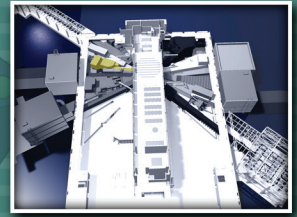


INSTRUMENT

BEAM LINE

4A

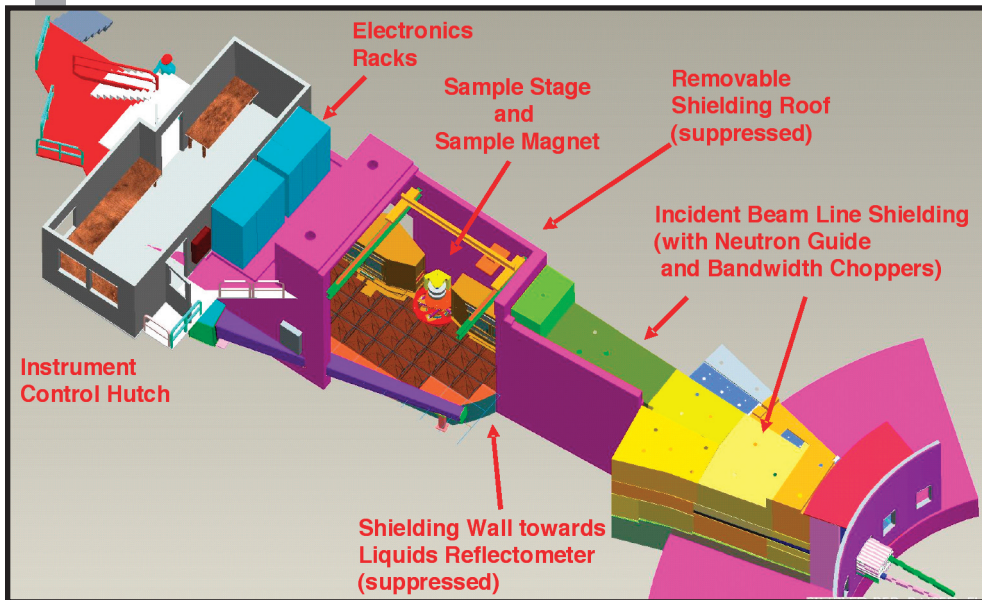
Fact Sheet



MAGNETISM REFLECTOMETER

The magnetism reflectometer is designed for reflectometry and high-angle diffraction studies of magnetic thin films, superlattices, and surfaces. The combination of the high-power SNS neutron source and the use of advanced neutron optics will also allow off-specular diffraction studies of in-plane structures. Today, even at the world's most advanced neutron sources, such experiments are extremely difficult to perform. The availability of polarized neutrons and polarization analysis suggests that the instrument will also be used for specific studies of nonmagnetic thin-film samples. Examples for the latter case include contrast variation, incoherent background reduction, and phase

determination for direct inversion of reflectivity data into real-space scattering-length density profiles.



SPECIFICATIONS

Source-sample distance	18.64 m
Sample-detector distance	0.5 – 2 m
Detector size	20 • 20 cm ²
Detector resolution	1.5 mm
Moderator	coupled supercritical hydrogen
Bandwidth	$\Delta\lambda = 3.1 \text{ \AA}$
Wavelength range	$1.8 \text{ \AA} < \lambda < 14.0 \text{ \AA}$
Q range	$0 \text{ \AA}^{-1} < Q < 7.0 \text{ \AA}^{-1}$
Minimum reflectivity	$10^{-9} - 10^{-10}$

RECENT SIGNIFICANT EVENTS

Instrument Construction

- All poured-in-place shielding has been installed, and the concrete shielding cave has been completed.
- The sample stage has been installed in an SNS lab.

Instrument Science

- Outfitting of a lab for neutron polarization equipment is under way.
- A workshop on high-magnetic field science was held at the National High Magnetic Field Laboratory.

FOR MORE INFORMATION, CONTACT MAGNETISM REFLECTOMETER STAFF

Instrument Scientist: Frank Klose, klosefr@sns.gov, (865) 576-5389

Lead Engineer: Tim Chae, chaet@sns.gov, (865) 241-6740

Electrical Engineer: Andre Parizzi, parizziad@sns.gov, (865) 576-6219

Scientific Associate: Richard J. Goyette Jr., goyetterj@sns.gov, (865) 241-9991

www.sns.gov/users/instrument_systems/instruments/elastic/magnet.shtml

