

# Structure-property relation in granular L1<sub>0</sub>-FePt media

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Based on their high uniaxial magneto-crystalline anisotropy of  $K_U = 6.6 \text{ MJ/m}^3$  granular L1<sub>0</sub>-ordered FePt-C films are seen as promising material candidates for future hard disk media. Aberration-corrected high-resolution transmission electron microscopy (HRTEM) and vibrating sample magnetometry (VSM) are used to correlate the structural and magnetic properties of these films. HRTEM images in plan view geometry reveal a bimodal distribution of the particle size ( $\bar{D} = 5.9 \text{ nm}$ ) while cross-sectional images are used to determine the orientation of the particles' easy axes and of the underlying MgO seed crystal relative to the substrate normal. The texture spread of the [001] easy axes is roughly  $3^\circ$  and thus larger than the misalignment of the MgO crystals which can be ascribed to the nucleation of FePt growth at MgO step edges [1]. The magnetic analyses exhibit a high anisotropy field of  $\mu_0 H_A = 9.2 \text{ T}$  and a weak dipolar coupling between the matrix-separated nanomagnets.

## References:

[1] S. Wicht et al., J. Appl. Phys. **114**, 063906 (2013)