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Characterization of Epsilon-Co Nanoparticles with Thin Oxide Shells KATHRYN KRYCKA, State Univ. of New York, Stony Brook 11794, CHI-CHANG KAO, National Synchrotron Light Source, BNL, New York 11973, SARA MAJETICH, MADHUR SACHAN, Dept.of Physics, Carnegie Mellon University, Pittsburgh, Pennsylvania 15213 — In order to fully understand the magnetism of nanosystems it is often necessary to characterize an unavoidable thin magnetic metal-oxide shell. This is particularly challenging when the system is comprised of self-assembled nanoparticles that can neither be treated as fully ordered nor randomly distributed, as was the case for our sample which coherently close packs in regions on the micron scale. X-ray powder diffraction was used to determine that the phase of the shell was cobalt monoxide while the core remained epsilon-Co. TEM showed that the particles were spherical with an average diameter of 7 nm [1], and using small angle x-ray diffraction the nearest neighbor distance was placed at 10.3 nm. Anomalous small angle scattering taken at several energies about the Co k-edge was used to separate the contributions of the metallic cores, metal-oxide shells, and nanoparticle packing. From this experiment radial sizes were determined for both core and shell, the details of which will be presented. 1. "Interaction effects within Langmuir Layers and three-dimensional arrays of epsilon-Co Nanoparticles" (in press to J. Appl. Phys.)

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