

Weekly Report for 03/02/2015

APS Renewal and Upgrade

- Worked on simulation of orbit motion amplification factors as a function of ground motion correlation length. Found that for correlation length above 2 sectors for X and 1 sector for Y there is no amplification at all. Need to understand the results. (Vadim Sajaev)
- Continued working on including lifetime calculations in the simulation of commissioning. Initially, found that for many error seeds the existence of closed orbit does not guarantee any reasonable lifetime. Working on algorithm for achieving a reasonable lifetime to allow for orbit correction to proceed. (Vadim Sajaev)
- Read PRSTAB 17, 064401 on HHC issues. Calculated rf bucket for MBA with HHC. Written a tech note on injected beam longitudinal mismatch. (Aimin Xiao)

MCR Operations

Storage Ring Operations

- Set up hybrid lattice with newly optimized sextupoles. The sextupoles were optimized by M. Borland to improve dynamic aperture in the presence of smaller gap of ID4 chamber. The sextupoles are significantly different from what we had before. (Vadim Sajaev)
- Together with A. Xiao, measured effect of CPU on the dynamic aperture. We found that different correction tables affect dynamic aperture significantly and differently. Later, A. Xiao reported that this strong effect of CPU on DA was gone. The reason is unknown. (Vadim Sajaev)
- Coordinated the evaluation of the effect of the reduced gap of SCU1 chamber on the beam (MD group reported that during construction, the gap reduced from 7.2mm to 6.7mm). Several group members investigated different aspects of this gap reduction. Wrote final summary that allowed to proceed with installation of the reduced-gap chamber. (Vadim Sajaev)

Linac Operations

- Discovered coolant water from the pc gun drive laser chiller was leaking causing a no-flow condition; alerted R. Wright (AES-MOM). (Jeff Dooling)

APS Machine Studies

Storage Ring Studies

- During no-beam study access, recorded images of the RG2FC screen. (Jeff Dooling)
- Conducted RG2 tune up study with Yine Sun and Michael Borland. (Jeff Dooling)
- Conducted RG1 conditioning study with S. Pasky. Gun 3G1 had been installed in RG1 the previous day. (Jeff Dooling)
- The gun cathode required approximately 30 W of heater power to activate. (Jeff Dooling)
- Measured local impedance of ID4 and compared it with the impedance measured last run before installation of the new ID4 chamber. Found that ID4 chamber has about 20% impedance that last run. It was supposed to be lower by about 20%. This supports the observation of the reduced ID4 aperture. Wrote tech note describing the measurements. (Vadim Sajaev)
- Worked with Vadim on DA measurement with/without CPU running. The DA reduction with CPU running is much stronger than previous measurement. (Aimin Xiao)
- Performed orbit switch from 24 to Hybrid. Optimized tune with gap closed and CPU running for a better injection efficiency. (Aimin Xiao)

APS Machine Research and Development

Storage Ring Research and Development

- Worked on SR thin-septum geometry in MARS. (Jeff Dooling)

ITS Research and Development

- Along with Yine Sun, met with Sergey Antipov of Euclid to discuss a possible THz experiment in the ITS. (Jeff Dooling)
- Challenge is to focus the rf thermionic gun beam through the small aperture of the radiator with relatively large transverse emittance. (Jeff Dooling)

APS Machine Software

Storage Ring

- added turn off the tune switches to getxytunes at the end to avoid RF leakage. An excitation was found after measuring SR tunes during user operation, the vertical emittance increased until the switch was turned off. (Hairong Shang)
- Improve SR tune measurement (APSMMeasureTunes): 1) added fill pattern selection for user to choose and update the SR colby delay for selected pattern for NASA tune measurement 2) added measuring tune with MXA/VSA. ready for test. (Hairong Shang)
- did 4x4 feedback matrix study with Shifu and Nick. RTFB feedback could not be restored after study, got heart-beat error. Shifu found that the sample rate was not restored after IOC reboot. Therefore, added RTFB sample rate to SR SCR (SR.req.set1) as readable for comparison to help user find the problem quicker. (Hairong Shang)
- helped Karen with gap scan problems due to hardware failure, help her restore the blade offset and rate after gap scan failed. (Hairong Shang)

Injectors

- improved BRampControlAutoCorrection: changed to abort booster injection controllaw before generating IRamp reference file and added a prompt-dialog to remind user start injection controllaw after IRef is generated, because the QF and QD delay error was set to zero when generating IRef, it adds artificial errors to injection controllaw if using resume and restart feature. (Hairong Shang)
- fixed the problem of parValueList variable in measureLinacEmittance script that it was not defined for systems that do not have parameter pvs, and corrected the pixel units which should be pixels/mm instead of pixels/m. (Hairong Shang)
- removed time shift processing in BIRampWaveformMon because now the injection time is moved to start digitizer, time shift is no longer needed. (Hairong Shang)
- updated the injection time computation in BRampControl due to the hardware changes: the injection time was moved to start-digitizer. (Hairong Shang)

Miscellaneous

- Took half day vacation off. (Aimin Xiao)
- Made machine study schedules. (Aimin Xiao)