MA 19.8 Mo 12:15 TU EMH225

DOMAIN PROPAGATION IN ION BOMBARDED MAGNETIC WIRES WITH OPPOSITE EXCHANGE BIAS — •K. Theis-Bröhl[1], B. P. Toperverg[1], J. McCord[2], U. Rücker[3], J. Schmalhorst[4], V. Höink[4], H. Brückl[4], T. Weis[5], D. Engel[5], A. Ehresmann[5], and H. Zabel[1] — [1]Department of Experimental and Solid State Physics, Ruhr-University Bochum, 44780 Bochum — [2]Material Research Institute, Helmholtzstr. 20, 01169 Dresden — [3]Institute of Solid State Research, Forschungszentrum Jülich, 52425 Jülich — [4]Department of Physics, University Bielefeld, Universitätsstr. 25, 33615 Bielefeld — [5]Faculty of Physics, Kaiserslautern University of Technology, 67663 Kaiserslautern

Exchange biased CoFe/MnIr films are magnetically patterned with He-ion bombardment into two magnetic regions (stripes) with oppositely aligned exchange bias. The longitudinal magnetization reversal occurs through head-on domain wall motion and partial penetration of magnetization from neighboring stripes. It is highly asymmetric and involves ripple-like domain structures and incoherent rotation of magnetization. This was measured using Kerr microscopy and polarized neutron reflectivity methods. For the quantitative analysis of our data we applied a theoretical model using the Distorted Born Wave Approximation which provides us with a set of parameters quantifying the magnetization arrangement in the magnetic pattern. This all together gives access to a detailed understanding of the magnetization arrangement and the magnetization reversal. We acknowledge funding by DFG, SFB 491 and BMBF 032AE8BO.

MA 19.9 Mo 12:30 TU EMH225

SOFT MAGNETIC PROPERTIES OF Fe-Cr-Mo-Ga-P-C-B BMG — •Stoica Mihai[1], Roth Stefan[1], Rellinghaus Bernd[1], Schultz Ludwig[1], and Eckert Jürgen[2] — [1]IFW Dresden, Institute for Metallic Materials, P.O. Box 270016, D-01171 Dresden, Germany — [2]Physical Metallurgy Division, TU Darmstadt, Petersenstraße 23, D-64287 Darmstadt, Germany

The $Fe_{65.5}Cr_4Mo_4Ga_4P_{12}C_5B_{5.5}$ bulk metallic glass (BMG) exhibits good soft magnetic properties. However, the maximum achievable diameter of this Fe-based BMG is limited to only a few millimeters. Amorphous rods with diameters of 1.5-3 mm and discs with diameters and thicknesses of 10 mm and 1 mm, respectively, were prepared by copper mold casting. The coercivity of the as-cast rods and disc is around 5 A/m and it decreases to less than 1 A/m upon annealing. The saturation polarization is around 0.8 T at room temperature, increasing to up to 1 T at 77 K.

On the other hand, powder metallurgical methods (i.e. ball milling combined with subsequent consolidation of the resulting powders) provide the advantages to prepare bulk amorphous samples with larger sizes and a large variety of shapes. The present contribution aims at comparing the magnetic properties of the as-prepared and annealed bulk metallic glasses obtained by copper mold casting and powder metallurgy, respectively.

MA 19.10 Mo 12:45 TU EMH225

Magnetic multilayers on nanospheres — •Ildico Guhr[1], Till Ulbrich[1], Guohan Hu[2], Johannes Boneberg[1], Günter Schatz[1], and Manfred Albrecht[1] — [1]University of Konstanz, Department of Physics, 78457 Konstanz, Germany — [2]Hitachi San Jose Research Center, San Jose, CA 95120, USA

Nanoparticle media using arrays of monodisperse nanoparticles with high magnetic anisotropy are assumed to be the ideal future magnetic recording media [1]. However, key requirements like control of the magnetic anisotropy orientation along with magnetic domain isolation have not been achieved so far. Here, we report on a combination of a two-dimensional topographic pattern formed of self-assembled polystyrene particles [2] with sizes as small as 20 nm and magnetic film deposition. The so formed nanostructures on top of a sphere are monodisperse and reveal a uniform magnetic anisotropy which can be tailored by changing the stack of a Co/Pd multilayer film and the deposition angle. Magnetic exchange isolation depends strongly on the total film thickness and the particle size as observed by MFM imaging and MOKE studies. Moreover, results on the switching mechanism as a function of nanostructure size will be presented.

