

Weekly Report for 05/11/2015

Highlights

- This is a one-week report. (Kathy Harkay)
- Organized the kick-off meeting for the Injector Working Group. (Kathy Harkay)

APS Renewal and Upgrade

- Participated in MBA radiation physics meeting Friday. (Jeff Dooling)
- Calculated stored beam orbit distortion from the Lambertson leakage field. (Aimin Xiao)
- Continue work on injection simulation with longitudinal mismatched beam (Aimin Xiao)
- Continued discussing Booster upgrades and PAR/Booster charge limitation with CY Yao. Organized the first, kick-off meeting for the Injector Working Group for Fri, May 22 and discussed the agenda with CY and Joe Calvey. (Kathy Harkay)
- Reviewed the Injector-related sections of the APSU CDR. Started preparing the intro for the Injector WG meeting. (Kathy Harkay)
- Attended APS-U Physics meeting. (Kathy Harkay)

MCR Operations

Storage Ring Operations

- With A. Brill and M. Merritt, re-installed the fast BLM in the US ID. (Jeff Dooling)
- Using channels 1, 3, and 4 in the six pack (last run used channels 1 and 2 for US and DS detectors, respectively). (Jeff Dooling)
- Followed up with Marty Smith and Jim Stevens on the status of the SCU1 warm transition thermocouples and asked M. Smith to fix an error on the medm screen (wrong PVs). (Kathy Harkay)
- Ensured that all SCU1 PVs are in the data logger, including the vacuum PVs; also that the Autosaved sddsplots is up to date for ID1/SCU1 Asked R. Soliday to add SCU1 back to the APSStatus Android app. (Kathy Harkay)
- Discovered that VM:06:VGSCU1 cold cathode vacuum gauge (DS od SCU0) was reading zero, and followed up with J. Gagliano and Marty Smith, who had it fixed. (Kathy Harkay)

Linac Operations

- During the maintenance period, RG2 is swapped from 3G2 (with 0.141" shims) to 3G3 (with 0.189" shims). After the cathode is activated by the vacuum group using a portable power supply, I worked on setting up the gun front end beam line in order to deliver over 1.1nC bunch charge per pulse to PAR. With Stan, we setup a system reference file for operations using RG2. Noticeably, the improved beam transport through the gun front end beamline allows us to operate RG2 at 150mA current, instead of 280mA as previously used. The gun kicker voltage is moderate (15kV). (Yin-e Sun)
- RG1 file was updated as well after the start up. (Yin-e Sun)
- Now we have both guns working with sufficient charge delivered to PAR. (Yin-e Sun)
- Modified the the 411 Laser Room Standard Operating Procedure including search procedure when unlocking laser. Sent draft on for review. (Jeff Dooling)

- Worked with S. Shoaf on motorized mirror control testing in the linac tunnel and laser room. (Jeff Dooling)

MCR Operations administrative/misc.

- Rewrote operators' schedule to reflect employee transferring (Randy Flood)
- Approved operators' time cards (Randy Flood)
- Approved vacation requests, set up coverage and updated the online schedule (Randy Flood)
- Approve CTLs, IT and Other work requests (Randy Flood)

APS Machine Studies

Linac Studies

- took images of the PC gun front end diagnostics flags for calibrations. (Yin-e Sun)
- Researched on possible coolant and cleaning solutions we can use for PC gun drive laser chiller, in order to prevent copper/brass corrosion and algae growth. (Yin-e Sun)

APS Machine Research and Development

Storage Ring Research and Development

- Continued discussing SCUs with S. Casalbuoni at ANKA. (Kathy Harkay)
- Presented ANKA SCU development (WEBD3) at weekly AOP Physics group meeting (IPAC15 review). (Kathy Harkay)
- Finalized SCU1 Physics Requirements document and posted latest version in ICMS. (Kathy Harkay)
- Discussed the SCU1 XBPM orbit control commissioning step with L. Emery and added it to the SCU1 Commissioning Plan (CP). (Kathy Harkay)
- Discussed the ID1 FE power-limiting system controls test with M. Smith and added it to the SCU1 CP. (Kathy Harkay)
- Completed updates to the SCU1 CP and reviewed it with the physicists at the weekly AOP machine physics meeting. (Kathy Harkay)

