

## **The influence of experimental parameters on contrast formation in magnetic force microscopy**

F. Krause, F. Kaisinger, H. Starke, G. Persch and U. Hartmann

Remanent magnetization  $M_r$  and coercivity  $H_c$  are important parameters of magnetic thin film discs. A matrix of different values of  $M_r$  and  $H_c$  is investigated in order to study the influence of these parameters on the magnetic force microscopy (MFM) signal. MFM images of high-density bit structures in longitudinal storage media show several unexpected features, such as improved image contrast of structures of a certain bit length, depending upon the tip-sample separation. These effects are not affected by remanent magnetization and coercivity. A simple model for magnetic contrast formation is introduced. The influence of tip-sample separation, tip shape and tilt angle on the imaging of bit structures is demonstrated. Several bit structures are imaged by MFM. The images are compared with the results of the theoretical approach.