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Studies on the magnetic reversal properties of cobalt anti-dot micropatterned arrays N. G. DESHPANDE, M. S. SEO, X. R. JIN, S. J. LEE, Y. P. LEE, Hanyang University, Korea, J. Y. RHEE, Sungkyunkwan University, Korea, K. W. KIM, Sunmoon University, Korea — Large-area micropatterned arrays of cobalt anti-dots with different lattice symmetries (square and rhomboid geometry) and periodicities were fabricated by using the CMOS process. The surface morphology as well as the surface topography was checked by scanning electron microscopy and atomic force microscopy, and the magnetic properties were studied by MOKE and magnetic force microscopy (MFM). A systematic study on the magnetic-reversal mechanism, the in-plane anisotropy and the switching-field properties were carried out, together with the OOMMF simulations. It was found from the MOKE measurements that different lattice geometries induce different anisotropies with changes in the easy and the hard axes. In addition, the inclusion of non-magnetic holes in the uniform magnetic film, with modified lattice geometry and periodicity not only changes the domain configuration but also drastically affects the switching field. The MFM images in the remanent state show well-defined domain structures which are periodic in nature according to the lattice geometry. The observed change in the magnetic properties is closely related to the fact that the inclusion of non-magnetic vacancies hinders the domain wall motion, and to the geometrical variation giving rise to different anisotropy.

Kiwon Kim
Sunmoon University

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