InterCAT Technical Working Group Meeting

May 18, 2000

Agenda Review and TWG Activity Summary:

Steve Heald called the meeting to order and reviewed the agenda.

Facility Reports

Facility Update/News: (Steve Davey)

Steve announced that he is still waiting to hear from Oxford about an extension of the cryocooler maintenance contract.

CAT Reports

Conceptual design of an automatic sample mounting and retrieval system for macromolecular crystallography - increasing throughput 3 - 5 times - Gerd Rosenbaum

Gerd summarized the needs for macro-crystallography sample mounting. Automation is possible because they operate with a fixed setup, and desirable since the data acquisition time is short. This is especially the case for SER-CAT with many users. A workshop held at Stanford the previous week looked at all aspects of the problem including: crystal growing, mounting and centering in the beam. Gerd summarized the workshop agenda.

As measured at SBC, the mounting time is about 7 minutes in the best case. Usually several crystals need to be mounted before a good one is found. Then the acquisition time is about 400 sec. In general the mounting time greatly exceeds the acquisition, and a significant reduction in mounting time would greatly improve throughput.

SER-CAT has commissioned Oceaneering Space Systems (OSS) to develop a conceptual design for a sample handling system suitable for an SBC type setup. They are also building an automated for the International Space Station. He presented details of the design. It is comprised of a commercial robot with a custom sample mount and a sample rack with 96 samples on 8 cartridges. A key feature of the design is a automated x-y sample positioner with the same size as the existing SBC manual positioner.

A representative from OSS was also available to answer questions about their design.

Preliminary test of an automated sample mounting mechanism - Deming Shu

Deming summarized the work that the APS is doing in collaboration with SBC on a different approach to sample automation. They avoid a miniature x--y mount by using kinematic mounts and pre-alignment offline. The complete system includes: a pre-alignment stage, barcode reader to identify samples, sample mounting holder with a few micron reproducibility, and a gripper for moving the samples. He presented the results of tests that validate positioning reproducibility of 2-3 microns. Work is ongoing to integrate the mounting system with a complete experiment.