

Abstract Submitted
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Polarization dependent soft x-ray spectro-microscopy of local spin structures¹ MACCALLUM ROBERTSON, Center for X-Ray Optics,LBNL, CHRISTOPHER AGOSTINO , National Center for Electron Microscopy, LBNL, MI-YOUNG IM, Center for X-Ray Optics,LBNL, SERGIO MONTOYA , ERIC FULLERTON , Center for Magnetic Recording Research, UCSD, PETER FISCHER, Materials Sciences Division,LBNL — Quantitative information about element-specific contributions to local magnetic spin and orbital moments is readily available by XMCD spectroscopy and images of magnetic domain patterns with a few tens of nanometer spatial resolution. We show that the x-ray spectroscopic analysis of x-ray microscopy images provides quantitative information about local spin structures. We have investigated two prototypical multilayered PMA film systems prepared by sputtering, specifically (Co 0.3 nm/Pt 0.5 nm)x30 and (Fe 0.7nm/Gd 0.4nm)x100 systems. A spectroscopic sequence of full-field magnetic transmission soft x-ray microscopy (MTXM) images covering about 8mm field-of-views with a spatial resolution of about 20nm were recorded across the Co and Fe L edges, resp. To modulate the magnetic contrast, two sets of images were obtained with left and right circular polarization. Standard XMCD spectroscopy analysis procedures were applied to retrieve the local spectroscopic behavior. We observe a decrease of the L3/L2 ratio when approaching the domain walls, indicating a non-uniform spin configuration along the vertical profile of a domain, which we will discuss in view of both systems' magnetic anisotropies.

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