

## Poster Presentation

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### *Upgrade of a high flux MX beamline BL41XU at SPring-8*

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BL41XU is the oldest macromolecular crystallography (MX) beamline at SPring-8 [1]. Although it has been contributing to the structure determination of difficult samples since its start of operation in 1997, the targets for the structural study is still getting more challenging and the crystal quality brought to the beamline is getting worse. Therefore, we have upgraded the focusing optics and diffractometer of BL41XU to cope with these targets. Our goal is to achieve an environment which can offer a stable beam with a photon flux of  $>10^{13}$  photons/s in the beam size range of 5 ~ 50 $\mu$ m. It is a complementary specification with our micro-focus beamline BL32XU [2], and allows both micro-crystallography and data collection using crystal volume. The new optics adopts a two-step focusing with elliptical figured mirrors: the first optics is a single horizontal mirror and the second one adopts Kirkpatrick–Baez (KB) configuration. At the middle of the two focusing optics, a high precision horizontal slit is installed to define secondary source size. The beam size can be changed either by changing the secondary source size, by offsetting the sample position, or by tilting the vertical mirror. For the stable use of small beam, both KB mirror and diffractometer were equipped on the granite stage, and enclosed in a booth in which the temperature is keep stable. On the new diffractometer, we equipped PILATUS3 6M that enables rapid data collection combining with high flux beam. Together with the upgrade of hardware, software tools, which support diffraction based centering and determination of measurement condition, have been implemented in order to make full use of the renewed beamline. The upgrade was conducted in the long shut-down period between January and March of this year, and the beamline was opened for users in the middle of May after commissioning of one month. The result of commissioning and initial results will be presented. This study was supported by the MEXT of Japan.

[1] K. Hasegawa, et al., *J. Synchrotron Rad.*, 2013, 20, 910-913, [2] K. Hirata, et al., *J. Phys.: Conf. Ser.*, 2013, 425, 1-4

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