

Beamline 9-ID / CMC-CAT

Scientific focus: Materials science

Scientific programs: SAXS from complex materials, liquid/solid surface scattering, EXAFS, general diffraction, and magnetic scattering

Optics & Optical Performance

Primary branch optics and optical performance

- white-beam slit
 - 4.5 mm x 4.5 mm input aperture
 - 2.1 mm x 2.1 mm max. output aperture
 - ctr. of output aperture adjustable w/ input aperture
- double-crystal Si(111) monochromator
 - 30.5 m from source
 - 3.1–22.5 keV energy range
 - 25.0 mm beam offset
 - 10^{-4} energy resolution ($\Delta E/E$) at 10 keV
 - cryogenic cooling
- vertical-focusing mirror
 - 34.4 m from source
 - flat figure with bender
 - 600 mm x 120 mm
 - Au, Ni, Rh coatings
 - 0–4 mrad incident angle
- horizontal-focusing mirror
 - 33.2 m from source
 - flat figure with bender
 - 900 mm x 120 mm
 - Au, Ni, Rh coatings
 - 0–4 mrad incident angle

Secondary branch optics and optical performance

- side-station monochromator
 - 28 m from source
 - horizontal double crystal
 - 5–9.5 keV energy range
 - water-cooled diamond crystal
 - 1000 mm horizontal beam offset
 - 10^{-4} energy resolution
- vertical-focusing mirror
- horizontal-focusing mirror

Experiment Stations

9-ID-A

- white beam first optics enclosure

9-ID-B & -C

- monochromatic beam station
- general diffraction
- SAXS
- EXAFS
- liquids

Detectors

- Smart 1500 CCD
- BNL 2D WIRE
- BNL 1D WIRE

Beamline Controls and Data Acquisition

- Sun UNIX running EPICS w/ VME, SPEC, etc.

Beamline Support Equipment/Facilities

- 6-circle diffractometer
- SAXS set up
- Bonse-Hart camera
- liquid surface reflectometer
- UHV surface apparatus

Insertion Device Source Characteristics (nominal)

source	Undulator A
period	3.30 cm
length	2.47 m
effective K_{\max} (at minimum gap = 10.5 mm)	2.78
energy range 1st harmonic	4.0 - 13.0 keV
energy range 1st - 5th harmonics	4.0 - 45.0 keV
on-axis peak brilliance at 6.5 keV	9.6×10^{18} ph/sec/mrad ² /mm ² /0.1% bw
source size at 8.0 keV \sum_x \sum_y	359 μ m 21 μ m
source divergence at 8.0 keV $\sum_{x'}$ $\sum_{y'}$	24 μ rad 6.9 μ rad