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Bipolar High Field Excitations in Co/Cu/Co Nanopillar Junctions[1] B. ÖZYILMAZ, W. CHEN, A. D. KENT, Department of Physics, NYU, M. J. ROOKS, J. Z. SUN, IBM Research — Spin transfer has been studied in Co/Cu/Co pillar devices (PD) in large fields applied perpendicular to the layers and as a function of magnetic layer thickness. Sub-100 nm size junctions have been fabricated by means of a nano-stencil mask process in combination with an in-situ wedge growth mechanism. The junctions consist of a thick'fixed' Co layer and thin (0.5 to 3 nm) 'free' Co layer. At high current densities excitations, which lead to a decrease in junction resistance, are observed for both polarities of the current [1]. Our results suggest that current-induced excitation of the magnetization can lead to a lower resistance state than that of a state of static parallel alignment of the layers. Intrinsic asymmetries of bilayer junctions in conjunction with lead asymmetries cause a strong asymmetry in the longitudinal spin accumulation (LSA). Recently it has been found that at high current densities such asymmetries in the LSA can cause non-uniform spin- wave excitations even in PDs with only a single ferromagnetic layer [2]. Here we compare the thickness dependence of these additional excitations in single layer junction with that of the free layer thickness dependence of the bilayer junctions.

[1] B. Özyilmaz et al. cond-mat/0407210.
[2] PRL,93, 176604 (2004).

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