

BL44B2 RIKEN Structural Biology II

This beamline is dedicated to macromolecular crystallography in white (Laue) and monochromatic X-ray mode. White X-rays from the standard "B2" type bending magnet are focused with a 1-m-long platinum-coated bent-cylinder mirror (white X-ray mode), or monochromatized with a fix-exit double crystal monochromator (DCM) then focused with the same mirror (monochromatic X-ray mode). The first crystal of the DCM is moved in or out depending on the experimental mode. The glancing angle ($2 \sim 5$ mrad), the radius of curvature (3000 $\sim$ 7000 m), and the vertical position (± 15 mm) of the mirror are adjusted for the optimum focusing at the sample position (see the optical layout). The photon flux at the sample position ($1 \times 1 \text{ mm}^2$) is estimated to be 10^{15} photons/sec (7 $\sim$ 30 keV, white mode), and 10^{11} photons/sec (@ 20 keV, monochromatic mode).

Area of research

Laue macromolecular crystallography

Keywords

Scientific field

Laue macromolecular crystallography with white X-rays

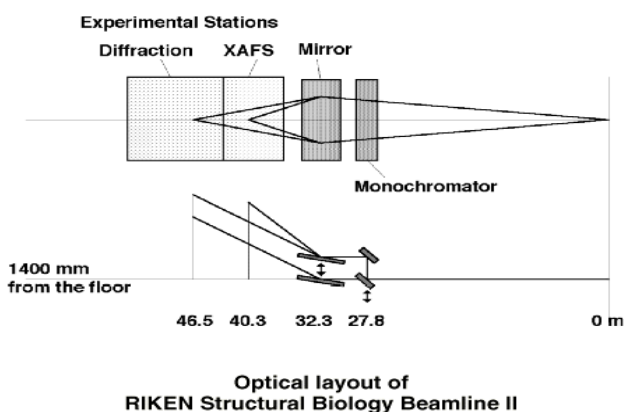
Equipment

CCD detector

Source and optics

X-rays at sample

Energy range	6 $\sim$ 30 keV
Energy resolution	$\Delta E/E \sim 10^{-4}$
Photon flux	10^{11} ph/s (@ 20 keV)(Monochromatic) 10^{15} ph/s (7 $\sim$ 30 keV) (white)



Experimental stations

The second experimental hutch (3 m (W) $\times$ 6.5 m (L) $\times$ 3.3 m (H)) is used for white X-ray diffraction experiment. The white X-ray mode is suitable for time-resolved Laue crystallography, and a typical exposure time using an Imaging Plate detector is likely to be ~ 100 microseconds. The energy resolution ($\Delta E/E$) is in the order of 10^{-4} . The fluorescence and transmission mode are feasible in the energy range of 6 $\sim$ 30 keV.

Diffraction station

Measurement

- On-line CCD detector : detector area ϕ 165 mm
- Scintillation counter for the measurement of absorption edge
- High speed X-ray shutters

Sample

- Cryostat : temperature control range 20 $\sim$ 375 K

Control

- Workstation for control and data collection

Others

- Digital storage oscilloscope (1 GHz)
- On-line microspectrophotometer

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