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Magnetic Resonance Force Microscopy investigations of a continuous ferromagnetic thin film J. KIM, The Ohio State University, T. MEWES, University of Alabama, F. YANG, The Ohio State University, P. WIGEN, The Ohio State University, YU. OBUKHOV, The Ohio State University, D. PELEKHOV, The Ohio State University, P. C. HAMMEL, The Ohio State University — The ferromagnetic resonance of a 50nm thick Permalloy film has been investigated using a magnetic resonance force microscope operated at UHV and 4K. A low boron doped silicon cantilever with a hardmagnetic SmCo tip attached to its end was used to detect the locally excited ferromagnetic resonance in the film. The high coercivity of the tip magnet enables the measurement of FMRFM spectra with the tip magnetization aligned either parallel or antiparallel to the external magnetic field, while saturating the Permalloy film perpendicular to the film plane. The variation of the spectra as a function of the tip-film separation reveals a bulk resonance and the excitation of spin waves originating where the magnetic resonance condition is locally met. This local resonance may be used to characterize the dynamic properties of ferromagnetic thin film samples with high spatial resolution.

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