

Abstract Submitted
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Magnetic Particle Imaging with a Cantilever Detector JACOB ALLDREDGE, JOHN MORELAND, NIST — We present a novel detection scheme for magnetic nano and micro particles using a magnetic force microscope (MFM) that allows for the local measurement of AC magnetic susceptibility. The method makes use of the nonlinearities in the magnetic response of a particle that come from its intrinsic magnetic susceptibility as well as its interaction with the surrounding environment. We excite the particle at subharmonic frequencies of the resonator detector to minimize cross talk similar to Magnetic Particle Imaging (MPI) (Gleich B, Weizenecker, J. Nature 435, 1214 2005) although here a cantilever acts as a detector instead of a tuned coil. This allows for the detection and characterization of magnetic particles with high signal to noise and low distortion making it ideal for characterizing magnetic nanoparticles over larger distances compared to typical scanned probe tip-sample separation. It also allows for the reconstruction of the local susceptibility curve.

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