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Two dimensional spectroscopic imaging of individual ferromagnetic nanostripes ROBERT MCMICHAEL, HAN-JONG CHIA, Center for Nanoscale Science and Technology, NIST, Gaithersburg MD, LYUBA BELOVA, Dept. of Matls. Science & Eng., Royal Institute of Technology, Stockholm —
We report on high resolution imaging of the center and edge modes of individual Permalloy nanostripes using ferromagnetic resonance force microscopy (FMRFM). Fabrication of future spintronic devices requires an understanding of how edge damage affects a device's magnetic properties, and the highly localized edge modes of a nanostripe provide a direct method to investigate edge properties. While previous studies have measured spectra of the edge modes in large arrays of stripes, in this work we use FMRFM to image and probe the center and edge modes in individual NiFe stripes, 400 and 700 nm in width and 20 nm in thickness. Our spectroscopic measurements reveal different resonance fields for opposite edges of a stripe, which also exhibit different structural profiles. 2-D spatial imaging of the bulk and edge mode resonances demonstrates the inhomogeneity of the edge modes along their lengths with a resolution of 300 nm.

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