

Weekly Report for 04/14/2014

Highlights

- Setup optics for next start up with punched down correctors and removing ID28 H bump. (Aimin Xiao)
- Completed the development and test of IRamp mode of booster ramp correction. The new mode will be made official starting next run. (Chih-Yuan Yao)
- Investigated the detailed specs of the FID high voltage feedthrough with help from Leonard Morrison, Ju and the vendor. (Chih-Yuan Yao)

APS Renewal and Upgrade

- Calculated the phase space ellipses for extreme orbits at all the MBA dipole exits, given a limiting full x,y aperture of 6 mm at the IDs. Used method described by V. Sajaev in APS_1431564. (Kathy Harkay)
- Start simulate inject bunch with mismatch and jitters (Aimin Xiao)

MCR Operations

Storage Ring Operations

- Analyzed issue with recovering SCU0 user main coil current setpoint after quench on 4/14, with M. Smith. We reviewed the logs and discussed a software change, which M. Smith implemented. (Kathy Harkay)
- Attended SCU0 Team weekly meeting to discuss SCU0 warmup on 4/14. (Kathy Harkay)

Booster Operations

- Replaced broken booster beam current scope in MCR with Diag group technicians. (Chih-Yuan Yao)

Linac Operations

- walk through the klystron gallery and linac tunnel. Discussed about the possibility to add extra water cooling station for PC gun when installed at Linac tunnel. checked out extra BPM slots for added beam diagnostics for PC gun beam in linac. Took pictures of the linac front end showing laser transportation, waveguide end to be connected to PC gun; suggested to extend the laser transportation pipe (instead of drilling a new penetration hole on the wall between laser room and linac tunnel) to accommodate the new photocathode gun z-location. (Yin-e Sun)

ITS Operations

- Conducted Quarterly LACIS validation with J. Mazzio Tuesday. (Jeff Dooling)

APS Machine Studies

Storage Ring Studies

- Continued studies of SCU0 BLM signals vs beam dumps with MPS or IK5 only, and MPS+IK5, with J. Dooling. The loss patterns for MPS+IK% were as expected, but the integrated beam losses, the only thing we can measure, did not decrease. Summarized results at the weekly TOM meeting. Okay'd removing ID28 horizontal bump since it does not prevent quenches. (Kathy Harkay)
- Setup optics for next start up with punched down correctors and removing ID28 H bump. (Aimin Xiao)
- Perform orbit switch from RHB to 324. (Aimin Xiao)

- Measure ID04DS and ID13US perturbation. Discussed with Isaac on the measurement results. (Aimin Xiao)
- Successfully tested a SR tune measurement that uses combination of MXA and VSA. Got good quality tune and chrom data. (Chih-Yuan Yao)

Booster Studies

- After completion of IRamp mode of autoRampCorrection, optimized QF and SD ramp with non-linear corrections. Achieved 6 nC BTS beam charge with 92-nm low emittance lattice. (Chih-Yuan Yao)

Linac Studies

- Studied L3:AM1 spectrometer current needed to center beam on the near screen (L3:FS1) and far screen (L3:FS3) for beam energy 145-150MeV. Saved beamline set up files and beam image. (Yin-e Sun)
- https://logbook.aps.anl.gov/elogs/MS/Machine_Studies/94 (Yin-e Sun)

ITS Studies

- Commissioning work continued on the pgun. Recorded images on the YAG straight and bend screens. (Jeff Dooling)
- Let laser run continuously at 6 Hz from Wednesday morning through the following weekend. Laser ran without incident. Made minor adjustments in the regen and compressor while maintaining illumination on the photocathode. (Jeff Dooling)
- With Y-E Sun, made initial phase- and quad-scan measurements. (Jeff Dooling)

APS Machine Research and Development

Booster Research and Development

- Investigated PAR and booster radiation safety and operating envelope history, and top-up procedure, with Nick Sereno and Michael Borland, and drafted proposal for an upgrade of injection operating envelope in order to accommodate high charge injector studies. (Chih-Yuan Yao)
- Observed booster BM ramp current pulse width variations. And the observation was confirmed by local scope measurement at the supply by Ju Wang. The variation is due to clamping (or free wheeling) or the ramp supplies. (Chih-Yuan Yao)

