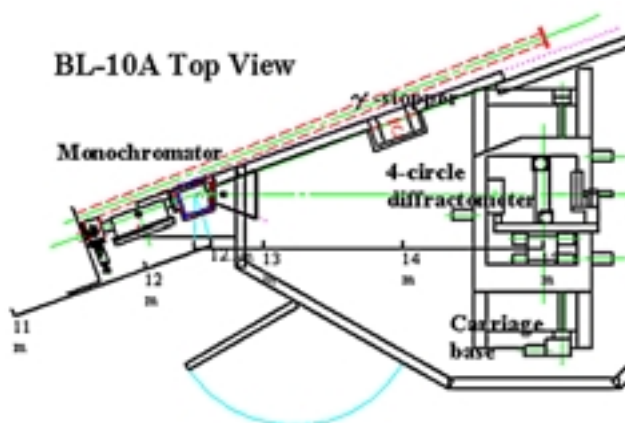


## BL-10A X-ray Diffraction/Scattering, Crystal Structure Analysis Station

This station is mainly used for X-ray single-crystal structure analyses and diffraction experiments with a monochromatized X-ray. The beam line consists of 1) a Pt-coated double flat mirror system located at a distance of 12.0m from the source, 2) a horizontal dispersive type single crystal monochromator located at 12.5m and 3) a vertical type four-circle diffractometer located in the experimental hut. The mirror system is optionally inserted in the beam line to decrease higher harmonics during an experiment using longer wavelength X-rays. A flat crystal, either Si(111), Si(311), Si(533), PG(001) or Qz(100) is currently used as a monochromator and two of them can be simultaneously mounted in the monochromator chamber and selected remotely according to the purpose of experiments. A vertical type 4-circle diffractometer with a large  $\chi$ -circle( 400mm in outer diameter) has been installed in the experimental hut. The sample located at a distance of 15.0m from the source point.



**SCHEMATIC VIEW OF THE BEAMLINE**

### Area of Research

Single crystal structure analysis  
X-ray diffraction / scattering

### Light Source

Bending magnet

### Optics

Pt coated double flat mirrors  
Horizontal dispersive type single crystal monochromator  
[monochromator crystals: Si(111), Si(311), Si(533), PG(001), Qz(100)]

### Photons at Sample

Energy range : 5 - 25 keV  
Energy resolution:  $10^{-3} \sim 5 \times 10^{-4}$   
Photon Flux:  $10^9$  photons/mm<sup>2</sup>/sec  
without mirrors, Si(111), 2.5GeV, 100mA  
Beam size: 0.05mm ~ 1mm $\phi$ (slit size)

### Facilities in Experimental Station

Vertical type 4-circle diffractometer:

Angle range[degree]:

$2\theta$ -115 ~ 150 ,  $\omega$ -50 ~ 65,  $\chi$ ,  $\phi$  free rotation

Angle accuracy[degree]:  $2\theta$ ,  $\omega$  0.005,  $\chi$ ,  $\phi$  0.01

Data collection speed under Typical Condition:

~ 400 reflections / day

Personal computer for beam line optics and 4-circle diffractometer control [NEC PC-9801VM2(MS-DOS)with 5.3.5" FDD(2HD)]

Software for 1) beam line optics semi-automatic adjustment, 2) crystal orientation settlement and refinement, and 3) automatic diffraction intensity data collection [MS-C program on MS-DOS operating system], Additional batch job programs are available.

Oxford Cryostream Cooler N<sub>2</sub> gas flow sample cooling system( 90 - 350 K )

Rigaku Denki N<sub>2</sub> gas flow sample cooling and heating system( 110-500 K )

IP[400mm  $\times$  250mm] holder cassette for camera method

### References

1. Photon Factory Activity Report 1982/83 V-7(1984)
2. M.Tanaka and S.Sasaki, (1993) KEK Internal 93-4

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