InterCAT Technical Working Group Meeting
February 20, 2003

Agenda Review and TWG Activity Summary: (Reinhard Pahl)
Reinhard called the meeting to order and reviewed the agenda.

APS Updates/News

(Steve Davey, AOD)
Two CATs will enter the construction phase for their sectors soon. Construction of the radiation enclosures in Sectors 23 (GM/CA) and 24 (NE) was awarded to TECKNIT. Steve is providing the technical interface; please contact him if there are any issues or concerns.

(Roger Klaffky, AOD)
Roger is asking for comments and feedback on the recent "high-current" operations (112mA with top-up).

(Glenn Decker, AOD)
The accelerator group has put a lot of efforts into the beam stabilization. Implementation of the "Decker distortion" is part of these efforts. Recently insertion device Xbpm gap feed-forward controls have been tested at Sector 34. Based on various lookup tables the (vertical) beam position fluctuations associated with ID gap changes were improved from ~40 microns to ~4 microns. To view the corresponding beam position diagrams see the file Decker_030220 at the TWG website www.aps.anl.gov/cats/twg/.
Currently the orbit correction system is working at a rate of 2Hz – there are plans to increase this frequency to 30Hz. A schedule to implement the feed-forward system on all sectors is in preparation (obviously only "distorted" sectors will be able to benefit from this development).

Presentations

Thermoelectric sample freezer (Julie Cross, PNC-CAT)
Julie presented design and applications for simple but very effective sample cooling units (*ref.* Cross_030220.pdf). The systems are based on Peltier elements obtained from Melcor (see also www.melcor.com for the TEC Design Guide). These sample freezers are used in microprobe experiments where size and functionality are of particular importance. For more detailed information contact Julie at jox@u.washington.edu.

First experiments with Oxford position-sensitive ion-chambers (Thomas Gog, CMC-CAT)
Thomas reported on the efforts to evaluate the performance of position-sensitive ion-chambers provided by Oxford-Danfysik. Two slightly different units were tested: both systems use saw-tooth shaped split electrodes but differ in spatial overlap and period length. The linear response function of these detectors extended over 30 to 50% of the actual aperture with a position accuracy of 3.5 and 5.0 micron, respectively.
Thomas and coworkers used standard electronic components for their evaluation. Oxford does provide a complete electronic system for their detectors but this is optional and somewhat expensive. Thomas expressed his satisfaction with the overall performance of the system; an opinion which was shared by others, e.g. S. Heald from PNC-CAT.
(The slides of this presentation are available at www.aps.anl.gov/cats/twg/, *ref.* Gog_030220.pdf.)

On-the-fly scanning with the Newport diffractometer in EPICS and SPEC (Mark Rivers, CARS-CAT)
Large diffractometer generally have a long setting time due to their high moments of inertia. To avoid the resulting extended duration of step-by-step scans Mark has developed a method providing rapid on-the-fly scanning with a positioning error of less than 0.001 degree.
Based on the Newport MM4005 motion controller and a multi-scaler (Struck 7201 or SIS 380x) Mark's EPICS tools define a complex trajectory for one or multiple axis with variable acquisition intervals; detectors are triggered at user defined trajectory positions. The software tools allow for error checking prior to execution, simple change of start and end position of a trajectory and time scaling in order to speed up or slow down an original trajectory definition.
Mark also put efforts into the development of a SPEC interface: SPEC macros are available to utilize trajectory scanning via EPICS interface.
Future work will concentrate on support of other motion controllers, e.g. Galil and OMS58, and improved performance with new MM4005 firmware or a successor model.
For more information visit the TWG website www.aps.anl.gov/cats/twg/, *ref.* Rivers_030220.pdf, and the CARS WebPages at http://cars.uchicago.edu/software/trajectoryScans.html.

Next TWG meeting:
The next meeting will be held at 10h30 on Thursday March 20, 2003 in Bldg.401, Room A1100.