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High Frequency Excitation of Nanometer-Scale, Strongly Coupled FM / NM / FM Disks[1] JAVIER PULECIO, PETER WARNICKE, SHAWN POLLARD, DARIO ARENA, YIMEI ZHU, Brookhaven National Laboratory — There is great interest in the manipulation of magnetic domains in nanostructures from both a fundamental and applications perspective. In particular, the use of resonant frequency excitations permits a power reduction of the driving forces necessary to induce detectable motion in magnetic vortex structures. Here we present an experimental and numerical study of patterned tri-layered disk stacks which are composed of 25nm Permalloy|1nm Copper|15nm Permalloy, excited at resonance, ranging from 250-500nm in radii. In-situ Lorentz microscopy was used to acquire time averaged real space images of the vortices' gyrotropic motion and micromagnetic simulations were implemented to further understand the coupled dynamics between the ferromagnetic layers across the thin non-magnetic spacer layer. We discuss the effects of interlayer coupling on the vortex trajectories and resonant frequencies for the individual ferromagnetic layers.

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