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Ratchet Effects and Domain Wall Energy Landscapes in Amorphous Magnetic Films with 2D Arrays of Asymmetric Holes J.I. MARTIN, A. ALIJA, I. SOBRADO, A. PEREZ-JUNQUERA, G. RODRIGUEZ-RODRIGUEZ, M. VELEZ, J.M. ALAMEDA, U. Oviedo-CINN, Oviedo, Spain, V.I. MARCONI, U. Nacional de Cordoba, Argentina, A.B. KOLTON, C. Atomico Bariloche, Argentina, J.M.R. PARRONDO, U. Complutense, Madrid, Spain — The driven motion of domain walls in extended magnetic films patterned with 2D arrays of asymmetric holes has been found to be subject to two different crossed ratchet effects [1] which results in an inversion of the sign of domain wall motion rectification as a function of the applied magnetic field. This effect can be understood in terms of the competition between drive, elasticity and asymmetric pinning as revealed by a simple ϕ^4-model. In order to optimize the asymmetric hole design, the relevant energy landscapes for domain wall motion across the array of asymmetric holes have been calculated by micromagnetic simulations as a function of array geometrical characteristics. The effects of a transverse magnetic field on these two crossed ratchet effects will also be discussed in terms of the decrease in domain wall energy per unit area and of the modifications in the magnetostatic barriers for domain wall pinning at the asymmetric inclusions. Work supported by Spanish MICINN.[1] A. Perez-Junquera et al, Phys. Rev. Lett. 100 (2008) 037203

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