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Diffraction MOKE on multilayer magnetic nanodisks KRISTEN BUCHANAN, Argonne National Laboratory, MARCOS GRIMSDITCH, Argonne National Laboratory, KONSTANTIN GUSLIENKO, Argonne National Laboratory, SAMUEL BADER, Argonne National Laboratory, VALENTYN NOVOSAD, Argonne National Laboratory — Diffraction magneto-optical Kerr effect magnetometry (DMOKE) is an excellent tool for investigating magnetization reversal in complex systems as it provides additional information not contained in bulk hysteresis measurements. The hysteresis loops measured on the diffraction beams can be understood in terms of field dependent magnetic form factors. Here the DMOKE technique was employed to investigate the magnetization reversal process in stacked ferromagnetic nano-disks, separated by a non-magnetic layer. The disks interact strongly via magnetostatic interactions and also via interlayer exchange coupling governed by the thickness and composition of the spacer layer. Micromagnetic simulations indicate that the disks will each support vortices of opposite chirality at remanence and reverse through coordinated nucleation, displacement, and annihilation of vortices when interlayer exchange is important. For thin, well separated disks, however, the magnetostatic interactions can be comparable to the vortex nucleation field and the reversal is quite different. Diffraction hysteresis loops for Permalloy (Ni_{80} Fe_{20}) dots with thicknesses of up to 40 nm and radii of 250-1250 nm separated by a Cu spacer (1-20 nm) will be compared with loops calculated from micromagnetic simulations.

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