

Beamline 8-ID / IMMW-CAT

Scientific focus: Condensed matter physics and materials science

Scientific programs: Intensity fluctuation spectroscopy studies using coherent x-rays, time-resolved x-ray scattering, x-ray scattering studies and very low temperatures, and x-ray magnetic scattering

Optics & Optical Performance

- horizontally deflecting mirror
 - 29.2 m from source
 - 7.6–30 keV energy range
 - water cooling
- transmission diamond monochromator
 - 51.6 m from source
 - 7.6–30 keV energy range
 - $\Delta E/E=44 \times 10^{-6}$ energy resolution at 8 keV
 - symmetric Bragg diamond (111)
 - water cooling
 - 10^{12} ph/sec flux
- double-crystal silicon monochromator
 - 65 m from source
 - 7.6–9.6 keV energy range
 - 20 x 20 μm to 1 x 1 mm spot size
 - $\sim 10^9$ ph/sec in 20 x 20 μm
- zone plate optics focused beam to 2 μm

Experiment Stations

8-ID-A

- white beam first optics enclosure

8-ID-D

- pink beam monochromator enclosure

8-ID-E

- monochromatic beam experimental station

8-ID-I

- pink and monochromatic beam experimental end station

Detectors

- two PI direct detection CCD detectors
- PI optically coupled CCD detector
- photodiode array linear detector
- Amptek CZT and Si detectors

Beamline Controls and Data Acquisition

- Linux-based control system
- SPEC x-ray control software

Beamline Support Equipment/Facilities

- coherent small-angle/ultra-small angle scattering spectrometer ($Q_{\min} \sim 0.0005 \text{ \AA}^{-1}$)
- time-resolved diffractometer
- He-3 cryostat on horizontally scattering 4-circle diffractometer
- Displex cryostat

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	2.9 - 13.0 keV
energy range 1st - 5th harmonics	2.9 - 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 μm 21 μm
source divergence at 8.0 keV $\sum_{x'}$ $\sum_{y'}$	24 μrad 6.9 μrad