

Weekly Report for 07/07/2014

Highlights

- Make a new correction table for user to run IEX circular mode at 400 eV, finished. (Aimin Xiao)

APS Renewal and Upgrade

- Continue MOGA optimization of APS upgrade lattice, with different nonlinear optics configurations. (Yipeng Sun)
- Continue work on Inj. efficiency simulation. (Aimin Xiao)
- Start look at Touschek beam loss issues for the new MBA lattice. (Aimin Xiao)

MCR Operations

Storage Ring Operations

- Investigated beam losses. (Karen Schroeder)
- Assisted MCR with turning beam over to Users. Investigated a few instances when the gap values did not return to values present before machine studies started. Relayed the information to F.C. (Karen Schroeder)
- Monitored SCU0 pressure during the week Harkay was on vacation. Noticed that the SCU0 current did not return to correct value after a beam loss which caused a quench. Informed the MCR and asked them to let the User at the beamline know. Passed the info on to Doug Robinson. (Karen Schroeder)
- Assisted MCR with issues regarding policy and coupling adjustments during injector downtime. (Karen Schroeder)

Linac Operations

- discussed with mechanical and survey group colleagues about straightening the sagged linac accelerating structures. (Yin-e Sun)
- Stopped work on Linac rf system L6 to inspect and validate machine protection interlocks related to SF6 wave-guide. This effort also required MEDM display changes. (Stan Pasky)
- Assisting MCR with injector issues as needed. (Stan Pasky)

ITS Operations

- Coordinated all work efforts between group(s) in the ITS during PCGun operations.. (Stan Pasky)

Procedures

- Updated and reviewed Injector procedures. (Stan Pasky)

Training

- Provided Linac/Par training to qualifying operators. (Stan Pasky)

MCR Operations administrative/misc.

- Prepared downtime report for OPS directorate and either gave to Flood for presentation or attended OPS Directorate myself. (Karen Schroeder)

APS Machine Studies

Storage Ring Studies

- Conducted study with K. Harkay using injection kickers triggered by MPS event to direct beam away from the SCU0 in sector 6. (Jeff Dooling)
- Presented results at the Studies Review meeting on Thursday (formerly TOM). Suggestions were offered about combining kicker pairs with delayed timing. (Jeff Dooling)
- Join machine studies, learn control software. (Yipeng Sun)
- Performed gap scans and restored X-ray bpms to orbit control configuration. which had been removed for steering. (Karen Schroeder)
- Performed orbit response measurements. (Karen Schroeder)
- Updated machine studies schedule with last minute requests and/or passed relevant information on the MCR. (Karen Schroeder)
- Reviewed and approved non-RSS SR work requests for work during machine studies and shutdown. Approved RSS work requests when CCSM is not available. (Karen Schroeder)
- Worked with M. Smith on debugging IEX control software. 2 bugs from recent control software upgrade had been identified and corrected. (Aimin Xiao)
- Test IEX utility tools with updated IEX control. Start to write a summary on the tools. (Aimin Xiao)
- Make a new correction table for user to run IEX circular mode at 400 eV, finished. (Aimin Xiao)
- Have intensive discussion on what's the photon energy limitation for the IEX circular mode. (Aimin Xiao)

ITS Studies

- Maintaining the ITS Schedule.. (Stan Pasky)

APS Machine Research and Development

Storage Ring Research and Development

- Also with K. Harkay organized a meeting with A. Zholents, E. Gluskin, and N. Sereno to discuss support of a FO-based BLM for SCU1. (Jeff Dooling)
- Sereno and Gluskin agreed to split the cost and fund the BLM up to 5 k\$ total. (Jeff Dooling)
- Altered the geometry definition of the modified scraper to include small voxels explicitly in the MARS model. (Jeff Dooling)
- Continued work reproducing Y-C Chae's single bunch current simulations. Presented some of my results/confusion at the MBA physics meeting, where some issues were resolved. (Ryan Lindberg)
- Built on the resistive wall contribution using (slightly) more sophisticated formulas for elliptical chambers. The difference is not too great. (Ryan Lindberg)

Linac Research and Development

- Visited 400A to inspect linac injection mirror assembly and support. Discussed injection mirror cube support with engineer J. Morgan (NE). (Jeff Dooling)

