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Ferromagnetic resonance force microscopy of a permalloy film E. NAZARETSKI, I. MARTIN, J.D. THOMPSON, R. MOVSHOVICH, Los Alamos National Laboratory, D.V. PELEKHOV, P.C. HAMMEL, P. WIGEN, Ohio State University, M. ZALALUTDINOV, SFA Inc., T. MEWES, University of Alabama, J. BALDWIN, B. HOUSTON, Naval Research Laboratory — We describe Ferromagnetic Resonance Force Microscopy (FMRFM) experiments performed on a 50 nm thick permalloy film. We have studied the evolution of the FMRFM force spectra as a function of temperature. The temperature-dependent studies show a decrease of the ferromagnetic resonance field with increasing temperature which we attribute to the temperature-dependent changes of the saturation magnetization. The experiments demonstrate the potential of FMRFM to study temperature dependent ferromagnetic resonance phenomena. We analyzed the FMRFM force spectra evolution as a function of the probe-film distance and performed numerical simulations of the intensity of the FMRFM probe-sample interaction force. Excellent agreement between the experimental data and the simulation results provides the new insight into the mechanism of the FMR mode excitation in an FMRFM experiment.

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