Linac Research and Development

- Estimated the body temperature needed for the gun (3G2) taken out of RG2 to be around 54C if 0.200" shims are installed to have the cathode surface flush with gun back plate. Discussed with colleagues on steps to be taken on 3G2 operations. We will increase the heater capacity at ITS first to test 3G2 at 54C. If successful, we will duplicate the set up for RG1 and RG2 water stations. (Yin-e Sun)
- Studied linac structure survey data, compared 1999 data and 2013 data. Found the sagging of the structures occurred in between the two existing surveys. Discussed with RF group on the priorities of structures to be taken out of the linac. (Yin-e Sun)
- Completed diode testing at Fermilab; measured the light output of the used diode set. (Jeff Dooling)
- Slope efficiency indicates at 16.8 percent reduction in light at a given current relative to the new set.

(Jeff Dooling)

- Presented results of pump laser diode testing done at Fermilab at the Photoinjector Physics (PiP) meeting Wednesday. (Jeff Dooling)
- Energy loss in the heads appear to be due to reduction in light output from the existing diode and partial blockage of pump light due to material on the surface of the laser rods. (Jeff Dooling)
- Multiple pulses out of regen probably due to bad pockels cell(s) or power supply (HV). (Jeff Dooling)
- Before removing the rods for cleaning will reassemble the heads with the existing diodes and try to optimize pockel cell performance. (Jeff Dooling)
- Completed head reassembly. (Jeff Dooling)
- Contacted the laser rod manufacturer Schott North America for assistance on cleaning the phosphate glass rods. (Jeff Dooling)

APS Machine Software

Storage Ring

- added sector argument to holdVCPosition so that it works for other bpms too, tested with S27 and S28 BPMs, they can be controlled at the same through starting two applications independently. However, the S28 heater did not work as expected, it started heating up only after turning on for 20 seconds, easily got overshoot -- Diag group people was looking into it. (Hairong Shang)
- added printing out message to getP0FBTune for empty bunch pattern before exit instead of doing nothing, so that user would know what is wrong. (Hairong Shang)
- discussed with Nick, Louis and Marty for software development for SCU1 installed at ID01ds, started working the gap scan scripts. (Hairong Shang)
- added parameter elegantEntry to P0FeedbackFilterTool, it writes the non-zero filter values into elegant entry format in the filter output file to prepare for feedback simulation using elegant. (Hairong Shang)

Injectors

- worked with hairong Shang to combine the steps I developed in setting up the gun front end lattice into an OAGapp for operations to use. (Yin-e Sun)
- added booster BPM 10 time segment PVs to Booster SCR. (Hairong Shang)
- modified measureLinaceEmittance for BTS system, added dipole element to include energy spread for computing BTS emittance. (Hairong Shang)
- wrote LinacRGGunTuneUp script for tuning RG1 and RG2 guns. (Hairong Shang)

General

- wrote sddsconvolve2d.c with direct method, under testing. (Hairong Shang)

IOC/EPICS/Controls/Linux/Solaris/Linux Clusters/Data Loggers/Simulation software

- Finished building EPICS 3.14.12.5 and associated libraries (Randy Flood)
- Administer the EPICS CVS repository to ensure current versions are installed and conflicts are

tracked down and eliminated. (Randy Flood)

Publications, papers and report

- Found an error in the ICFA Newsletter article and sent correction to editor Rainer Wanzenberg. (Kathy Harkay)
- Updated TN "APS Higher-Current Operation Milestones", adding the 130-mA studies (4/28/2015) (Kathy Harkay)

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

- Hosted a Photo-Injector Physics meeting. (Yin-e Sun)
- Served on the APS linac structure straightening committee. (Yin-e Sun)
- Participated the Emittance Exchange experiment at AWA/ANL. (Yin-e Sun)
- Attended machine start up testing for LIST timing module; attended ASD seminars and group meetings. (Yin-e Sun)

Miscellaneous

- Compiled stats for the run (Randy Flood)
- Read IPAC15 papers. Discussed some issues with outside people. (Aimin Xiao)
- Provided elegant run support to people working at Jefferson lab. (Aimin Xiao)
- Took half day sick leave. (Aimin Xiao)