Automated Operation of Protein Crystallography Beamlines at the SPring-8

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RIKEN Structural Genomics Beamlines (BL26B1&B2) at the SPring-8 have been constructed for high throughput protein crystallography. The beamline operation is automated cooperating with the sample changer robot named SPACE (SPring-8 Precise Automatic Cryo-sample Exchanger) [1].

Since April 2004, BL26B2 has been continuously operated with the sample changer. More than twenty-five crystals a day have been constantly delivered by sample-tray to the beamline. The crystal screening at the beamline can be finished within ten minutes per a sample. For qualified crystals, unattended data collections have been perpetually performed. The sample-tray is portable with a Dewar and experimental conditions are uploaded to the web site, which have been developed considering the mail-in data collection.

The operation software BSS (Beamline Scheduling Software) provides the intuitive GUI and unified control of beamline instruments with the networked client-server architecture. The software structure has flexibility to be implemented at other protein crystallography beamlines. Other than BL26B1 and B2, three other beamlines have already adopted BSS. Further application to other beamlines is progressing to achieve the unified and user-friendly environment among all beamlines at the SPring-8.

[1] Ueno G., Hirose R., Ida K., Kumasaka T., Yamamoto M., *J. Appl. Cryst.,* 2004, **37**, 867-873.
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