

BL-16B Undulator Soft X-ray Station with High-Resolution Spherical Grating Monochromator (H-SGM)

This beamline provides high-flux and highly monochromatic vacuum ultra violet and soft X-ray with the high-resolution spherical grating monochromator (H-SGM). The type of the monochromator is known as the Dragon type. The monochromator have three spherical gratings with SiC, which are used to cover the energy range from 40 to 550 eV. As a benefit of the prominent characteristics of high brilliance of the undulator source ($\lambda_u = 12$ cm, $K = 0.5 \sim 5.75$), high flux beams in a small spot ($< 1\phi$) with a high resolving power are easily obtainable. Users can tune the undulator gap at any time during their experiments. There is another soft X-ray undulator beamline BL-2C, which can obtain higher flux above 280 eV than BL-16B.

Area of Research

Soft X-ray spectroscopy (absorption, emission, photoelectron, etc.) of solids and gases

Light Source

Type: Undulator U#16
 λ_u : 12 cm
Tunable energy range: 40 ~ 550 eV

Optics

First mirror (M0): Cylinder (horizontal focusing)
Pre-focusing mirror (M1): Concave
Spherical gratings: 400 l/mm, 900 l/mm,
and 2000 l/mm with the radius of 23.8 m
Post-focusing mirrors (M2 and M3): Bent cylinder

Photons at sample

$10^{10} \sim 10^{13}$ photons / sec / 300mA (@ width of the exit slit = 100 μ m; $E / \Delta E = 1000-2000$)

Facilities in Experimental Station

- Personal computer for monochromator control [NEC PC-9801 VX with 5" FDD (MS-DOS)]
- Software for monochromator control "PF98" (similar to other VUV stations at PF)
- Photon intensity monitor system (measurement of the current from M3)
- Stage for vacuum chambers (1m \times 1m \times 2 pieces)
- Usual system for pulse counting with ORTEC974
- ADC system (LABO Co. Ltd.)

Remarks

Beam time is shared with another branch BL-16A that provides hard X-ray.

BL-16B does not have any standing vacuum chamber so that users should bring one. There is rather small space to place apparatus at the BL-16B (L4.0m \times W1.2m \times H2.5m). Please contact the spokesperson to confirm

that your apparatus is able to be placed at the station.

Beam level is about 1.37 m above the floor but about 1.2 m above the stage level. The port of the beamline end is ICF114 flange.

BL-16B have neither a thin film filter for users nor a differential pumping system between the monochromator and the beamline end so that users should take steps to prevent the monochromator chamber from contaminating during their experiments.

References

1. E. Shigemasa, Y. Yan, and A. Yagishita, KEK report 95-2 (1995).
2. E. Shigemasa, A. Toyoshima, Y. Yan, T. Hayaishi, K. Soejima, T. Kiyokura, and A. Yagishita, J. Synchrotron Rad. 5, 777 (1998).

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