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Dipolar effect in the standing spin waves of dot structures[1] C. YU, M. PECHAN, Department of Physics, Miami University of Ohio — Standing spin waves in dot structures are generally described by dipole-exchange mechanisms. In this work, the role of dipolar coupling has been probed via micromagnetic simulation of spin wave mode structure on a circular, permalloy, dot (200nm diameter, 40nm thickness) containing a concentric gap (ring) void of magnetic material. This gap precludes exchange coupling between the inner dot and the outer ring of the overall dot structure, while allowing dipolar coupling. The mode structure in the dot is investigated as a function of gap width and diameter with the magnetization perpendicular to the dot disk. Spin wave modes (Magnetostatic forward volume mode) up to 4^{th} order were observed for both continuous dot and dot with a narrow gap (width <10 nm). As the diameter of this narrow gap increases, the spin wave patterns remain intact, though higher order peaks are more affected. When ring width is > 10nm, the spin wave spectra are significantly disturbed, leading to a complete disappearance of high order spin wave modes at gap widths in excess of 16nm. Influence of gap geometry on specific standing wave modes will be presented and discussed.

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C. Yu
Department of Physics, Miami University of Ohio

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