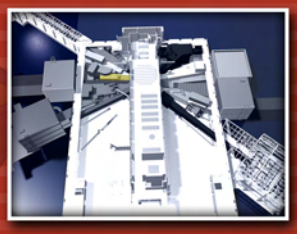
Instrument Fact Sheet

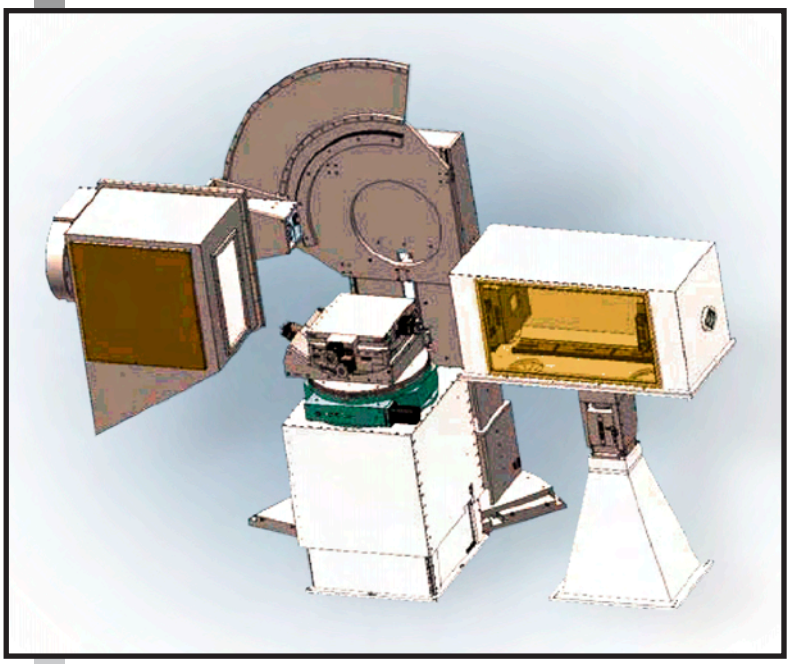
BEAM LINE 4B

Spallation Neutron Source



Liquids Reflectometer

The Liquids Reflectometer features a horizontal sample geometry and thus can accommodate air/liquid surfaces in addition to air/solid and liquid/solid interfaces. Active vibration isolation minimizes capillary-wave production by the external environment. Data rates and Q range covered at a single scattering angle setting will be sufficiently high to permit "real-time" kinetic studies on many systems. Time-resolved experiments include investigations of chemical kinetics, solid-state reactions, phase transitions, and chemical reactions in general.



Liquids Reflectometer goniostat.

Specifications

Source-to-sample distance	13.6 m
Sample-to-detector distance	1.5 m
Detector size	20 x 20 cm^2
Detector resolution	1.3 x 1.3 mm^2
Moderator	Coupled supercritical hydrogen
Bandwidth	$\Delta\lambda$ = 3.5 Å
Wavelength range	2.5 Å < λ < 17.5 Å
Q range (air/liquid)	0 $Å^{-1}$ < Q < 0.5 $Å^{-1}$
Q range (air/solid)	0 $Å^{-1}$ < Q < 1.5 $Å^{-1}$
Minimum reflectivity	1 x 10^{-7}

Status: Operational

Applications

The Liquids Reflectometer is useful for a wide range of science. Current areas of interest include biomaterials, polymers, and chemistry involving thin layers of surfactants or other materials on the surfaces of liquids, such as cell-membrane analogs. These systems provide a flexible platform to study structure-property relationships at the boundary between hard and soft matter, with applications in biomimetics, bio-sensing, and bio-compatible films; hydrogen storage and fuel cells; and polymers.

For more information, contact

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http://neutrons.ornl.gov/instrument_systems/beamline_04b_lr

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