Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Recent developments on polarized neutron scattering at NIST WANGCHUN CHEN, NIST, Gaithersburg, Maryland and Indiana University, Bloomington, Indiana, JULIE BORCHERS, ROSS ERWIN, JAMES MCIVER, THOMAS GENTILE, JEFFREY LYNN, NIST, Gaithersburg, Maryland, GORDON JONES, Hamilton College, Clinton, New York — ^{3}He neutron spin filters (NSF) employ nuclear spin-polarized ^{3}He gas, produced by optical pumping, and can be used to polarize or analyze neutron beams because of the strong spin dependence of the absorption cross section for neutrons by ^{3}He. At the NIST center for Neutron Research, the polarized ^{3}He NSF program has been developed to enhance the measurement capability in polarized neutron scattering. This technique has been applied in a number of neutron scattering instruments for user experiments and instrumentation development. Here we will discuss applications of the ^{3}He NSF devices in polarized small-angle neutron scattering (SANS), polarized neutron reflectometry (PNR), and polarized triple-axis spectrometry (TAS). For these applications, we employ ^{3}He NSFs as both neutron polarizers and neutron flippers that are achieved using the adiabatic fast passage nuclear magnetic resonance technique. We will present the results in each of these applications from magnetic nanoparticles on SANS, patterned magnetic thin films on PNR, and the multiferroelectric system on TAS.

Wangchun Chen
NIST, Gaithersburg, Maryland and Indiana University, Bloomington, Indiana

Date submitted: 03 Dec 2007 Electronic form version 1.4