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Large reduction of the depinning field for a transverse domain wall under application of rf and dc currents P.J. METAXAS, A. ANANE, V. CROS, J. GROLLIER, C. DERANLOT, F. PETROFF, A. FERT, Unite Mixte de Physique CNRS/Thales and Universite Paris Sud 11, 1 Ave Augustin Fresnel, Palaiseau 91767, France, C. ULYSSE, G. FAINI, CNRS, Phynano team, LPN, route de Nozay, 91460 Marcoussis, France — A new generation of proposed spintronic devices are based on domain wall (DW) motion (DW-MRAM, DW logic, racetrack memory...). However, reliable depinning of domain walls remains elusive, especially in zero field. Here, we have studied the combined effect of rf and dc currents on the depinning of transverse walls in the soft NiFe layer of a 100 nm wide Co/Cu/NiFe spin valve wire. Using the GMR effect, we ensure that the domain wall is always prepared at the same intrinsic defect and then measure the depinning field for different applied dc and rf currents. Notably, for a narrow range of rf frequencies at around 3GHz, we evidence a strong reduction in the depinning field (from ∼80 Oe to ∼30 Oe). Our results are suggestive of a very efficient resonant depinning effect in our spin valve wire which depends not only on the rf power but also on the polarity and amplitude of the accompanying dc current.

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