XXXII Panhellenic Conference on Solid State Physics and Materials Science
Conference Center "Carolos Papoulias", 18-21 September 2016, Ioannina, Greece

Magnetic properties of FePt films in CD and Si patterned substrates

S. Karamanou[1], M. Vasilakaki[1], G. Giannopoulos[1], K. N. Trohidou[1], D. Niarchos[1]
[1] *Institute of Nanoscience and Nanotechnology,NCSR Demokritos,Aghia Paraskevi,Greece*

Abstract: FePt magnetic thin films have attracted a lot of attention for many decades [1], because of their interesting physical properties. Magnetic anisotropy, magnetization switching processes, its high saturation magnetization and coercivity are examples of the most investigated properties of single thin films or multilayers for magnetic recording applications [2].
We have prepared FePt thin films deposited on CD-prepatterned and Si patterned substrates using the magnetron sputtering technique and we measured their magnetic properties. We found that their coercive field and magnetic anisotropy strongly depend on substrate and the deposition conditions [3].
Monte Carlo simulations with the Metropolis algorithm [4] replicate very well the observed magnetic behaviour. The developed model well explains the role of the interparticle interactions through exchange and dipole-dipole coupling between the moments of FePt grains and predicts the optimum conditions for the magnetic recording applications.

References
[1]B. Ghebouli, A. Layadi A. Guittoum, L. Kerkache, M. Benkerri, A. Klimov, V. Preobrazhensky, and P. Pernod, Eur. Phys. J. Appl. Phys. 48, 30503 (2009)
[2]. Z.H. Wang, K. Chen, Y. Zhou, H.Z. Zeng, Ultramicroscopy, 105, 343, (2005)
[3] M. Mebarki, A. Layadi, A. Guittoum, A. Benabbas, B. Ghebouli, M. Saad, N. Menni, Applied Surface Science. 257, 7025, (2011)
[4] C. Binns, KN Trohidou, J.Bansmann, et al. J. Phys. D 38, R357 (2005)