**s7.m0.p15 Automatic Weissenberg Data Collection System for Time-Resolved Protein Crystallography.** N. Sakabe[1] , K. Sakabe, T. Higashi[a] , N. Igarashi[b] , M. Suzuk[b], N. Watanabe[c] and K. Sasaki[d], *FAIS,305-0005, Japan, [a]Rigaku corp. 196-8666, Japan. [b]KEK, PF, 305-0801, Japan. [c]Hokkaido Univ., 060-0810,Japan. [d]Nagoya Univ.464-8601, Japan*
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A totally new type of fully automatic Weissenberg data-collection system[1] called "Galaxy" was developed and was installed at BL6C at the PF. This automatic data collection systemconsists of a rotated-inclined focusing monochromator with simultaneous tuning of the asymmetry factor and the radius of curvature with a single rotation of the monochromator crystal about the azimutal axis over a large wavelengh range (0.87-1.90A)[2], a screenless Weissenberg type camera, an image reader, an eraser, a cassette transportation mechanism, a control console and a safety and high speed computer network system linking data processing computers and data servers.

Computers and data servers are located in the TARA house in the distance of 30m from the beamline. The special characteristics of this system are a Weissenberg camera with a pair of movable cylindrical IP cassette whose radius and width are 400mm and 450mm, respectively and very high speed IP reader with five reading heads. The cylindrical IP cassette has 36 small rectangular holes at equal intervals along the circumference of the cylinder. The exposure area on the IP can be selected by two movable screens on the upper and lower sides of the horizontal plane. It is available for two selections of the exposure area called a symmetric and an asymmetric setting against incident beam position. The number of frame per a cassette depends on the resolution limit and wavelength of incident X-rays. The frame exchange time is only a few seconds. The total recording time for a full set of a data is expected for 19min at BL6C at the PF and is expected for only 30sec at BL41XU in the SPring-8. In this condition, this data collection system can be applied to time-resolved protein crystallography at the minutes level time resolution at the PF and at the seconds level time resolution at the SPring-8. The detail explanation of this system will be presented at the meeting. This work was supported by JSPS-RFTF96 R14501.

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[2] Nobuhisa Watanabe et al, J. Synchrotron Rad. 6 (1999) 64-68.
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**s7.m0.p16 A new Pixel Detector for X-ray Diffraction.** J.F. Berar, B. Caillot, C. Mouget, *Lab. Cristallographie, Grenoble*, L. Blanquart, J.C. Clemens, P. Delpierre, *CPPM-IN2P3, Marseille.*
Keywords: instrumentation, detectors.

In a diffraction experiment we measure intensity but we are really interested in structure factors. Thus ithe required dynamic range of the input signal needs to be the square of the range of the structure factor. If we are concerned by complex structures, such as incommensurates, diffuse scattering or reflectivity, the measured signal commonly ranges over more than 6 orders of magnitude. Similar requirements are needed in SAXS experiments.

To meet this requirement and to reduce dead time reading a camera, 2D detectors must be improved. Moreover the pixel size of CCD camera is too small compared to X-ray source sizes resulting in a demagnification in which the statistic properties of the counting can be loss.

Since the nineties, the high energy physics community has developed new detectors using the integrated electronics. Such detectors (DELPHI, ATLAS..) use a hybrid technology. The collecting diode and the dedicated chip are on separated Si-wafers which are bonded together by a small metallic junction. They have now reached pixel sizes convenient for crystallographic applications.

Starting with a DELPHI array of diodes which have good efficency for collecting X-ray between 5 and 25 keV, we have designed a new counting chip with pixel sides of 0.3um. Each pixel consists of an analogic low level discriminator and a real 16 bits counter. An overflow mechanism has been implemented and a counting rate higher than 1e7 photons per second is expected, allowing a dynamical range of more than 7 magnitude orders and real time data collection performence.

The chip is now manufactured and a small prototype detector is being built. It will contain (2x5) chips of (24x24) pixels, i.e. a 16x40mm2 detector with 5500 pixels. After the electrical tests, real X-ray tests are scheduled for the end of the year.

We expect the prototype will show a significant improvement in detection perfomrence and anticipate a similar improvement from the full size detector, which will consist of 1 million pixels.