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Characterization and Modeling of Off-Specular Neutron Scattering for Analysis of Two Dimensional Ordered Structures CHRISTOPHER J. METTING, ROBERT M. BRIBER, University of Maryland, JULIE A. BORCHERS, BRIAN MARANVILLE, PAUL KIENZLE, CHUCK F. MAJKRZAK, JOSEPH A. DURA, NCNR — Work is currently being done to expand further neutron reflectometry to the off-specular regime for the characterization of thin films with two-dimensional, ordered in-plane structures. The combination of this two-dimensional, in-plane information with the depth-profile that is routinely obtained from reflectivity data can produce a complete, 3-D description of both the structure and magnetic characteristics of these films. The University of Maryland along with the NIST Center for Neutron Research (NCNR) are developing software which can easily be integrated into existing neutron modeling package such as Refpak, and will expand the accessibility of off-specular neutron reflectometry to the general scientific community. In this presentation, we show data obtained using a position sensitive detector on the AND/R instrument at the NCNR facility for a range of model systems. Preliminary analysis has been completed on several sample sets with wire and diffraction grating geometries. In addition, patterned gold samples are being lithographically produced in order to test models for a variety of standard feature structures and patterns.

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