

## **Magnetic Force Microscopy**

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Magnetic force microscopy (MFM) is a technique related to atomic force microscopy (AFM) [1]. A ferromagnetic microprobe is attached to a highly flexible cantilever beam, and the sample is mounted on a three-dimensional piezo translator (Fig. 1). Magnetostatic interactions of the scanning probe with the sample are detected through microscopic lever deflections and are converted into an electrical voltage by a deflection sensor. A feedback loop then allows operation of the microscope in a constant force mode or, alternatively, in a constant-compliance mode. Various schemes for the detection of magnetostatically-induced cantilever deflections are summarized in Figure 2. The ultimately obtained force sensitivity is limited by thermal fluctuations and amounts to several pN under ambient conditions. The basic instrumentation can be considered as largely optimized.