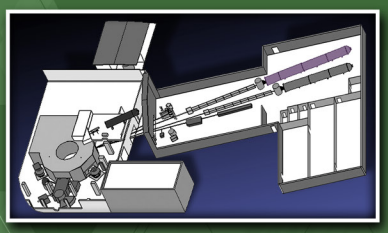
High Flux Isotope Reactor

Instrument

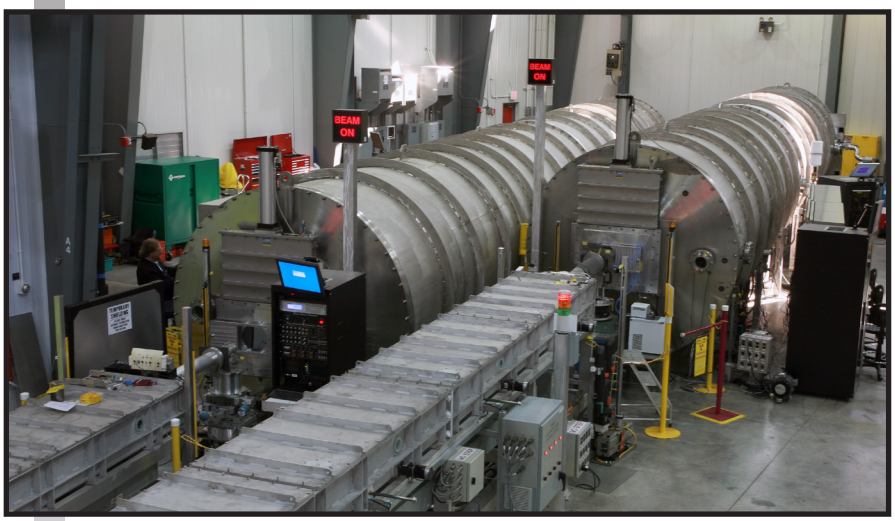
BEAM LINE

CG-2



General-Purpose SANS – Small-Angle Neutron Scattering Diffractometer

The general-purpose SANS diffractometer is optimized for providing information about structure and interactions in materials in the size range of 0.5–200 nm. It has a cold neutron flux on sample and capabilities comparable to those of the best SANS instruments worldwide, including a wide range of neutron wavelengths $\lambda = 4–20$ Å, resolution $\delta\lambda/\lambda = 9–45\%$, and a 1 m^2 area detector with 5 × 5 mm^2 pixel resolution with a maximum counting capability of up to 2 MHz. The sample-to-detector distance can be varied from 1 to 19.5 m, and the detector can be offset horizontally by up to 45 cm, allowing a total accessible Q range of from <0.001 to 1 $Å^{-1}$. The 2 m sample environment area accommodates large, special-purpose sample environments such as cryomagnets, furnaces, mechanical load frames, and shear cells.



Specifications

Beam spectrum	$\lambda = 4–25$ Å $\Delta\lambda/\lambda = 9–45\%$
Sample-detector distance	1–20 m
Detector offset	0–45 cm
Source-sample distance	1.8–17.4 m
Max flux on sample	$>2 \times 10^7$ n/cm^2/s at $\lambda = 4.75$ Å, $\Delta\lambda/\lambda = 14\%$
Detector	2-dimensional linear position-sensitive detector
Detector resolution/ pixels	192 x 256
Momentum transfer range	Q = 0.0007 –1 $Å^{-1}$ Q_{max}/Q_{min} 10–20

Status: Available to users

Applications

- Soft condensed matter: molecular self-assembly and interactions in complex fluids; intermediate order in glassy systems, polymer solutions, gels and blends, colloids, micelles, and microemulsions
- Hard condensed matter: phase separation, grain growth, and orientation in metallurgical alloys; structures of nanocomposites, advanced ceramics, and porous catalytic; gas storage in adsorbents including man-made and natural materials
- Magnetic systems: flux lattices in superconductors, ferrofluids, and the relationship between structural and magnetic domains and ordering

For more information, contact

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May 2018

18-G00153/gim