

# Weekly Report for 01/12/2015

## Highlights

- Linac Startup and supported personal and equipment validations. (Stan Pasky)
- Startup machine protection validations (Stan Pasky)
- Linac RF Waveguide Switching System validation (Stan Pasky)
- Annual BESOCM Trigger Chassis validation (Stan Pasky)
- L1:PG1:GV2 needs an additional switch for monitoring gate valve position. This gate valve is monitored by ACIS. The new contacts for L3 in mode 4 operation along with the ACIS contacts have been validated. (Stan Pasky)
- Created new PEMtools for PCGun support. (Stan Pasky)
- Created remote control of a cooling fan for the PCGun bending magnet. (Stan Pasky)
- Investigate and troubleshoot vacuum readings on ion pumps L1:RG2:VP:01 & 02 the indication were 4 decades apart. Possible sediment build up in the pump. Cycling the pump controller provided a temporary fix. Pump are now functioning with-in less than a decade. (Stan Pasky)
- Supported linac startup and beam operations. (Stan Pasky)
- Continued multiparticle tracking for the abort kicker, and presented results at the AOP physics meeting. Added the calibrated lattice model to include x-y coupling, and varied the waveform and peak kick to study the effect on loss positions. Generated a loss distribution for J. Dooling for use in MARS simulations at the thin septum. (Kathy Harkay)

## APS Renewal and Upgrade

- Prepared collective effects talk for the MAC review, gave dry-run, made further improvements to talk. (Ryan Lindberg)
- Continued simulation effort of the elliptical chambers. (Ryan Lindberg)
- Took a look at LEUTL to see if it might be useful for impedance testing with PC gun beam. (Ryan Lindberg)
- APS upgrade MAC review and dry run: alternate lattice section. (Yipeng Sun)
- APS upgrade lattice design with anti-bend. (Yipeng Sun)
- MOGA optimization of V6 lattice. (Yipeng Sun)
- Continue work on CDR revision with new injection simulation results. (Aimin Xiao)
- Check simulation results with new aperture definitions (ID aperture from 20x6 elliptical to 12x6 elliptical). Results looks same from the injection efficiency simulation point of view. Loss locations and passes are slightly different. (Aimin Xiao)
- Participated in dry runs (in the audience) for the MAC. (Kathy Harkay)
- Produced a slide on the abort kicker concept for A. Zholents for the MAC review. (Kathy Harkay)
- Produced various plots and a slide relating to SCU0 for E. Gluskin's MAC review talk on ID development. (Kathy Harkay)

- Discussed Cornell Synrad3D code training with B. Stillwell for comparison with the CERN Synrad code. (Kathy Harkay)

## MCR Operations

### Linac Operations

- Retuned the PC Gun laser bringing UV energy back up to 55-60 uJ (EM2). (Jeff Dooling)
- Worked in the linac tunnel setting up alignment screen, energy monitor, and cameras with tunnel in Controlled Access mode. (Jeff Dooling)

## APS Machine Studies

### Storage Ring Studies

- Prepare for studies. (Yipeng Sun)
- Provided SR study topics to L. Emery. (Jeff Dooling)
- Discussed reinstallation of fast FO BLMs in ID1 with K. Harkay and J. Grimmer. Will install one BLM on the US and another on the DS ID. Gave J. Grimmer another FO bundle. (Jeff Dooling)
- Presented summary of 2014-3 studies, and plan for startup. (Kathy Harkay)
- Proposed 6 GeV studies, in light of L. Emery's conclusion that a longitudinal feedback system is required for MBA. (Kathy Harkay)

