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Magneto optical Kerr effect study of close packed arrays of cobalt nanostructure JIYEONG GU, KEVIN NGO, California State University Long Beach, Long Beach, CA 90840 — Nanopatterned cobalt thin films were fabricated on silicon substrate using nanosphere lithography. Nanospheres of different diameters, 200 nm, 600 nm, and 900 nm, were used to pattern the surface of the cobalt thin films. The surface morphology of thin films were characterized using high powered optical microscope, scanning electron microscope and the atomic force microscope. The nanopatterned thin film is highly uniform at macroscopic scale while several distinct nanostructure morphologies are observed at microscopic scale. Magnetic switching behavior was investigated by the magneto optical Kerr effect (MOKE) measurement. Modification to the surface of cobalt thin film was found to extensively change its magnetization behavior due to influence of the shape anisotropy and magnetic domain wall. Coercivity increased in nanopatterned cobalt thin film as compared to the continuous thin film. Nanostructure sample using nanospheres template less than 600 nm was additionally found to show a various features in the MOKE hysteresis loops including the multi-steps, multi-loops and shearing features. The multi-steps and multi-loops behaviors are more prominent as the size of nanosphere is reduced.

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