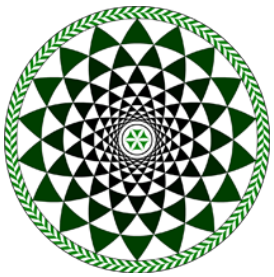

Contribution ID: **31** Type: **poster presentation**

Magnetic anisotropy and magnetization reversal mechanisms of nanoporous Co/Pd multilayers and CoPd alloy thin films

Tuesday, 4 July 2017 19:10 (2 hours)

In present work we demonstrate that magnetic anisotropy and magnetization reversal mechanism of Co/Pd thin films is highly dependent on the substrate morphology in submicron scale. Nanoporous lattice of holes, called antidots, were fabricated by deposition of Co/Pd multilayers on anodized aluminum oxide (AAO), where the pores are located in the middle of hexagonal packed hemispherical deepenings.

The studies concern the properties of as deposited films and annealed in vacuum at 300°C. To determine the contribution of pore morphology to magnetic properties of the systems, Co/Pd MLs on flat Si substrates was also prepared. SEM imaging confirmed nanoporous morphology of the films. Perpendicular magnetic anisotropy was observed for continuous films ($K_{\mathrm{eff}} \approx 2 - 4 \cdot 10^6$ erg/cc) and conserved for antidots before and after annealing ($K_{\mathrm{eff}} \approx 0.5 - 1 \cdot 10^6$ erg/cc). MFM imaging of Co/Pd multilayers and CoPd alloy compared to continuous films showed more complex magnetic contrast with smaller magnetic domains. The difference in MFM images can be explained by the pinning effect of the magnetic domains on the pore borders and edges of pore cells.

Magnetic reversal mechanism of continuous Co/Pd multilayers is based on domain-wall motion and can be described by modified Kondorsky model. For nanostructured films the transition of magnetization reversal mechanism to coherent rotation mode was observed and can be approximated by Stoner-Wohlfarth model.

The support from the NCN grant 2014/13/N/ST8/00731 is acknowledged.

Primary author: Mr CHOJENKA, Juliusz (Institute of Nuclear Physics Polish Academy of Sciences, Kraków, Poland)

Co-authors: Mr MAXIMENKO, Alexey (Institute of Nuclear Physics Polish Academy of Sciences, Kraków, Poland); Dr ZARZYCKI, Arkadiusz (Institute of Nuclear Physics Polish Academy of Sciences, Kraków, Poland); Prof. MARSZAŁEK, Marta (Institute of Nuclear Physics Polish Academy of Sciences, Kraków, Poland); Dr ZABILA, Yevhen (Institute of Nuclear Physics Polish Academy of Sciences, Kraków, Poland)

Presenter: Mr CHOJENKA, Juliusz (Institute of Nuclear Physics Polish Academy of Sciences, Kraków, Poland)

Session Classification: Poster Session

Track Classification: Surfaces and interfaces