Linac Research and Development

- continued working on the PC gun front end beamline elements design. Added quads and BPM in the spectrometer line, shorten the line such that the spectrometer screen and the first screen in the straightline is placed at equal distance downstream of the spectrometer dipole. Moved a steering magnet upstream of the spectrometer dipole. (Yin-e Sun)
- Discussed "ideal" and "acceptable" beam diagnostics crosses/cubes, worked out the physics requirement for these cubes. visited AWA beamline and discussed with colleagues, for the spectrometer yag screen, determined to use their 2" YAG screen. Wrote a request for quotes for the 1" YAG screen to Crytur. (Yin-e Sun)
- Attended PCGun/TCAV meeting and discussed requirements for moving the laser optics enclosure back to the linac tunnel during the August-September shutdown. (Jeff Dooling)

ITS Research and Development

- requested to move one H/V steering magnet upstream of first quad in the beamline, otherwise the beam can not be centered in the quad. (Yin-e Sun)
- We measured the PC Gun beam emittances for different laser spot size and charge. Either Q3 or Q4 is scanned and beam sizes are measured on the straight line YAG screen, emittance values are extracted from the quadrupole scan measurements. (Yin-e Sun)
- We also measured beam energy for various RF gradient. Beam trajectory prior to the spectrometer is not certain due to a lack of BPM or YAG screens. This could have influenced the absolute beam energy measurement. (Yin-e Sun)
- Due to the small YAG screen size (1/2 inch only) on the spectrometer screen, we turned on Q5 to reduce the dispersion to about half of its value without quad on. We measured energy spreads. (Yin-e Sun)
- Measured the distance between the spectrometer dipole and the YAG screen at ITS, computed dispersion at the spectrometer screen using both matrix multiplication and elegant simulation, results agrees. (Yin-e Sun)
- Monitored the QE of the cathode. (Yin-e Sun)
- https://logbook.aps.anl.gov/elogs/MS/Machine_Studies/91 to https://logbook.aps.anl.gov/elogs/MS/Machine_Studies/96 (Yin-e Sun)

Other Research and Development

- Cathode R&D: Discussed a new idea for a superconducting photocathode with K. Nemeth. (Kathy Harkay)
- Cathode R&D: Assisted Z. Yusof (IIT) with hardware formerly purchased for the cathode LDRD. (Kathy Harkay)
- Electron cloud R&D: Reviewed L. Boon's draft paper on QE measurements on APS AI chamber samples, and provided suggestions. (Kathy Harkay)

APS Machine Software

AOP Applications Software

- build a new lattice for ITS beamline current layout, and it is called by the newly added "ITS quad scan emit meas" OAGapp by Shang (modified the LINAC quad scan emit meas script). helped to identify the PVs used in the script. (Yin-e Sun)
- requested the addition of "ITS PC gun phase scan" (modified by Shang from the old pc gun phase scan program) and helped to change the PVs in the script. (Yin-e Sun)

Storage Ring

- meet with Nick Sereno and Marty Smith for ID1 gap feedforward software upgrade. (Hairong Shang)
- measured SR tune with MXA-VSA, getxytunes worked and was able to get the x/y tunes. However the chromaticity measurement was not successful, because we used 24 bunch pattern instead of 324. Will test the chromaticity measurement with MXA-VSA with 325 bunches next time. (Hairong Shang)

- renamed the button 'x RF Setpoint += ErrorCC' to 'x RF Setpoint += RfErrorM' in SRbpmConfig. removed ju-smasher for BM. removed ju-smasher for BM in booster IRamp correction. (Hairong Shang)

