence torque PAOLO BORTOLOTTI, NICOLAS LOCATELLI, VINCENT CROS, JULIE GROLLIER, CNRS/Thales, Palaiseau, France, RITA MACHEDO, RICARDO FERREIRA, SUSANA CARDOSO, INESC-MN, Lisbon, Portugal, ALBERT FERT, CNRS/Thales, Palaiseau, France — Microwave emissions driven by spin-transfer were firstly observed on FeNi/Cu/FeNi pillars (standard samples) characterized by uniform magnetization. Interestingly, by tuning the spin accumulation profile, i.e., choosing Co/Cu/FeNi pillars with opportune ratio of thickness/spin diffusion length (non-standard samples), it is possible to obtain strong modification of the torque angular dependence and, more generally, of the magnetization dynamics itself. Eventually, oscillations at zero applied field were observed for these non-standard pillars, again for uniform magnetization. However, when a large current density is applied, the uniform hypothesis is broken and vortex states are favoured. In this work we want to stress that non standard-angular dependence, obtained for such Co/Cu/FeNi samples, plays an important role also for vortex dynamics. By the combined study of static and dynamic response, we can discriminate among all possible combinations of vortex chiralities and polarities. The evolution with field and current of such configurations clearly differs from samples with standard spin-torque angular dependence, resulting in a different dynamics for such non-standard samples.

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