

Weekly Report for 12/07/2015

Highlights

- This is a four-week report (weeks of 11/30-12/21). (Kathy Harkay)
- Served on LCLS-II DOE CD2-3 review in the Accelerator Physics subcommittee. (Kathy Harkay)
- Performed simplified simulation studies for a candidate beam abort system for APS-U, with promising initial results (88% of beam lost in Zone F, first turn after kick). Presented at weekly APS-U Physics meeting. (Kathy Harkay)
- Convened an Injector WG meeting on Nov 30. (Kathy Harkay)

APS Renewal and Upgrade

- Attended the MBA radiation physics meeting. (Jeff Dooling)
- Analysed Touschek scattering result using new collimator scheme. Made a summary report for MBA physics group meeting. (Aimin Xiao)
- Calculated timing requirement of injection system for using 117 MHz rf. So, people knows the requirement is changed and much more tight than before due to less bunch spacing and longer bunch length. (Aimin Xiao)
- Discussed with Melike that how septum requirement is obtained and should be kept in the magnet design process. (Aimin Xiao)
- Continued simulation studies for beam abort system for APS-U. Modeled 48 bunches using 48 single macroparticles. Compared beam loss locations for abort kickers in three cases: AK36 only (sector 36), AK37 only (sector 37), both AK36 and AK37. Worked to maximize (confine) losses in Zone F, first turn; found a solution for 88% of the beam. Made a plan for future simulations. (Kathy Harkay)
- Convened an Injector WG meeting on Nov 30. Presentated recent PAR measurements (with C-Y Yao and J. Calvey) suggestive of microwave instability, and potential impact on high-charge operation for APS-U. (Kathy Harkay)
- Spoke with D. Walters about the APS-U Zone F vacuum layout (he was assigned by H. Cease). Described to him components we expect to need space for, including an abort system and longitudinal feedback system. (Kathy Harkay)
- Participated in injector studies, mainly PAR, with J. Calvey and C-Y Yao. (Kathy Harkay)

MCR Operations

Storage Ring Operations

- Performed orbit switch from 24 to 324. (Aimin Xiao)
- Discussed the IEX PS issues, provided opinions on what we can do to reset the PS without causing beam loss. (Aimin Xiao)
- Discussed with Louis on unusual beam motion due to ID6 close to minimum gap. It turns out to be fake signal due to possible ID chamber movement together with P0 BPM. (Aimin Xiao)
- Discussed operations instructions for the abort kicker with K. Schroeder, L. Emery and others. Requested formal ASD approval to test during operations. (Kathy Harkay)
- During the last week of user operations (12/16-12/21), three MPS trips occurred with the abort kicker operating. Confirmed that neither SCU quenched on any of these trips. Noted an S37 rf arc trip after

one of the trips and discussed it with D. Horan. (Kathy Harkay)

- Discussed FO BLM diagnostics with J. Dooling for the new ID6 SCU18-2 and for the HSCU test chamber. (Kathy Harkay)

Procedures

- Injector Test Stand Controlled Access (APS_1666796) (Randy Flood)

MCR Operations administrative/misc.

- Compiled operational statistics (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

Storage Ring Studies

- Carried out abort kicker studies to find an operational configuration and confirm performance with 324 bunches, with V. Sajaev and J. Dooling. Prepared presentation for weekly machine studies meeting, with J. Dooling. (Kathy Harkay)
- Performed a beam-based alignment scan for the SCU1 chamber (a.k.a. ID scan), using the chamber temperatures to find the vertical position relative to the user orbit. These data will be compared to measurements next run, after SCU1 is warmed up, then cooled down again. (Kathy Harkay)

Linac Studies

- Conducted several PC gun studies with Yine Sun transporting and characterizing beam in the linac. (Jeff Dooling)
- Completed radiation survey measurements for missteered beam from the PC Gun with J. Vacca in the linac gallery. (Jeff Dooling)
- Found that the 1/2-wave plate in the uv attenuator has fogged. Presently working on getting a replacement as well as cylindrical lenses to correct for astigmatism. (Jeff Dooling)

APS Machine Research and Development

Storage Ring Research and Development

- Discussed purchase of new FO BLM components with Y. Ivanyshenkov.(ASD-MD) for SCU18-2 scheduled to replace SCU0 next August. He is willing to split the costs as we did last time for the BLMs in SCU1. (Jeff Dooling)
- Continued working on beam-induced heating of helical SCU chamber. Worked on resistive wall heating: reviewed anomalous skin effect regime, and copper conductivity vs temperature. Re-calculated synchrotron radiation heating for smaller-diameter HSCU chamber. (Kathy Harkay)
- Spoke with Mario Santana (SLAC) about his work on collimators, while serving on the DOE LCLS-II review. (Kathy Harkay)

APS Machine Software

Storage Ring

- improved new steering software 1) increase the corrector rangeError to +-50A before steering and restore the current range errors after steering, so that global orbit controllaw will not be interrupted during test failure of corrector rangeError 2) fixed launching of dialog of 25, 36-39 (not allowed sectors), they can not be launched now. 3) added save SR bpm and corrector setpoints when ID sector dialog box is launched for the purpose of undo steering. 4) added execution security control of new steering software. (Hairong Shang)
- started working on SRIDIntensityOptization and SRBMIntensityOptimization with new steering method. (Hairong Shang)
- added cobly phase shift delays to the parameters of tune measurement output files. (Hairong Shang)
- added SR colby phase shift delay entries to be able to change them and added the ability to automatically update the rf power and colby phase shift delay based on the fill pattern, tested and installed APSMeasureTunes. (Hairong Shang)

Injectors

- wrote switch to booster 1Hz or 2Hz ramp pems, tested. (Hairong Shang)

General

- importing the change of US (written in fortran) by Dejus to sddsus, which that the energy spread was considered in brightness computation, not done. (Hairong Shang)

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

- Administer the EPICS CVS repository to ensure current versions are installed and conflicts are tracked down and eliminated. (Randy Flood)

Publications, papers and report

- Worked on a draft TN calculating the work function for the PC gun. (Jeff Dooling)
- Submitted data collection update for 2013 LDRD project on graphene window for electron gun. (Kathy Harkay)

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

- Participated in L2:AS1 planning meeting (Randy Flood)
- Presented stats and operational issues to Ops Directorate meeting (Randy Flood)
- Served on LCLS-II DOE CD2-3 review in the Accelerator Physics subcommittee. Contributed to close-out presentation and final report. (Kathy Harkay)
- Continued working on TRIUMF ALD for Accelerators Search Committee. Participated in eight online (Skype) interviews. (Kathy Harkay)
- Attended a meeting of the NA-PAC'16 local organizing committee. (Kathy Harkay)
- Provided feedback on abstracts by J. Calvey for IPAC16. (Kathy Harkay)

Miscellaneous

- Made machine study schedule. (Aimin Xiao)
- Support outside user on elegant simulation. (Aimin Xiao)
- Administer multiple mailing lists and the elegant forum (Randy Flood)