

# Weekly Report for 08/24/2015

## APS Renewal and Upgrade

- Continuing work on BTS line design. (Aimin Xiao)
- Continuing work on Touschek beam loss distribution with different collimator scheme. Gave an update report on MBA-phy group meeting. (Aimin Xiao)
- Discussed with Melike on required injected/stored beam trajectory inside the Lambertson magnet. (Aimin Xiao)
- Summarize injection beam loss distribution to Brad for his radiation shielding simulation. (Aimin Xiao)
- Attended MBA Beam Physics and Injector Working Group meetings. (Jeff Dooling)
- Continued booster simulations with impedance and apertures. Found that if everything else is working right these should result in small losses up to 10 nC injected charge. Began thinking about how to include rf beam loading in the booster. (Ryan Lindberg)
- Tweaked existing collective effects talk for CD1 review. (Ryan Lindberg)
- Optics design and optimization of high beta insertion at injection septum. (Yipeng Sun)
- MOGA optimization of APS upgrade lattices with high beta insertion at injection septum. (Yipeng Sun)
- Presented progress on ion simulations with both SLAC and CERN codes at the injector working group meeting. (Joe Calvey)
- Continued simulations and analytical calculations of possible ion instability at the APS-U. (Joe Calvey)
- Added several improvements to CERN FASTION code. Ions now persist turn-to-turn, and are lost if they reach the chamber wall. Also created more realistic input files, with additional interaction points and realistic gas composition. (Joe Calvey)

## MCR Operations

### Linac Operations

- Thursday held annual review of the 411 LCA with B. Broocks (LSO) and E. Chang. The LCA was approved for another year of operation. (Jeff Dooling)
- With G. Markovich, (SI-AES), tested functioning of linac shutter while pc gun drive laser was de-energized; shutter will open with bypass key after LACIS Start button is pressed. (Jeff Dooling)

## APS Machine Studies

### Storage Ring Studies

- Measured lifetime. (Yipeng Sun)

### PAR Studies

- Assisted C. Yao with PAR 1 Hz studies. (Joe Calvey)

### Linac Studies

- Participated in pc gun studies with Yine Sun on Tuesday; was able to steer beam through the

L1AS1 structure. (Jeff Dooling)

- Found I had used a UV AR-coated lens in the telescope between the regen and compressor to reduce the spot size through the doubling crystals. According to S. Kim of Lattice ElectroOptics (LEO), the coating would have cost about 5 percent per surface in reflection losses or roughly a 10 percent loss of IR for the lens. (Jeff Dooling)
- Ordered new IR AR-coated lenses. (Jeff Dooling)

## APS Machine Research and Development

### Storage Ring Research and Development

- Investigated possible reasons for the anomalously high impedance of the 5mm gap tapered transition that was installed in Sector 4. Found that pumping ports should not significantly impact vertical impedance; the most likely culprit identified was the large weld beads that were discovered where the transition and ID were joined. (Ryan Lindberg)
- Modeled beam blowup during an ID impedance measurement due to the monopole component of the transverse wake (looks like it should be a small effect). (Joe Calvey)

### Linac Research and Development

- Asked C. Doose (MD-ASD) if he could measure the response of small corrector magnet for possible use as a bucking coil for the interleaving magnets. (Jeff Dooling)
- Doose said he could do the test and a magnet was delivered to his office on Friday. (Jeff Dooling)
- Continued work on script to calculate harmonic laser spot size, pulsewidth, and energy. (Jeff Dooling)

## APS Machine Software

### Injectors

- continue working booster new AFG software. Tested booster ramp load for new AFG boards, it worked, and made the verify work for new AFGs. Modified BoosterCorrectorControl, Booster4CorrectorBumpScan, Booster4CorrectorDCBumpScan to work for the new AFGs, which is being used in operation now. Wrote single corrector scan for both AC and DC correctors, ready for test. (Hairong Shang)
- did booster DC ramp study with CY, made the booster corrector scan work for new AFGs; attended Booster new AFG review meeting, will make the software ready for all correctors and keep the existing software work for old systems. (Hairong Shang)

### General

- Karen reported that SCR sddscsr sever was running after machine studies (mostly use by Louis), this caused the channel access problem. Searched and studied how to kill background running jobs when logout, modified SR .logout script to kill the background running jobs at logout. However, it only works for logout from shell, does not work for logout from gnome. Searched and found that to kill the background running jobs at logout from gnome, this file need to be edited: /etc/gdm/PostSession/Default -- asked IT to add "pkill sddscsr" to this file, it was not being done yet. Will discuss with Brain Rubinson. (Hairong Shang)

## Publications, papers and report

- Updated the "Photo Injector Drive Laser Room (A103A) Injector Test Stand (A103B) Access

Requirements document. (Stan Pasky)

- APS -1442159 (Stan Pasky)

## Meetings, workshops, conferences, committees, LMS related, and reviews

- Reviewed a paper for Physical Review Special Topics. (Yipeng Sun)
- Reviewed three papers for Nuclear Instruments and Methods in Physics Research Section A: Accelerators. (Yipeng Sun)
- Tracking Aug/Sept maintenance activities for the injectors. (Stan Pasky)
- Participated in a T-cav meeting to discuss machine protection requirements as well as - (Stan Pasky)
- Waveguide layout drawings for the proposed setup at L6 (Stan Pasky)
- Position of vacuum pumps and controller numbers used for each mode including pumps and controllers used for T-cavity test in gallery (Stan Pasky)
- Water interlock levels and switches that will be used for each mode and the upcoming T-Cavity test in the gallery (Stan Pasky)
- Installation schedule for the T-Cavity test in gallery and T-Cavity in the tunnel. (Stan Pasky)
- Participated in the a meeting to discuss whether to install new AFG and ADC module to all (79) the booster correctors. As a result the Power Systems Group have agreed and recommended to move forward with the installation of the remaining hardware. We will attempt to close the Booster around Sept 15th (in the evening) for corrector ramp test prior to start up. (Stan Pasky)

## Education, Mentoring and outreach

- Gave some advice to Medani (IIT graduate student) regarding the preparation of his proposal for his upcoming comprehensive exam. (Ryan Lindberg)
- Gave some guidance to Kwang-Je's undergrad research student regarding developing coherence in SASE FELs. (Ryan Lindberg)

## Safety and Required Training

- Attended - ESH109 Cardiopulmonary Resuscitation (CPR) Training (Stan Pasky)

## Miscellaneous

- Took 1 day vacation off. (Aimin Xiao)
- took 3 days vacation and 1 day sick leave. (Hairong Shang)