Injectors

- Updated the ITS_ModeSwitch machine procedure by adding additional ACIS checks. (Robert Soliday)
- Looked into a possible problem with the PAR RF startup machine procedure. It turned out that the system reference files had to be updated. (Robert Soliday)
- wrote fitiramp c code with no SDDS libraries (removed reading reference data from SDDS file, but read from waveform PVs), but only moved and included the need libraries, to be able to port to IOC. compiled and tested, and gave it to Shifu to install on ioc for computing booster IRamp gain and delay. (Hairong Shang)
- wrote script for Yine to postprocess IS phase scan output files and plot processed data. (Hairong Shang)
- developed, tested and installed ITSPCGunPhaseScanAndSet for scan ITS PC gun phase. And added "ITS PC Gun Phase Scan" to OAGapps and OAGapps gnome menu. (Hairong Shang)
- wrote GetBooRampVoltageWF for reading the booster ramp voltage waveform. (Hairong Shang)
- modified BRampControlAutoCorrection to automatically change the start/stop limits when switch between VRamp and IRamp. (Hairong Shang)
- wrote BIRampWaveformMon for reading booster ramp current waveforms and computing the deltaI and deltaI/I between measurement and reference. (Hairong Shang)
- added checking the auto ramp correction state to BRampControl before loading safety and correcting ramps and popup warning messages if they are different state (VRamp or IRamp state) from the auto ramp correction state. (Hairong Shang)
- added emittance measurement for ITS to measureLinacEmittance and fixed the problem of printing parameters in sddsprocess command, tested and installed. And removed "adjust aperture" for ITS since it is available for ITS. (Hairong Shang)

General

- Tested code to ensure it still cross compiles with VxWorks. (Robert Soliday)
- Updated all of our auxiliary libraries that we include with the SDDS source code, such as: gsl, libgd, libpng, xlsxlib and zlib. (Robert Soliday)
- Updated the SDDS build files so that it can be built with make -j <jobs> (Robert Soliday)
- added APSLogButtonCommand procedure to log the button clicks and added logcomm option to APSButton to optionally log the button clicks. (Hairong Shang)
- tested and installed getVXATraceData for reading the waveform data from MXA scope. (Hairong Shang)
- modified hpVecSave for saving scope configuration to work with linux fpt command. (Hairong Shang)

- added ITS system to APSConfigureCameraAndScreenPVs procedure in APSFlags.tcl (Hairong Shang)

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

- Installed two new versions of GdfidL. (Robert Soliday)
- Added Emery's writeCommandToEmacsServer function to mpl_motif. (Robert Soliday)
- Updated various data loggers. (Robert Soliday)
- Researched possibilities for a hardware upgrade to the linux cluster and got a quote. (Robert Soliday)

Web Site

- Uploaded Linux Mint 16 RPM packages for SDDS to the web site. (Robert Soliday)
- Uploaded SDDS Java build for the latest version of Redhat Enterprise Linux 5 and 6 to the web site. (Robert Soliday)
- Uploaded a new version of Elegant for all our supported operating systems to the web site. (Robert Soliday)

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

- Reviewed an APL paper. (Yin-e Sun)
- member of the AOPpostdoc search committee. (Yin-e Sun)
- participated the PC gun meetings, DWFEL meeting, AOP group meetings. (Yin-e Sun)
- Presented report at fast kicker review meeting. (Chih-Yuan Yao)

Safety and Required Training

- Took ASD125, and ASD115 training and passed the exams. (Yin-e Sun)
- Participated in the draft plan for gradual increase of the operating envelope for the PAR and Booster. (Chih-Yuan Yao)

Miscellaneous

- Reviewed 1 PRSTAB paper (Aimin Xiao)
- Helped Dooling out with a script question. (Robert Soliday)
- Helped Dooling with a plaindata2sdds question. (Robert Soliday)
- Met with Sasha. (Robert Soliday)
- Went to Box training. (Robert Soliday)
- Received Dell Latitude D630 laptop from N. Sereno; a 64-bit however with only 2 GB of RAM. May not meet the minimum requirements for Windows 7. Will check to see if BeamView and SpectraSuite s/w can work with wine. (Jeff Dooling)