InterCAT Technical Working Group Meeting
April 18, 2002

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

APS Update (Steve Davey, AOD)

Reminder: Mohan Ramanathan and Steve Davey will perform an internal assessment of the shielding and PSS configuration of every CAT around the ring to insure that all the APS documentation for the CAT's beamline equipment is consistent with the current beamline hardware. Mohan and Steve will contact each CAT at appropriate time.

APS Reports

APS Front-End Vacuum System Failure (John Noonan, ASD)
John reported in detail the detection of a vacuum failure in the front-end of 6-ID. A pulsing pressure burst with a period of approx. 40 min. was identified as a water-to-vacuum leak in the photon shutter. The beamline had to be shut down for the remainder of the run to prevent contamination of the ring vacuum. Analysis of the failing parts will determine impact on other front-end installations.
Several CATs questioned how a similar incident would be handled in case it happened at the beginning of an APS run. The APS will develop a plan/policy on how to deal with such cases.

APS/Users Retreat (George Srajer, XFD)
George provided an update on the APS/Users Retreat planned for May 15-17 at Lake Geneva. The primary goal for this meeting is to enhance communication between the facility management and its users. On the agenda are technical issues, user support, the independent investigator program, compliance issues and suggestions for a reorganization of the CAT system. A summary of the discussions and conclusions of the retreat will be presented at the TWG meeting in June.

Beam stability and beam position monitors (Glenn Decker, AOD)
[The slides of this presentation are available at the TWG web site.]
Glenn summarized the principles of beam position detection using the RF beam buttons and the X-ray beam position monitors (XBPM) and reported on upgrades and challenges for the feedback systems. The real-time feedback, a firmware system, is operating at a rate of 1.5 kHz while the orbit correction, mainly a software system, is operating at a much lower rate of 1.5 Hz. The transient effects from insertion device gap changes were clearly reduced by the upgrade from 0.4 Hz to 1.5 Hz but variations in the beam position of 2 μm can still be observed on opening/closing an insertion device. Progress has also been made in developing a feedforward system coupled to the insertion device gap. New orbit restoration software has increased the speed and accuracy of the beam positioning system after major lattice changes, e.g. low vs. high emittance modes.

CAT Presentations

Design and performance of GSE-CARS large KB focusing optics (Peter Eng, CARS)
[The slides of this presentation are available at the TWG web site.]
Summary: GSE-CARS designed a large Kirkpatrick-Baez system for their research programs in diffraction, scattering, and spectroscopy. Peter described in detail the general mechanical and thermal design issues (see viewgraphs). Commissioning tests of the GSE system showed excellent performance: The size of the double-focused Undulator-A beam was determined to 61.4 μm (horiz.) by 13.4 μm (vert.), providing a total flux density gain of 1232 with respect to the unfocused beam.

3-dimensional x-ray structural microscopy (John Tischler, ORNL)
[The slides of this presentation are available at the TWG web site.]
Summary: UNI-CAT has developed a facility for structural analysis with submicron resolution. Experimental capabilities include strain and fluorescence measurements as well as spatially resolved crystallographic analysis. Utilizing a small beam from the insertion device (100 x 50 μm^2) and a unique monochromator design in combination with KB focusing optics the experimenter is provided with a monochromatic or pink beam of submicron dimensions. This setup was used to develop a novel technique of 3-dimensional X-ray microscopy. The 3D information is derived from X-ray images obtained while scanning a differential aperture across the sample. John presented several examples for grain orientation, strain analysis and granular composition in heterogeneous samples.

Next TWG meeting:
The next meeting will be held at 10h30 on June 20, 2002 in Bldg.401, room A1100.