Latin-American Magnetism Association



Gabriela Pasquini

Laboratorio de Bajas Temperaturas, Departamento de Física, FCEyN Universidad de Buenos Aires; IFIBA, CONICET, Argentina

"Magnetic-domain-wall AC dynamics in ultrathin ferromagnetic films."

The dynamics of domain walls (DWs) under external magnetic fields reveals a complex behavior where sample disorder plays a key role. Furthermore, the response to alternating magnetic fields has only been explored in limited cases and analyzed in terms of the constant field solution acting in flat interfaces. In this talk I present results obtained by magneto-optical imaging the evolution of magnetic DWs in ultrathin ferromagnetic films with perpendicular anisotropy, under the application of AC magnetic fields within the creep regime. Whereas the DC characterization is well predicted by an elastic flat interface model, unexpected features are observed under the application of alternating square pulses in bubble micrometer-sized magnetic domains [1]: We show that under a zero bias AC field there is a striking bubble area reduction, concomitant with a roughness domain wall increase, with further evolution to strongly distorted shapes. We propose an analytical model [2], based on the curvature induced symmetry breaking, able to quantitatively explain the intriguing "rectification effect". A qualitative explanation of the enhancement of large scale dynamic roughening is also proposed.

[1] P. Domenichini, C. P. Quinteros, M. Granada, S. Collin, J.-M. George, J. Curiale, S. Bustingorry, M. G.
Capeluto, and G. Pasquini, Phys. Rev. B 99 (2019).

[2] P. Domenichini, F. Paris, M. G. Capeluto, M. Granada, J.-M. George, G. Pasquini and A. B. Kolton, submitted

to Phys. Rev. B letters, arXiv:2012.09377 (2021).











