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BL40B2

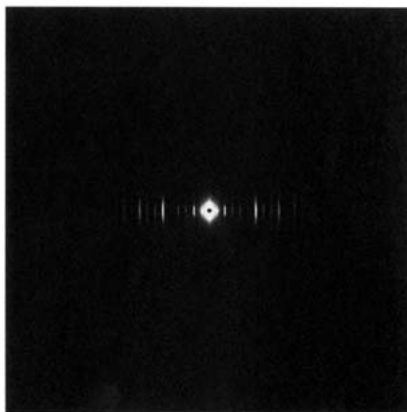
## Commissioning & evaluation of the detector for small-angle x-ray scattering measurement at BL40B2

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BL40B2 is built for small-angle x-ray scattering (SAXS) experiments with non-crystalline biological materials. The light source is a bending magnet and the white x-rays generated by the bending magnet are monochromatized using a double crystal monochromator and focused by a 1-m-long rhodium coated cylinder mirror. The flux, when the ring current was 100 mA, is estimated to be  $1 \times 10^{11}$  photons/sec at  $1 \text{ \AA}$  (Also at the other wavelength, the flux is in same order). In this condition, the energy resolution ( $\delta E/E$ ) is in the order of  $10^{-4}$ . The beam size is  $250 \text{ }\mu\text{m}$  (horizontal)  $\times$   $200 \text{ }\mu\text{m}$  (vertical) (FWHM) at the detector position. The tunable energy range is  $0.7 \text{ \AA} \sim 1.8 \text{ \AA}$ . As a detector, an imaging plate area detector (RIGAKU R-AXIS IV++) is installed. R-AXIS has two image plates, and their size are  $30 \text{ cm} \times 30 \text{ cm}$ . Thus, the advantage of this detector is the wide measure window and the high spatial resolution. However, it takes at least 5 minutes to take one data, because of very low reading speed. Actually, R-AXIS should suit only for static experiments. Recently, among users, the increasing people want to another detector, which has

a high reading speed. So, we decided to install the gas detector that has been developed at Daresbury, UK. This is called RAPID and it has a high count rate and a high quantitative ability. And almost real-time reading is possible. The scattering pattern from chicken collagen, which is recorded with RAPID is shown below. As can be seen in this figure, spatial resolution is quite good. And through the commissioning of RAPID, all the performance was as good as that should be expected.



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BL40B2

## Improvement of the long camera for small angle X-ray scattering measurement at BL40B2(2)

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BL40B2 is built for small-angle x-ray scattering (SAXS) experiments with non-crystalline biological materials. The light source is a bending magnet and the white x-rays generated by the bending magnet are monochromatized using a double crystal monochromator and focused by a 1-m-long rhodium coated cylinder mirror. The flux, when the ring current was 100 mA, is estimated to be  $1 \times 10^{11}$  photons/sec at  $1 \text{ \AA}$  (At the other wavelength, the flux is in same order). In this condition, the energy resolution ( $\delta E/E$ ) is in the order of  $10^{-4}$ . The beam size is  $250 \text{ }\mu\text{m}$  (horizontal)  $\times$   $200 \text{ }\mu\text{m}$  (vertical) (FWHM) at the detector position. The tunable energy range is  $0.7 \text{ \AA} \sim 1.8 \text{ \AA}$ . Four sets of quadrant slit are set in the experimental hutch. For correcting the beam shape and removing the parasitic scattering, one or two sets of slit will be used. Two fixed-length vacuum paths allow camera lengths of 400 mm and 1000 mm. As a detector, an imaging plate area detector (RIGAKU R-AXIS IV++) is installed. This beamline was designed to be suitable for static measurements with high accuracy and high resolution. So far, in order to get the scattering data with high small angle resolution, we tried to improve

the optics set up. As a results, the Be window have been replaced to the kapton rwindow, because that the parasitic scattering must be reduced. With such improvement, 4.5-m-long camera length can be set in the experimental hutch. In the next period, we will commission this optics.