01.1–4 CRYSTALLOGRAPHIC STUDIES OF GLUCOSE ISOMERASE USING AN AREA DETECTOR. By D. Ringe[1], G. Quigley[2], Y. Civelecoglu[3] and M. Deutsch[3], Department of Chemistry[1], Department of Biology[2], Department of Physics[3], Massachusetts Institute of Technology, Cambridge, Massachusetts, United States of America.

Glucose isomerase is a cobalt-containing tetrameric enzyme of MW 160,000. It crystallizes in space group $P2_122_1$ with unit cell dimensions a = 94.5, b = 98.9, c = 87.0Å and two subunits per asymmetric unit. At low resolution the diffraction pattern shows strong pseudo I_{222} symmetry. Data collection to 2Å resolution has been carried out on an area detector with spherical electrodes, controlled by a VAX 11-780. Analysis of native and platinum derivative data will be presented.

01.1–5 DATA COLLECTION FOR PROTEIN CRYSTALLOGRAPHY WITH A NEW WEISSENBERG CAMERA USING CONVENTIONAL AND SYNCHROTRON RADIATION SOURCES. By N. Sakabe[1], T. Higashi[2], N. Kamiya[1], K. Sakabe[1], K. Sasaki[3] and M. Matsushima[4].
1, Department of Chemistry, Nagoya University, Nagoya 464. 2, Department of Pharmacology, Kyoto University, Kyoto, 606. 3, College of Medical Technology, Nagoya University, Nagoya 461. 4, Department of Anatomy, Osaka Medical College, Osaka 569, Japan.

A conventional Weissenberg camera has been modified for macromolecular crystallography by N. Sakabe. This camera system consists of a monochromator, a newly designed Weissenberg goniometer with multi-layer line screens and its controller (J. Appl. Cryst. (1983) 16, 542-547). A doubly bent LiF monochromator was used with a conventional rotating-anode source and a singly bent triangular 10.7° asymmetric-cut Si(111) monochromator with the synchrotron radiation source at Photon Factory. This camera is useful for recording many reflections up to high resolution on a film with high signal-to-background ratio from a crystal with large unit cell dimensions without losing any of the diffracted beams by screens. The resulting photograph is very easy to index, and the ratio of partially recorded reflections to fully recorded reflections decreases in comparison with Arndt-Wonacott camera. The multi-layer-line screens are useful to reduce back ground when a large oscillation range will be recorded.

A software package for data processing has been developed by T. Higashi on the basis of programs for oscillation photographs coded by M. Rossman.
Weissenberg photographs of a chiken gizzard G-actin DNase I complex crystal ($P2_12_12_1$, a=42.0, b=225.3, c=77.4Å) have been taken with both X-ray sources. The exposure time was reduced by a factor 10 with SR. Using this camera equiped with multi-layer line screen, the diffraction data in a 36° oscillation range were recorded on a single film up to 3.5Å resolution (J. Biochem.(1984) 95, 889-890). Typical R(sym) value of intensities on symmetry related reflections was 0.08 with data better than 3 sigma within 4Å resolution obtained by the rotating anode-source.
Photographs of the Yb^{3+} derivative were taken at several wave lengths at Photon Factory. The comparison of experimental results under various conditions will be presented.

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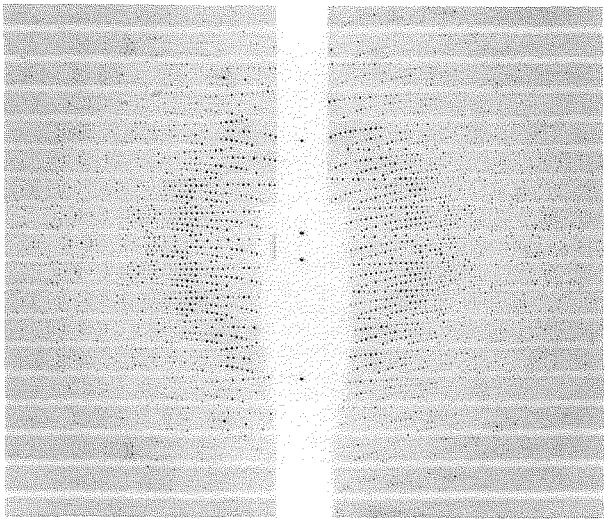

01.1–6 X-RAY DIFFRACTOMETER WITH ARRAY OF AREA DETECTORS. THE NEW MARK II DIFFRACTOMETER. By Ronald Hamlin, Department of Physics, B-019, University of California-San Diego, La Jolla, California 92093, USA.

The new Mark II X-ray diffractometer with two multi-wire counter area detectors and rotating anode X-ray generator is now in routine operation collecting protein crystallographic data at UCSD. In its present two-detector form it is capable of measuring about 100,000 reflection intensities per day from medium quality protein crystals with resulting intensity R factors of 4% to 6%. In its first months of operation (late 1983-early 1984) it was used to collect the data used to solve three new protein structures with unit cell dimensions in the range 100-200 Angstroms (DNA polymerase, histidine decarboxylase, and the active form of aspartate transcarbamylase). In the near future two more area detectors will be added to give a four detector array. Recent data collection results and data collection statistics will be presented at the conference along with a description of the diffractometer itself.