

Beamline 11-ID / BESSRC-CAT

Scientific focus: Spectroscopy, scattering, high-energy diffraction, and magnetic Compton scattering

Scientific programs: Materials science (x-ray scattering, high-energy diffraction, dichroism, magnetism), geoscience, atomic physics, and chemistry (spectroscopy [EXAFS, XANES], time-dependent spectroscopy of excited states)

Optics & Optical Performance

11-ID-D

- modified standard BESSRC monochromator
- 4.0–50 keV energy range Si(220)
- 20 mm fixed offset
- cryo-cooled 1st and 2nd crystals
- mirrors
 - Pt and Pd coatings
 - 2.8 mrad incident angle/Pt mirror
 - 4.0 mrad incident angle/Pd mirror

11-ID-B & -C

- Bragg or Laue horiz. deflecting monochromators
- 40–200 keV energy range
- Si(311) or Si(220) crystal
- water/Ga cooling

Experiment Stations

11-ID-A

- white beam first optics enclosure
- double-crystal monochromator (for 11-ID-D)
- double (side-by-side) mirror system (for 11-ID-D)
- side-deflecting monochromators (for B & C stations)

11-ID-B

- magnetic Compton scattering

11-ID-C

- high-energy diffractometer

11-ID-D

- spectroscopy (EXAFS, XANES, dichroism)
- x-ray scattering

Detectors

- ionization chambers
- Bicron
- solid-state detectors (Si and Ge)
- Canberra 9-element Ge

Beamline Controls and Data Acquisition

11-ID-B & -C

- MacOS-EPICS

11-ID-D

- Linux-EPICS
- SPEC
- MacOS
- Windows EPICS

Beamline Support Equipment/Facilities

11-ID-C

- high-energy diffractometer (vertical, post mono)
- diffractometer
- analyzer
- detector

11-ID-D

- spectroscopy table
- 8-circle Huber ψ goniometer

Insertion Device Source Characteristics (nominal)

source	elliptical multipole wiggler
period	16.0 cm
length	2.8 m
number of poles	36, electromagnets 34, permanent magnets
effective K_x (at max. current = 1.15 kA, B_{max} = 0.087 Tesla)	1.3
peak K_y (at minimum gap = 24.0 mm)	14.4
switching frequency	0 - 10 Hz
critical energy (at minimum gap = 24.0 mm)	34 keV
energy range	4.0 - 200.0 keV
source size at critical energy Σ_x Σ_y	359 μ m 21 μ m
source divergence at critical energy Σ_x (FWHM 1.9 mrad, non-Gaussian) Σ_y	820 μ rads 47 μ rads