InterCAT Technical Working Group Meeting
March 21, 2002

Agenda Review and TWG Activity Summary:
Mark Beno reviewed the agenda and introduced the new co−chairs of TWG, Reinhard Pahl and Eric Dufresne.

APS Update (Steve Davey, APS)

Steve Davey mentioned that the Decker Chicane was completed for sector 2 to 8. The May shutdown will see the chicane performed on sector 15, 16, 17, while sectors 18,19, and 20 will be completed during the September shutdown. On April 1, a high current study period with shutter enabled is scheduled with a current as high as 130 mA. Some construction around the ring will start shortly such as 6BM. The 436 LOM is expected to be completed by early April.

Mohan Ramanathan and Steve Davey will soon 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 every CAT for an appropriate time. Finally some questions about the Fabcast contract and labor dispute were raised. Fabcast will not be excluded from future hutch contracts. The legal and contractual problems are still ongoing and people should contact Steve for further details

APS Reports

APS Retreat (George Srajer, SRI)
George presented the plan for the May 15−17 APS retreat in Lake Geneva. The goal of the retreat is to enhance the communication between the facility and its users. George presented an outline of the agenda for the meeting. There will be several invited talks on Wednesday by K. Moffat, G. Ice, M. Rivers. On Thursday a plenary session will focus on the APS needs. Several issues will be discussed in the meeting such as technical user support, Independent Investigators, publicity, funding, information flow from users. The format of TWG, CAT−CHAT, and the User Science Seminar will be discussed. On the final day, the future of the CAT system will be addressed. Please contact George for further details.

APS ID radiation damage measurements (P.K. Jobs , APS)
P.K.'s presentation should be available on the TWG web site shortly. He mentioned that the work he presented has been written up in a Light Source Note (LS 283) and it has been followed recently by two addendum, add. 1 (2000) and add. 2 (2001).

As a background for the talk, following the installation of a 5 mm vacuum aperture at 3ID (smallest gap 8 mm), the radiation dose on the two Insertion Devices have increased tremendously. It was found after several run following this installation that the flux on the third harmonics had been reduced by 50 %. The ID was pull out recently and rescanned. The flux is now back to 85 % of the ideal flux.

P.K. reviewed the radiation monitoring program at the APS. The measurement are based on two sets of radiochromic films, two upstreams and two downstream from the undulator. His Fig. 1 showed that the typical radiation dose for an APS ID is about 1−2 Mrad per run on the upstream and 0.1 Mrad upstream. Fig 2. showed that the upstream radiation dose is caused by high energy photons (more dangerous), while the downstream is only caused by low energy X−rays. Following the installation of the 3ID 5 mm chamber, (Fig 3) the upstream and downstream doses per run became well beyond 50 and 10 Mrad. For 3ID, the upstream dose is now higher than the downstream dose. Cumulative doses were shown in Fig 4 and the table on page 5. 3ID has suffered a cumulative average dose of 234 and 255 Mrad for its two devices well beyond the 20 Mrad which is typical for other ID around the ring. P.K. expects a typical ID at the APS to reach the 3ID dose in another 30 years. Several questions were raised by attendees. Does 3ID act as a scraper for the ring? What can be done to reduce this effect? What is the future of small gap chamber? It seems that an additional TWG presentation will be needed to present a plan of action to mitigate 3ID's problems.

Canted Undulator design (Pat Den Hartog , APS)
Pat presented the design of the new canted undulator layout. Two undulator separated by a dipole magnet and sandwiched by two dipole magnets are used to produce two undulator beams separated by 1 mrad. The chosen ID is a short 2.07 m Und. A (3.3 cm period). The vacuum aperture is 7.5 mm wide, and new ID extrusions were conceived. The FE design should sustain operation at 200 mA, and 10 kW per ID. This represent a challenge for the FE, never done before. Extensive thermal analysis was performed.

The first ID and FE is expected by spring of 2003. Three different sectors (GMCA,NE and SGX CAT) will have this new layout. A question was raised as to why was the 3.3 cm device used for this application, and not the 3 cm device which has the benefit of significantly reducing the heat load on the FE and X−ray optics? Pat answered that the UA was the only device available to satisfy the tight installation deadlines.

Ultrafast Laser Excited EXAFS (Dale Brewe , PNC)
Dale's talk will be available to download on the TWG web site shortly. Please see the slides since they are quite detailed and complete. PNC−CAT has designed a very efficient fs−pulsed laser system with a repetition rate of P0 or 272 kHz, with high enough pulse energy (4 micro J) to perform microbeam XAFS experiments at the APS. Dale presented the system and the experimental set up (see slides). EXAFS measurements at PNC were possible to collect in a half hour on a 200 nm Ge free standing thin film, 0.06 mm in diameter. The laser alignment with the microbeam was found to be difficult, and some problems with Ge oxidation were found. Dale concluded with preliminary data on the Ge films. Such a system may become replicated several times over around the ring since it is optimized for the APS bunch timing and brilliance.

Ultrafast Laser−pumped X−ray probe Spectroscopy of GaAs (Bernhard Adams , APS)
Bernhard slides will also be available on the TWG web site and are also quite complete, thus please refer to the slides for details. The talk was based on a proposal by Bernhard for a fs X−ray detector in NIMA (2001). Bernhard presented a technique he used at

MHATT−CAT to observe the X−ray fluorescence yield changes in GaAs due to a fs−UV laser excitation. With the X−ray energy set just below the Ga absorption edge, with laser on it is possible to excite electrons to the conduction band and observe after some delay the X−ray fluorescence. His recent results were limited to the long core hole lifetime of 200 ps in GaAs. With sub eV X−ray resolution, this technique may be able to observe changes in the yield below a ps. A preprint of his measurement is available.

Next TWG meeting:
The next meeting will be held at 10h30 on April 18, 2002 in room A1100.