## APS Machine Research and Development

### Storage Ring Research and Development

- Investigate CPU multipole offset and correction table settings. Discussed with Louis on what realignment we should ask about CPU and sent out final request. (Aimin Xiao)
- Presented results at AOP physics meeting of multiparticle tracking and loss positions for the new abort kicker waveform for four cases: 100% and 80% of design peak kick and with and without the collimator. (Kathy Harkay)
- Repeated abort kicker tracking using calibrated lattice model, which includes x-y coupling. The results are quantitatively different, but the general conclusions are the same. (Kathy Harkay)
- Discussed the thin septum magnet chamber geometry with J. Dooling. Studied the drawings and input the model as a stepped series of MAXAMP elements in the elegant lattice file. (Kathy Harkay)
- Constructed a kicker waveform using the rise time from IK1 and the fall time from Ju Wang's 3-coil-turn design. Compared tracking for a 1-mrad peak kick, which preferentially loses beam at the septum. The faster rise causes fewer bunches to survive the second turn, while the slower kicker rise loses beam at the septum more evenly between the first and second turns. All the beam is lost in 2 turns in either case. (Kathy Harkay)
- Generated an elegant loss distribution for J. Dooling that he can use as input to a MARS simulation of one bunch lost on the septum chamber. Tracked the phase space params back from the loss point (in s) to the beginning of the injection straight, using calibrated lattice model. (Kathy Harkay)

### Linac Research and Development

- Presented a discussion of PC Gun laser measurements at the PhotoInjector Physics (PIP) meeting.

(Jeff Dooling)

- Started an email discussion with Y. Li (XSD-TRR) regarding laser beam spot size and positioning control used in Sector 7. (Jeff Dooling)
- With Y. Sun, visited J. Power at the AWA accelerator. J. Power gave us a tour and description of the pc gun laser system delivery optics and control system. (Jeff Dooling)
- Lent Power a spare DG535 used for the PC Gun timing system. (Jeff Dooling)

## APS Machine Software

### AOP Applications Software

- Fixed the bug inside insertSCEffects.cc related to the parallel version of elegant. (Aimin Xiao)

### Storage Ring

- worked with Shifu Xu on the new RTFB testing for sector 27 and 28, which uses 2 bpms and 2 correctors in each sector each plan (A:P0, B:P0, A:H3, B:H4 for h plane for example). Tested various methods, finally, we decided to use current waveform convention. Therefore, I modified srfbNewLoadMatrix for loading RTFB matrices, bpm and corrector configs for S27/28, loaded the 4x4 matrices and configs for both plans into new S27/28 RTFB ioc. (Hairong Shang)
- working on P0Feedback improvement to automate the bucket sample pattern determination, proper setting of attenuator through attenuator scan, and optimizing mixer delays. Currently, they were manually setup by CY through running ExperimentDesigner. (Hairong Shang)

### General

- per CY and power supply group's request, wrote scripts for recording booster S2S scope data every 5 seconds and logged the data at /home/helios/oagData/booster/scope/S2Sdata. (Hairong Shang)
- CY reported sddsprocess segmentation error, recompiled sddsprocess without changes, no errors occurred. Discussed with Bob Soliday, it turned to be a bug introduced in scan\_args, Bob fixed the bug in scan\_args. (Hairong Shang)
- Tom Forres found several bugs in sddsfft, fixed the bugs of sddsfft through correcting the window correction factor computation (which should start from 0 instead of 1) and the windowing computation of imaginary input data. (Hairong Shang)

## Publications, papers and report

- APS upgrade CDR: alternate lattice section. (Yipeng Sun)
- Reviewed referee comments on SCU0 paper. (Kathy Harkay)

## Education, Mentoring and outreach

- Helped give Medani a tour of the APS tunnel. (Ryan Lindberg)
- Wrote first draft for Joe Calvey's research proposal for the Director's Postdoc. (Ryan Lindberg)

## Safety and Required Training

- Went to lock-out tag-out training. (Ryan Lindberg)
- Lock out training. (Yipeng Sun)

## Miscellaneous

- Went to APS tunnel to see various changes made during the shutdown. Discussed with CY on the mystery beam orbit at the beginning of BTS line. (Aimin Xiao)
- Made a list for next run machine studies. (Aimin Xiao)