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Spin-Transfer Effect in Py/Al/Py Nanopillar Spin Valves A. G. F. GARCIA, I. N. KRIVOROTOV, P. M. BRAGANCA, D. C. RALPH, R. A. BUHRMAN, Cornell University — In order to understand the relation between giant magnetoresistance (GMR) and spin transfer effects, we compare spin-transfer-induced switching in spin valve nanopillars with Al and Cu spacer layers. The spin valve trilayer consisted of a Py 20nm / Al (Cu) 12nm / Py 5.5nm (4.5nm) with a nominal configuration of a 40nm by 120nm ellipse. Measurements of resistance vs. applied field and resistance vs. DC current were taken. Our measurements show that the Al/Py interface exhibits drastically different spin-dependent scattering properties as compared to Cu/Py interface resulting in a significant decrease of GMR by factor of 10 in the Py/Al/Py spin valves. Surprisingly, this dramatic decrease of GMR is not accompanied by a large increase in the critical current for spin-transfer-induced switching. Our observations suggest that spin-transfer torque and GMR are not always simply inverse proportional to each other, and thus spin torque measurements can give information on spin-dependent transport properties of magnetic multilayers that is complementary to the GMR measurements.

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