MA 31 Magnetic Measuring Techniques

Time: Thursday 16:15–17:00 Room: HSZ 103

MA 31.1 Thu 16:15 HSZ 103

GMI effect and anisotropy in soft magnetically coated wires — •J. Velleuer[1], A.G. Munoz[2], H. Yakabchuk[1], C. Schiefer[1], A. Hackl[1], and E. Kisker[1] — [1]Institut für Angewandte Physik, Heinrich-Heine Universitä Düsseldorf, 40225 Düsseldorf — [2]Dept. of Mat. Sci., LKO, University of Erlangen-Nuremberg, 91058 Erlangen

The impedance of soft magnetic microwires strongly depends on an external magnetic field (GMI). Here, we investigate the GMI effect of Cu wires coated with a soft magnetic layer. The layer thickness and the annealing conditions are varied. Depending on these parameters a GMI effect of up to 1100% was observed.

In order to gain further knowledge about the magnetic anisotropy in these wires -besides the GMI effect- the Procopiu effect was also investigated. The Procopiu effect (also known as the inverse Wiedemann effect) manifests itself in the occurrence of an AC voltage on a solenoid wrapped around the wire, when an AC current is flowing through the wire and an external magnetic field is applied.

MA 31.2 Thu 16:30 HSZ 103

Extracting the intrinsic switching field distribution in perpendicular media: a comparative analysis — •Michael Winklhofer[1,2] and Gergely Zimanyi[1] — [1]Physics Departement, UC Davis, CA, USA — [2]Geophysics Section, LMU, Munich

The quality of recording media depends crucially on the intrinsic (microscopic) switching-field distribution (SFD) of the media particles, which determines both magnetic stability and attainable recording density. We introduce a new method based on the first-order-reversal-curve (FORC) diagram to extract the SFD of perpendicular recording media (PRM). To demonstrate the viability of the method, we micromagnetically simulated FORCs (recoil loops) for PRM with known SFD and compare the extracted SFD with the SFD obtained by means of two different methods that are based on recoil loops, too, which however rely on mean-field approximations and assumptions on the shape of the SFD. The FORC method turns out to be the most accurate algorithm over the technologically relevant range of magnetic quality factors ($Q = 2K/(\mu_0 M_s^2)$), where the other methods overestimate the width of the SFD [1]. Moreover, the FORC method directly renders the shape of the SFD, without having to make *a priori* assumptions on its shape, and allows one to test if and to what degree the underlying assumption model of square hysterons is met.

[1] Winklhofer M., Zimanyi G.T., cond-mat/0509074

MA 31.3 Thu 16:45 HSZ 103

Theoretical contributions to the analysis of XMCD spectra — •Fabian Dörfler[1], Christos Kostoglou[1], Matej Komelj[2], and Manfred Fähnle[1] — [1]MPI Metallforschung, Heisenbergstr. 3, D-70569 Stuttgart — [2]Josef Stefan Institute, Jamova 39, SI-1000 Ljubliana, Slovenia

In the first part of the talk we will discuss under what circumstances the so called ground state moments, introduced by van der Laan [1] for atomic multiplet configurations, can be obtained also for atoms in a solid from the shape of the measured XMCD spectra. Starting from an isolated atom in a very strong crystal field, we will comment on the ground state moment analysis of XMCD spectra in solids suggested by Goering et al. [2].

In the second part of the talk the influence of the mixing of the $2p_{1/2}$ and $2p_{3/2}$ core levels by the crystal field or by the exchange field experienced by the core electrons is discussed, with special emphasis on the system CrO_2.

[1] G. van der Laan, Phys. Rev. B 55, 8086 (1997)
[2] E. Goering et al., Appl. Phys. A 78, 855 (2004)