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Confinement distance of the closure structure around a single hole in a 2D magnetic thin film[1] M. VELEZ, G. RODRIGUEZ-RODRIGUEZ, H. RUBIO, A. PEREZ-JUNQUERA, J.I. MARTIN, J.M. ALAMEDA, Dpto. Fisica, Univ. Oviedo-CINN, 33007 Oviedo, Spain, J.V. ANGUITA, IMM-CNM-CSIC, 28760 Madrid, Spain — One common feature in many magnetic nanostructures, such as nanorings or patterned thin films [1], is the existence of non magnetic holes within the magnetic material. However, up to now, the simple problem of a a single non magnetic hole in a 2D magnetic film has received little attention, even though it is qualitatively different from the blade domains that appear around holes in 3D magnetic material. In this work [2] this basic problem has been analyzed in detail by magnetic force microscopy, micromagnetic simulations and an analytical model. The closure magnetization configuration can be described by two -1/2 half vortices located at the hole edge along the easy anisotropy axis, and confined within a distance L that is determined by the minimization of magnetostatic and anisotropy energies constrained by the magnetic charge conservation within the system. [1] A. Perez-Junquera et al, J. Appl. Phys. 99 (2006) 033902 [2] G. Rodriguez-Rodriguez et al, Phys. Rev. B (2008) in press.

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