

Abstract Submitted
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Ferromagnetic Resonance Force Microscopy (FMRFM): Magnetostatic modes in the presence of a localized tip field RADOVAN URBAN, ALEXANDER PUTILIN, California Institute of Technology, Pasadena, CA 91125, PHILIP WIGEN, California Institute of Technology, Pasadena, CA 91125, Ohio State University, Columbus, OH 43210, MICHAEL CROSS, MICHAEL ROUKES, California Institute of Technology, Pasadena, CA 91125 — Magnetostatic modes of Yttrium Iron Garnet (YIG) films have been investigated by ferromagnetic resonance force microscopy (FMRFM). A probe magnet on the tip of a compliant cantilever introduces inhomogeneity in the internal field of the YIG sample. The local variation of this internal field creates a perturbation upon the sample's magnetostatic modes analogous to either a potential barrier or well, depending on the mutual orientation of the external dc and the tip field. For antiparallel orientation of the external and tip field, localization of the magnetostatic modes can be observed. This allows one to extract local magnetic properties of ferromagnetic samples in spite of the strong spin-spin interaction. The lateral resolution of localized modes scales with size of the probe magnet. Data from our experiments is in excellent agreement with the theoretical predictions based upon the Landau-Lifshitz-Gilbert equation of motion and Maxwell's equations.

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