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FMR Study of an Eightfold Artificial Quasicrystal[1] LANCE DE LONG, VINAYAK BHAT, Department of Physics and Astronomy, University of Kentucky, JOSEPH SKLENAR, Department of Physics and Astronomy, Northwestern University, BARRY FARMER, JUSTIN WOODS, Department of Physics and Astronomy, University of Kentucky, JOHN KETTERSON, Department of Physics and Astronomy, Northwestern University, TODD HASTINGS, Department of Electrical and Computer Engineering, University of Kentucky — We have performed DC magnetization, and broad-band and narrowband FMR measurements on eightfold-rotationally-symmetric artificial quasicrystals. Permalloy films of thickness 25 nm were patterned with 1^{st} and 4^{th} generation ***Ammann tilings*** (AT) [1] using standard electron beam lithography. The AT can be viewed as an antidot lattice of squares and rhombi whose edges are film segments of length 1000 nm (7 μm), and width 130 nm (910 nm), respectively, in 4^{th} (1^{st}) generation AT. In spite of clear DC magnetization hysteresis in the low-field regime, we observed remarkably sharp and reproducible FMR spectra (including both the low-field-reversal and the saturated regimes) that strongly reflected the geometry of the AT. The applied DC field **H** could be oriented in-plane at an angle φ with respect to a AT reference axis. Our FMR spectra exhibit the expected eight-fold symmetry of the AT for experimentally accessible RF frequencies (7 to 18.5 GHz). Static and dynamic micromagnetic simulations were in good agreement with our experimental FMR spectra.

[1] B. Grünbaum and G. C. Shephard, *Tilings and Patterns* (Freemann, New York, 1986).

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