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[1] M. Albrecht et al., Physik Journal, 10 (2003).
[2] F. Burmeister et al., Appl. Surf. Sci. 144-145, 461 (1999).

MA 20 Poster:Schichten(1-29),Spintrsp(30-45),Ex-Bias(46-63),Spindyn(64-75),Mikromat.(76-80),Cluster(81-94),Abbv.(95-99),Obflm(100-02),SpElek.(103-09),E-Theo(110-14),Mikromag.(115-16),Spin+PÜ(117-26),Mag.Mat.(127-51),Meth.(152-55),Mol.Mag(156-59),Kondo(160-65

Zeit: Montag 14:00–18:00 Raum: Poster TU C

MA 20.1 Mo 14:00 Poster TU C

Pulsed laser deposition of electron-doped $La_{1-x}Ce_xCoO_3$ thin films — •Dirk Fuchs[1], Peter Adelmann[1], Peter Schweiss[1], Thorsten Schwarz[1,2], and Rudolf Schneider[1] — [1]Forschungszentrum Karlsruhe, Institut für Festkörperphysik, D-76021 Karlsruhe, Germany — [2]Universität Karlsruhe, Fakultät für Physik, D-76128 Karlsruhe, Germany

The electron doping of $LaCoO_3$ perovskites with the substitution of trivalent La^{3+} by tetravalent Ce^{4+} ions is usually strongly limited by the small solubility of Ce under standard conditions. With thin film preparation we succeeded in the growth of highly cerium-doped thin films. $La_{1-x}Ce_xCoO_3$(LCCO) thin films, with $0.1 \leq x \leq 0.5$, were deposited by laser ablation using a KrF excimer laser. The deposition was carried out from polycrystalline LCCO targets prepared by the sol-gel route and standard solid state reaction. The film growth was studied as a function of the substrate temperature and material, laser energy and oxygen partial pressure. The films were optimised with respect to crystalline quality. The magnetic and electric properties of the samples were characterized by magnetization and resistivity measurements.

MA 20.2 Mo 14:00 Poster TU C

Unusual finite-size scaling behavior of $La_{0.7}Sr_{0.3}CoO_3$ thin films — •Thorsten Schwarz[1,2], Dirk Fuchs[1], Peter Schweiss[1], and Rudolf Schneider[1] — [1]Forschungszentrum Karlsruhe, Institut für Festkörperphysik, D-76021 Karlsruhe — [2]Universität Karlsruhe, Fakultät für Physik, D-76128 Karlsruhe

$La_{0.7}Sr_{0.3}CoO_3$ thin films were prepared by pulsed laser deposition on (001) oriented $(LaAlO_3)_{0.3}(Sr_2AlTaO_8)_{0.7}$ substrates with different film thickness, 400 nm > d ≥ 2.6 nm, and optimized with respect to their structural and magnetic properties. We carried out X-ray diffraction, transmission electron microscopy, Rutherford-backscattering spectrometry and energy dispersive X-ray absorption analysis in order to check the structural quality and chemical composition of the samples. The magnetic and electric properties were characterized by dc-SQUID and transport measurements, respectively. The microstructure and film magnetization seem to be homogeneous over the whole film thickness. Impurities or precipitations could not be observed. The decrease of the magnetic ordering temperature, T_C, with decreasing d, reflects finite-size effects with a critical scaling exponent of $\lambda \approx 1$, which is usually only expected for the 2 dimensional Ising model. Nearly the same scaling behavior was obtained for $La_{0.7}Ca_{0.3}CoO_3$ and $La_{0.7}Ba_{0.3}CoO_3$ thin films.

MA 20.3 Mo 14:00 Poster TU C

La-doping in epitaxial thin films of $La_xSr_{2-x}CrWO_6$ — •Robert Geissler, Petra Majewski, Stephan Geprägs, Andrea Boger, Andreas Erb, Matthias Opel, Lambert Alff, and Rudolf Gross — Walther-Meißner-Institut, Bayerische Akademie der Wissenschaften, Walther-Meißner-Str. 8, 85748 Garching

Ferromagnetic double perovskites show high Curie temperatures T_C up to 600 K. For the system Sr_2FeMoO_6 ($T_C \approx 420$ K), it was shown that electron doping via the substitution of Sr^{2+} by La^{3+} increases T_C by about 80 K in polycrystalline samples [1]. For Sr_2CrWO_6, the synthesis of bulk samples of electron doped $La_xSr_{2-x}CrWO_6$ is difficult because of the preferential formation of $LaCrO_3$. However, due to the