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Surface Induced Suppression of Magnetization and Surface magnetization Reversal in Magnetic Nanoparticles[1] CHAEHYUN KIM, University at Buffalo, WEI LAI, Hunter College, CUNY, RENAT SABIRIANOV, University of Nebraska-Omaha, YUHANG REN, Hunter College, CUNY, HAO ZENG, University at Buffalo, SUNY, Buffalo, NY 14260 — Ferrite nanoparticles show strong size and surface dependent magnetic properties. These manifest themselves as a reduced magnetization with decreasing size and an unconventional temperature dependence of magnetization. These effects can be attributed to competing exchange interactions that contribute differently at the nanoparticle surface and interior, leading to reduced ferromagnetic order at the surface. A simple model is constructed that are consistent with experimental observations and further predict an independent magnetization reversal mode for surface spins. This prediction is verified by magnetic second harmonic generation measurements.

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