

Kieler Woche 2019

Internationale Gastvorträge

auf dem Campus

Dienstag, 25. Juni 2019

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Electrochemical Approaches to Control the Magnetism of Ultrathin Films

Electrical gating of magnetism or voltage control (VCM) has emerged as a promising approach to address individual components in magnetic memories and logic devices as well as an efficient method to reduce the power consumption necessary to reverse the magnetization direction and/or displace magnetic domains. The phenomenon was first observed in 2007 by Weisheit al. who showed that the magnetic anisotropy energy (MAE) of an ultrathin magnetic layer is modified by application of an electric field.¹

The lecture will present and discuss our approaches to control the MAE of ultrathin epitaxial magnetic films in contact with an electrolyte. Our specificity is growing the magnetic layers of a few atomic planes by electrodeposition ² in an electrochemical cell installed on the magnetometer, which ensures control of its structure, morphology and surface chemistry. The use of the solid / electrolyte interface offers specific advantage to study VCM since there exists a large and uniform electric field ($> 1\text{V/nm}$) at the interface. It will be shown that electrochemical VCM encompasses very different physical mechanisms and recent results about the voltage dependence of domain wall propagation velocity will be also discussed. Analogies and differences with respect to solid state devices will be highlighted.

(1) Weisheit, M., Fahler, S., Marty, A., Souche, Y., Poinignon, C., Givord, D., Electric Field-Induced Modification of Magnetism in Thin-Film Ferromagnets, *Science*, **2007**, *315*, 349-351.

(2) Allongue, P., Maroun, F., Electrodeposited Magnetic Layers in the Ultrathin Limit, *MRS Bulletin*, **2010**, *35*, 761-770.

Der Vortrag beginnt um **16:00 Uhr** im
Hörsaal A des Audimax (CAP2)

Gastgeber: Prof. Olaf Magnussen **Institut für Experimentelle und Angewandte Physik**
Prof. Rainer Herges **Otto-Diels Institut für Organische Chemie**