MORPHOLOGY DEPENDENT CAPPING LAYER EFFECTS IN ULTRA-THIN Co FILMS AND NANOPARTICLES

C. Clavero[1], *J. M. García-Martín*[1], *A. García-Martín*[1], *Y. Huttel*[2], *E. Navarro*[3], *A. Cebollada*[1], *G. Armelles*[1]

1 Instituto de Microelectrónica de Madrid (CNM-CSIC), Isaac Newton 8-PTM, 28760 Tres Cantos, Madrid, Spain.
2 Instituto de Ciencia de Materiales de Madrid (ICMM-CSIC), 28029 Cantoblanco, Madrid, Spain.
3 *Departamento de Física de los Materiales, Facultad de Físicas, Universidad Complutense, 28040 Madrid, Spain.*

cesarcl@imm.cnm.csic.es

New systems with tailored magnetic and magneto-optical properties can be designed by adequate synthesis of ultra-thin magnetic films and nanoparticles, capped with different metallic layers. The use of matrices with different dielectric tensors modifies the electronic confinement conditions inside the nanoparticles, and therefore can modify the optical and magneto-optical activity of the systems. In addition, in some non magnetic metallic capping layers like Pt and Au deposited on magnetic elements, it has been observed the onset of magnetic polarization in the atomic layers closer to the ferromagnetic element, much stronger in the case of Pt. The capping layer polarization leads to the magnetic coupling of the nanoparticles and induces an increase of the magneto-optical activity in the systems, allowing to control both their magnetic and their magneto-optic properties.

References:

[1] E. Navarro, Y. Huttel, C. Clavero, A. Cebollada, and G. Armelles, Phys. Rev. B **69**, 224419 (2004).
[2] E. Navarro, Y. Huttel, C. Clavero, G. Armelles, and A. Cebollada, Appl. Phys. Lett. **84**, 2139 (2004).)) Abstract
[3] C. Clavero et al. to be published.

Figures:

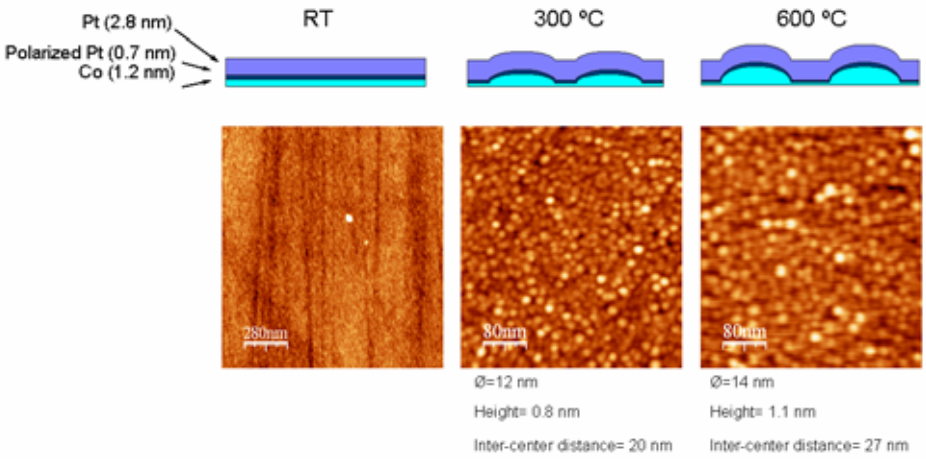

Fig. 1. AFM images and sketches corresponding to a Pt capped Co ultra-thin films sputtering deposited at RT and Pt capped nanoparticles deposited at 300 and 600 ºC.