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Interactions between domain walls and spin currents M. KLAUI, M. LAUFENBERG, D. BACKES, W. BUHRER, U. RUDIGER, Fachbereich Physik, University of Konstanz, Germany, L. VILA, C. VOUILLE, G. FAINI, LPN - CNRS, Maroussis, France — A promising novel approach for switching magnetic nanostructures is current-induced domain wall propagation (CIDP), where due to a spin torque effect, electrons transfer angular momentum to a head-to-head domain wall and thereby push it in the direction of the electron flow without any externally applied fields. This effect has been observed with a variety of techniques including MFM [1] and spin polarized scanning electron microscopy [2] to directly observe current-induced domain wall propagation in ferromagnetic nanostructures and magnetoresistance measurements to systematically probe the critical current densities as a function of the geometry [3]. The observed wall velocities and critical current densities, where wall motion sets in at room temperature, do not agree well with theoretical 0K calculations [4]. We have therefore measured the critical current densities as a function of the sample temperature. We find that the spin torque effect becomes more efficient at low temperatures, which could account for some of the observed discrepancies between the 300K experiment and the 0K simulation. [1] A. Yamaguchi et al., Phys. Rev. Lett. 92, 77205 (2004); [2] M. Klaui et al., PRL 95, 26601 (2005); [3] M. Klaui et al., PRL 94, 106601 (2005); [4] A. Thiaville et al., EPL 69, 990 (2005); G. Tatara et al., APL 86, 252509 (2005);

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