

Abstract Submitted
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Highly ordered FePd magnetic thin films¹ ROSA LUKASZEW, University of Toledo, CESAR CLAVERO, Institute of Microelectronics in Madrid, MUKUT MITRA, University of Toledo, ALFONSO CEBOLLADA, Institute of Microelectronics in Madrid — The study of magnetic materials constrained to very small sizes is important under both fundamental and applied points of view. One of the challenges that the magneto-recording industry currently faces is that the ever increasing demands for higher storage density is reaching fundamental limitations such as the super-paramagnetic limit (i.e. thermal fluctuations can “flip” the magnetization in the nano-magnets). One possibility to overcome this problem is to use nano-magnets made of materials that exhibit high magnetic anisotropy. Highly ordered L1₀ alloys of FePd and FePt exhibit such strong perpendicular anisotropy. We are currently studying highly ordered FePd and FePt thin films deposited on MgO substrates. We have studied the deposition conditions and post-deposition treatments that allowed us to obtain significant highly ordered phase. We will present our correlated XRD, magneto-optical as well as AFM/MFM studies on highly ordered FePd thin films. We will also show systematic studies on films of varying thickness in the 5-30 nm range. In particular we will show how different capping materials (i.e. Pd versus MgO) have an important effect on the magnetic and magneto-optical properties of the films.

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Rosa Lukaszew
University of Toledo

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