

PHYSIKALISCHES KOLLOQUIUM

Mittwoch, 30.10.2013, um 17:15 Uhr

Ort: Reichenhainer Str. 90; Neues Hörsaalgebäude, Raum: 2/N113



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Magnetization dynamics in periodically modulated nanostructures

Periodical arrangements of magnetic nanostructures offer very exciting and new features that do not exist in thin films. They range from dipolar interactions leading to two-magnon scattering in periodically perturbed films to the opening of magnonic band gaps in a magnonic crystal acting as e.g. filters - analog to a photonic crystal.

I will present experimental data from ferromagnetic resonance (FMR) experiments of two types of periodic nanostructures, which depict the transition region from a thin film to an array of separated magnetic elements. The structures were created (i) by ion beam erosion in a self-organizing process or (ii) by local magnetic property patterning using ion beam implantation in conjunction with lithographic masks. Both methods allow for easy tailoring of the magnetic dimensions.

The FMR data shows a splitting of the uniform resonance mode into several modes due to the dipolar stray fields of the nanostructures, which can be imaged by transmission electron holography. The results are corroborated by an analytical perturbation theory of two-magnon scattering developed by P. Landeros and D.L. Mills. This extended model allows for calculating the resonance response function of 1D and 2D periodically perturbed ferromagnetic films in almost perfect agreement to the FMR experiments.

Alle Zuhörer sind ab 17:00 Uhr zum Kaffee vor dem Hörsaal eingeladen.