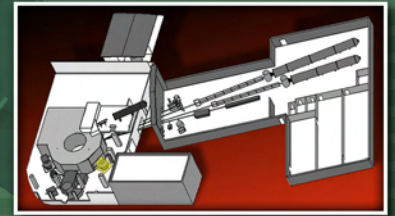


INSTRUMENT

HB-1

BEAM LINE HIGH FLUX ISOTOPE REACTOR

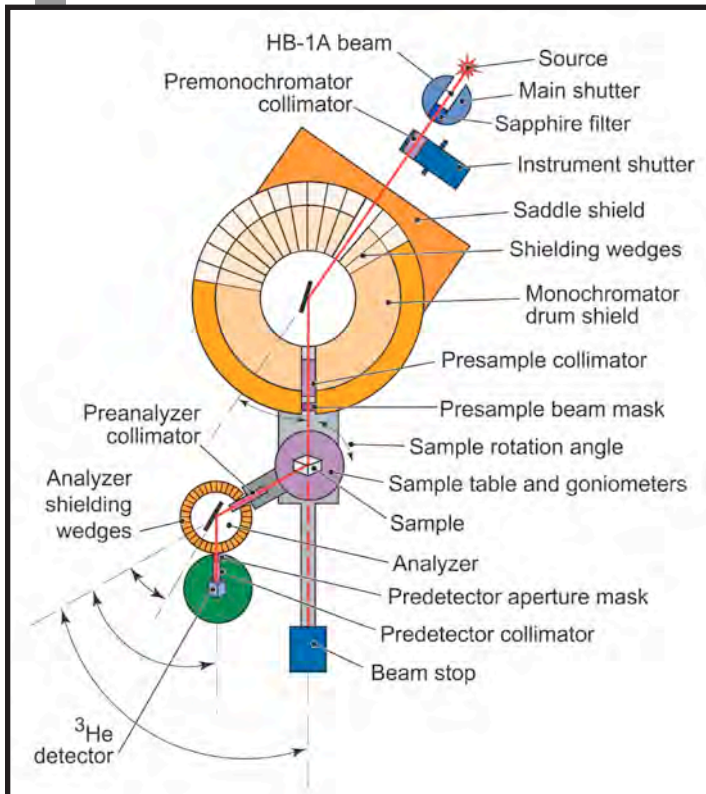
Fact Sheet



TRIPLE-AXIS SPECTROMETER

The HB-1 Triple-Axis Spectrometer is designed primarily for the study of excitations in crystalline solids at intermediate energies. Thanks to the vertical beam focusing and the very high time-averaged flux at HFIR, its geometry is optimal for investigating small

samples and weak scattering in specific areas of energy-momentum space. The sample goniometers and a full software implementation of the three-dimensional sample orientation matrix allow measurements outside the traditional single-scattering plane. The unique capability of HB-1 is the polarized configuration for studies of excitations, phase transitions, structures, and density distributions in magnetic materials.



APPLICATIONS

The following are some of the scientific applications for which the Triple-Axis Spectrometer is particularly well suited.

- Spin waves in ordered magnetic materials
- Exotic excitations in low-dimensional, molecular, itinerate, and other “quantum” magnets
- Spin and lattice excitations in high- T_c superconductivity, colossal magnetoresistance materials, and multiferroic systems
- Spin density distributions in magnetic compounds
- Phonon dispersion curves in alloys and phonon-driven phase transitions

SPECIFICATIONS

Beam spectrum	Thermal
Monochromators	Unpolarized PG(002) Polarized (not currently available)
Analyzers	Unpolarized PG(002), Be(101), Be(002) horizontally focused PG(002) Polarized (not currently available)
Monochromator angle	18 to 75°
Sample angles	0 to 360°
Scattering angle	-90 to 140°
Analyzer angles	-40 to 140°
Collimations (FWHM)	C1: 0.25, 0.5, 0.8° C2: 0.166, 0.333, 0.666, 1, 1.333° C3: 0.166, 0.333, 0.666, 1, 1.333° C4: 0.333, 0.666, 1, 2°

Status: Operational

FOR MORE INFORMATION, CONTACT

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http://neutrons.ornl.gov/hfir_instrument_systems/HB-1.shtml



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