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Spin dynamics of a magnetic anti-vortex HAO WANG, C.E. CAMPBELL, University of Minnesota — We report the study of the spin dynamics of a magnetic anti-vortex in a submicron, asteroid shaped permalloy particle using micromagnetic simulations. A gyrotropic mode was found when a shifted anti-vortex core spirals back to the center of the asteroid. Azimuthal spin wave modes with in-plane wave vectors around the center have been excited using an in-plane pulsed field. The simultaneously excited gyrotropic mode causes a splitting of degenerate azimuthal modes. Radial spin wave modes with in-plane wave vectors along radial directions of the asteroid were excited by an out-of-plane pulsed field, which is created by a current surrounding the asteroid. The size dependence of dynamic modes has been systematically studied. The frequency of the gyrotropic mode increases with the thickness of the asteroid, but decreases with its size. The frequencies of both azimuthal and radial spin wave modes decrease with the thickness of the asteroid, and also decrease with the size of the asteroid, as may be expected by simple physical arguments.

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