- Finalized the beam line layout for PC gun installation at the front end of the linac. Worked with mechanical designers on the installation and alignment tolerance for the quadrupoles, gun and solenoid. Reported the physics requirement to the mechanics design review committee. Discussed with vacuum group on a procedure to improve and maintain 10-10 Torr vacuum of the PC gun during the move from ITS to the linac. Suggested to remove the RGA from the cathode viewing port and install a cold cathode gauge. (Yin-e Sun)
- Coordinated transportation, installation and wiring to AC sources of two new power supply racks in the Klystron Gallery. This effort is in support of the new PCGun. (Stan Pasky)

ITS Research and Development

- Continued with PCGun commissioning. Working with Y. Sun, measured energy of the beam at relatively low gradient, where beam energy would be low enough to keep bend magnet current in measured range. (PC Gun energy is significantly higher than the thermionic guns that have previously been installed in the ITS.). (Jeff Dooling)
- Attended PIP meeting and presented results from earlier QE map study; suggestion was made to compare contour plots using raw data with results from sddsinterpolate. (Jeff Dooling)
- Completed photo-cathode RF gun electron beam measurements. (Yin-e Sun)
- took systematic measurement of the electron beam emittance at different rf gradient, phase and bunch charge. Optimal operation conditions for low charge (20 pC) and high charge (80-100pC) are established. (Yin-e Sun)
- Took systematic measurement of the beam energy and energy spread at various rf gradient and phase. (Yin-e Sun)
- Measured the dispersion at the spectrometer location using two different methods: (1) vary gun gradient (beam energy) and keep the spectrometer current fixed; (2) vary the spectrometer current and keep the beam energy fixed. The experimental results are compared with theoretical calculations. (Yin-e Sun)
- Took QE and dark current measurements. QE varies between 2-4e-5 depending on the rf gradient and phase etc. Maximum dark current measured from the ICT is less than 100pC (at 11MW rf forward power to the gun) (Yin-e Sun)
- Requested the survey of ITS beamline before the PC gun is taken out. (Yin-e Sun)

Other Research and Development

- Completed laser FEL simulations for possible inclusion in LEUTL tunnel. Presented the discouraging results to collaborators at U Wisconsin. (Ryan Lindberg)

APS Machine Software

Storage Ring

- added "Xray Grid" BPM type to SR BPM status management tool, and added "OkForGapScan" field for SR BPMs, so that we can filter the xrays bps that are not suitable for gap scans. (Hairong Shang)
- replaced S35BMBL2 prefix by S35BM in bpMonStartup and SRBPDSSetup (SR bunch purity cleaning) due to pv name changes (Hairong Shang)
- added filter of ID 27 and 35 xray bps for set xray blades in SR mobo gap scan application because they are being included in sectors.sdds file now, can not use this config file to remove

them. (Hairong Shang)

Injectors

- wrote code for booster BM IRamp gain and delay computation, different from others, the BM delay was obtained from linear fit of measurement and reference current waveform. since current correlation method does not work for BM, will test this linear fit method for BM bcontrol. (Hairong Shang)
- added set the IRamp trigger offset to zero after generating new IRamp reference in BRampControlAutoCorrection. (Hairong Shang)
- added switching booster injection tune controllaw to switch to IRamp/VRamp in switching IRamp/VRamp PEM, and added SCR selection to restore the IRamp trigger delay offsets when switching to IRamp. (Hairong Shang)

General

- wrote sddsmatrix2column for transferring a matrix (SDDS file) into one column in row or column major order. (Hairong Shang)
- continue working on complex pseudoinverse. (Hairong Shang)

Web Site

- Maintain Next-Generation Storage Ring Meetings wiki web site. (Yipeng Sun)

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

- Reviewed one paper for PRST-AB. (Yipeng Sun)
- Attended PV gateway presentation by Marty Smith (Karen Schroeder)
- Attended shutdown planning meeting (Karen Schroeder)
- Attended 2014-7- Tcavity/PC Gun meeting(s)... PCGUN operation and installation effort. (Stan Pasky)
- Reviewed LDRD proposal. (Ryan Lindberg)

Safety and Required Training

- ESH114 training. (Yipeng Sun)
- took ESH114PR. (Yin-e Sun)