

# Present Status of VUV / Soft X-ray Undulator Beamline BL-13A in the Photon Factory for Study of Organic Thin Films and Biomolecules Adsorbed on Surfaces

Kazuhiko Mase, Akio Toyoshima, Takashi Kikuchi, Hirokazu Tanaka,  
Kenta Amemiya, and Kenji Ito  
IMMS, KEK

Recently organic thin films and biomolecules adsorbed on surfaces have attracted the interest of many researchers. An understanding of the structure and electronic properties of their surfaces and interfaces is important not only in fundamental science but also in industry, because applications of organic electronics such as electroluminescent devices and biosensors are rapidly growing. To contribute to this field we have constructed a new vacuum ultraviolet / soft X-ray undulator beamline, BL-13A [1] (Fig. 1), and opened it for users from January 29, 2010. An ultrahigh vacuum chamber equipped with an electron energy analyzer (Gamma Data / Scienta, SES200) is used as the main end station (Fig. 2). The main scientific targets are investigations of organic thin films and biomolecules adsorbed on well-defined surfaces using angle-resolved photoelectron spectroscopy (ARPES), high resolution X-ray photoelectron spectroscopy (HR-XPS) and X-ray absorption spectroscopy (XAS). The present measured performance is as follows: photon energy region: 30 – 1,200 eV, photon flux:  $10^9 - 10^{11}$  photons  $s^{-1}$ , photon energy resolution ( $E/\Delta E$ ): 10,000 at photon energy of 401 eV, spot size at the second focus: about 630  $\mu\text{m}$  (horizontal)  $\times$  about 120  $\mu\text{m}$  (vertical), photon energy drift:  $\leq \pm 0.02$  eV at photon energy of 244.39 eV, reduction of photon flux in the C K-edge region: about 50%.

**Reference:** [1] K. Mase, A. Toyoshima, T. Kikuchi, H. Tanaka, K. Amemiya, and K. Ito, AIP conference proceedings, **1234** (2010) 703.

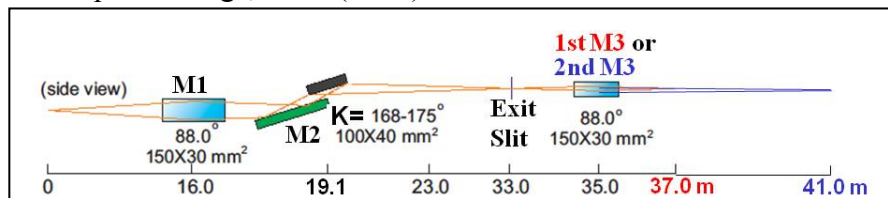


Fig. 1. Optics of BL-13A.

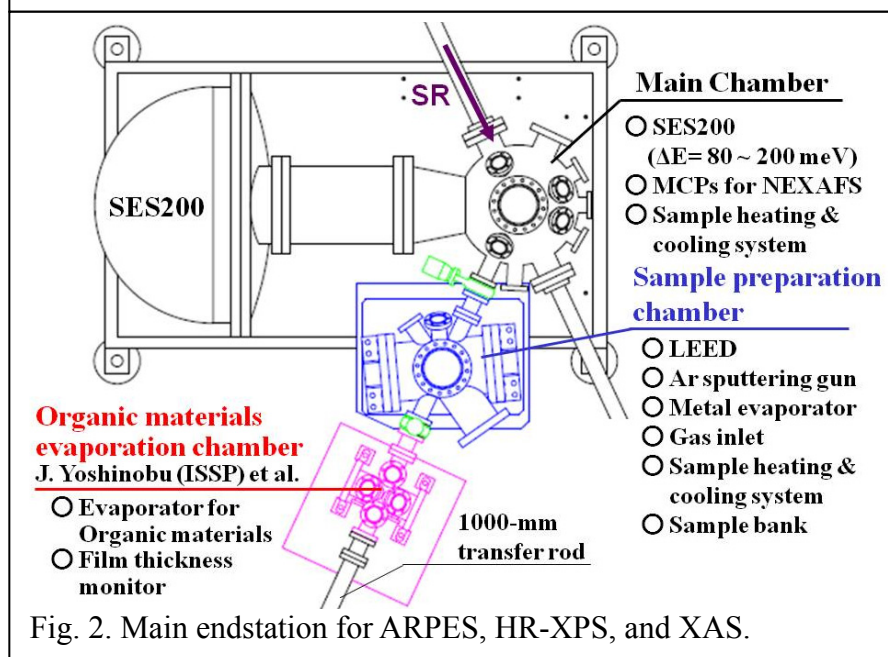


Fig. 2. Main endstation for ARPES, HR-XPS, and XAS.