

# Summary of work done

C.Y. Tan  
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# Status of PSP projects

Machine	Description	People	Status
Pre-Acc	Improve neutralization in LEBT with N or Xe.	Kiyomi/Dan/ Pat	More beam to Tank 1
Pre-Acc	Penning source and test stand	Dan/Pat	Test stand is up and running. Normal magnetron installed for test.
Pre-Acc	Laser collimation of head/tail of longitudinal beam. (LDRD)	Dave	New style flange designed for easy install/uninstall. Waiting for quote.
Pre-Acc/Linac	Simulation of PreAcc + Linac	Valeriy/Kiyomi/Dan	Permanent magnets being considered.
Pre-Acc/Linac	Re-aligned RFQ	Kiyomi/Dan/Pat	Realigned during shutdown
Linac	Klystron testing	Kiyomi	KRF8 pulse transformer has been swapped with test station (30 Oct 2019)
Booster	Flat injection porch	Kiyomi/Bill/George/ Howie/Chris	Studies done on 27 Nov with DC ramp.
Booster	Adiabatic capture	Chandra/Tan	Studies done of 26 Nov.
Booster	2 <sup>nd</sup> harmonic	Robyn/Tan	Removed from cave. Getting ready for repair.
Booster	Wide bore cavity	Salah/Matt	In test cave. Low power tests show cavity does not reach extraction frequency at 2500A. Will continue high power tests at injection frequency. Do sims to lower mu of tuners.
Booster	2 stage collimators	Valeriy/Chandra	Have budget code to start drawings.
Booster	Injection girder and injector civil construction to Booster	Dave/Salah/ Tan	PDR on 20 Nov
Booster	Garnet loss improvements	Robyn/Tan/louri/ Gennady	Meeting on 02 Dec. Waiting for mechanical engineer to be assigned.
Booster	Mode 2 longitudinal damper	Nathan	Victor and John did studies on 31 May to characterize mode 2 from cavity signals.
LLRF	GMPS machine learning (get rid of reference magnet)	Bill/Brian/Kiyomi	See today's talk.
LLRF	Complete DDS upgrade, paraphase controller	Brian/Ed	Studies on 25 Nov and 26 Nov. Can make paraphase curve look like analog ones. However, another knob is needed for phase between A and B to get injection to work properly.
LLRF	Phase feedback, radial feedback	Brian/Ed/Bill/Tan/ Valeri/Craig	Expect first test before end of May.

# Task force updates

- Injection girder
  - Talked to Dan Wolf and Howie Pfeffer, we will have to do a SPICE calculation as to whether there will be an “imbalance” (transmission line modes) that will shake the beam because of the addition of 4 D magnets that are not identical to the D magnets in Booster. (30 and 31 Oct 2019)
  - Absorber review (20 Nov 2019) <https://indico.fnal.gov/event/22416/>
- Lattice
  - Method to reduce 1/2 integer proposed.
    - Studies once Booster starts up
    - Work on effect of removing corrector at L11 (see today’s talk)
- Digital LLRF
  - Meeting on 22 Nov
    - Ed will discuss with Bill and Kiyomi about 2<sup>nd</sup> pass of signals required for Booster from PIP-II Linac
- Magnet girder tests
  - Set up at E4R
  - Area needs to be cleaned up.
  - Lead person has been identified for install/cleanup: Fernando Juarez (Mechanical)
- 20 Hz infrastructure
  - First meeting held 19 Sep 2019. Docs on beamdocs. A lot of work!

# Task force updates (cont'd)

- 2 stage collimators
  - Task code has been supplied. Drawings started.
- Tall aperture gradient extraction magnets
  - See injection girder about the problem with GMPS with non-identical D magnets. (today's talk)
  - Calculation for gap size is complete. To be presented on 11 Dec by Valery K. Required for TD to start their calculations.
- 20 Hz cavity tests
  - Report is being written.
- 50 kV in situ cavity test. Required for PIP-II
  - Plan is to test in January after balancer circuit is redone.
- Shielding assessment
  - First meeting held. M. Vincent (Safety) will be leading.
- Tevatron tunnel mods for BTL
  - New lattice means no more rolled dipoles to get above the ceiling.
  - A beam pipe will go straight through the tunnel. Removed when necessary to move magnets.
- BTL to L11 changes
  - Considering different construction method to make the hole for beampipe into Booster (Meeting on 22 Oct). See next slide.