Characterization and Modeling of Off-Specular Neutron Scat-
tering for Analysis of Two Dimensional Ordered Structures
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JOSEPH A. DURA, NCNR — Work is currently being done to expand further neu-
tron 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 struc-
ture 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 Reflipak,
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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