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Influence of the magnetic tip in ferromagnetic resonance force microscopy

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Abstract

We compare mechanically detected ferromagnetic resonance spectra for different separations h between the magnetic tip and sample surface. When the bias field generated by the tip is smaller than a few hundred gauss, the prominent changes are shifts of the entire spectrum (without line shape distortions) to higher frequency as h decreases. These results are in agreement with the Damon and Eshbach model for spin waves propagating in a potential perturbed by the additional field of the probe magnet. It is used to predict the spatial resolution limit for magnetostatic modes bounded by the stray field of the tip. The answer is $\sim 4\mu\text{m}$ for yttrium iron garnet. © 2002 American Institute of Physics.

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