

Summary of work done

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Status of PSP projects

Machine	Description	People	Status
Pre-Acc	Improve neutralization in LEBT with N or Xe.	Dan	Installed new turbo in test stand.
Pre-Acc	Laser collimation of head/tail of longitudinal beam. (LDRD)	Dave	In contact with vendor for selection of optical engine.
Pre-Acc/Linac	Simulation of PreAcc + Linac	Valeriy/Kiyomi/ Dan	There are vertical exit angles from both source and RFQ. Dan is working on putting permanent magnets into the source to correct this angle. For RFQ, there is not enough dipole strength, but Valeriy's calculations say that quads should also be able to straighten out the beam.
Pre-Acc/Linac	Checking efficiency with increased current in LEBT corrector	Kiyomi/Dan/Pat	Scan of LEBT correctors were done during study period (23 Jan 2019). To be completed during next study period in February.
Booster	Flat injection porch	Bill/Kiyomi/ George/Howie/ Chris	Flat injection is operational! See Kiyomi's talk. Test stand for measuring delays from eddy currents on the beam pipe which delays and affects the effect of the corrector ramps.
Booster	Adiabatic capture	Chandra/Tan	Phase slip is confirmed during study period. See Chandra's talk.
Booster	2 nd harmonic	Robyn/Tan	Waiting for MI 2 PA test to be completed so that cavity can be moved into cave.
Booster	Wide bore cavities	Salah/Matt	Inner conductor in machine shop to drill holes for stems. Once done, window welding.
Booster	2 stage collimators	Valeriy/ Chandra	Had meeting on 12 Dec 2018 to decide on the length of the primary collimator. Work to see amount of shielding needed for tritium control in sump water.
Booster	Injection girder	Dave	First orbump design to be completed in January. This drives size of D magnets.
Booster	Garnet loss improvements	Robyn/Tan	Got LDRD! (14 Jan 2018). Vendor submitted SBIR with help from us.
Booster	Mode 2 longitudinal damper	Nathan	Requires new broadband cavity. Also need specs. (benefits PIP1+)
LLRF	GMPS machine learning (get rid of reference magnet)	Bill	Got LDRD.
LLRF	Complete DDS upgrade, paraphase controller	Brian/Ed	First pass of model has been done. Analytic solution being studied.
LLRF	Phase feedback	Brian/Ed/Bill/ Tan/Valeri/Craig	Machines studies show problems with phase feedback system. Delay is long: ~4 us. Has to be as fast as possible < 2 us to work properly.

House keeping

Machine	Description	i/c	Comments
Linac	7835	Kiyomi/Tan	M&S budget settled. However FNAL budget is still not finalized!
Linac	Klystron	Kiyomi/Bill/ Tan	L3 still working on proposal. No production until Q4 2020. See email dated 02 Jan 2019.
Booster	BPM	Salah/Peter	Getting closer ... still some timestamp errors that are intermittent. B40 works. Snapshot BPM not working.
Booster	Longitudinal coupled bunch mode dampers	Nathan/Bill	Modes are not damped intermittently. Nathan will modify damper system to allow it to measure open loop response. Capability should be available in mid-Feb. This should allow us to check whether the phases are done correctly or there are other problems in the damper box.

Studies (23 Jan 2019)

- DC ramp studies
 - LLRF – measured open loop frequency response.
 - HLRF – measured phase slip in different RF voltage configurations.
 - IPM calibration
- HEP ramp
 - Linac dipole corrector scan (incomplete)
 - Tested procedure for finding aperture restrictions.
 - Flat injection
 - Includes LLRF change to allow one shots to change RF curve during normal HEP.
- Unplanned study
 - Removing all events the timeline revealed a problem with the HL dual channel track & hole module which samples the bias curve.
 - The tracking module output continuously climbs and causes the bias current to climb too. Eventually tripping the 1600A breakers. (should be at 800mV but climbs to 10V over 40 minutes).