

Resonant Magnetic X-ray and Neutron Scattering
from Rough Interfaces

S.K.Sinha⁽¹⁾, S.A. Stepanov⁽²⁾ and R.M. Osgood⁽³⁾

ABSTRACT

It has become apparent that magnetic roughness at interfaces plays an important role in, for instance, the magnetic and transport behavior of thin film magnetic devices. Reflectivity and diffuse scattering studies of thin films using neutrons or X-rays can be used to distinguish between chemical and magnetic roughness at interfaces and to determine the parameters characterizing the latter, such as the correlation length. We discuss the theory of magnetic scattering of neutrons and resonant X-rays by rough interfaces within the Born and Distorted Wave Born Approximations and illustrate how it has been used to analyze experimental results attained on several systems so far.

(1) Advanced Photon Source, Argonne National Laboratory, Argonne, IL

(2) Illinois Institute of Technology, Chicago, IL and
BioCAT at Advanced Photon Source, Argonne National Laboratory, Argonne, IL

(3) Materials Science Division, Argonne National Laboratory, Argonne, IL
Present Address: 3-M Corporation, St. Paul, MN