

Improvements of the lateral resolution of the MFM technique

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We report on the preparation of high-resolution magnetic force microscopy (MFM) tips using the electron beam deposition method for MFM measurements on soft magnetic samples. Electron beam lithography using a scanning electron microscope was used to define small particles of magnetic material at the very end of a commercial scanning microscope tip to achieve maximum lateral resolution with low magnetic moment. Several approaches were tried out and demonstrated on permalloy thin films. The achieved resolution (down to 20 nm) is clearly proven by the fact that more details of the magnetic structure can be observed. However, it turned out that no standard exists in order to reliably determine the resolution of the MFM measurements; the development of such a standard will be a very important new task.