

Lab Status/ AEM Meeting Notes

Monday January 8, 2018

<https://indico.fnal.gov/conferenceDisplay.py?confid=16006>

Safety Incidents: None reported.

Accelerator Operations:

- Dec. 18 -25, 2017
 - MI access for Air leak. MI52 septa vacuum recovery and reconditioning.
 - NUMI: 145 hrs, 1.33E19; BNB: 153.8 hrs, 8.36E18; Muon: 130.8 hrs; MTest: 48.5 hrs, MCent:91.1 hrs
- Dec. 25, 2017 – Jan. 1, 2018
 - NUMI: 154.5 hrs, 1.79E19; BNB: 155.3 hrs, 4.3E18; Muon: 150.2 hrs; MTest: 62.1 hrs; MCent: 104.5 hrs
- Jan. 1 -8, 2018
 - NUMI: 154.1 hrs, 1.78E19; BNB: 118.1 hrs, 3.64E18; Muon: 98.7 hrs; Mtest: 94.6 hrs, MCent: 135.6 hrs
- Linac investigating LR3 MARX trips; KRF3 water leak.
- Booster tuning. MI/RR tuning; MIRF13 modulator replacement.
- NUMI: ~640kW with switchyard. BNB: running at 5Hz; MI12-A ventilation issues.
- Special run Tuesday; NOvA FD down. Accelerator access on Wednesday, Jan. 10 starting at 6 am to work on various problems.
- PIP-II injector studies ongoing. Shutdown 3-4 weeks on Jan. 22nd.
- FAST: 300 MeV commissioning successful; IOTA installation underway.
- CMTS1: LCLS-II F1.3-07 installed and cooled. Tests to begin.

MicroBooNE:

- DAQ stability issues during the holidays due to replacement of a disk that initiated RAID rebuild. Fixed on Jan. 3.
- Now in stable running. POT weighted uptime 97.4% for last week.
- Liquid Ar pump #1 noisy possibly the bearing beginning to fail. Will replace soon.
- Computing -- Job success: 97%; CPU efficiency: 48%; inefficiency due to several factors.

Minerva:

- Minerva live time 92.5%; Minerva with MINOS 90.1%.
- A couple of problems. Dec. 29 – Jan. 1 some files weren't processed by keep-up. DAQ had stopped on Dec. 13 pointing to MASTER card, MINDER card replaced on Dec. 14, which fixed the problem. Not understood.
- Job success rate 80%, CPU efficiency 43%, low due to data calibration overloading DB on Dec. 25 and MC gen eff had been underestimated.

NOvA:

- FD downtime Tuesday day shift to install and test fail-safe temperature-controlled electrical panel breakers for the FD computing room. Elevated temperatures above set threshold will cut power to the computing room.
- Four week DAQ rate average: 99.7% (ND), 99.2% (FD).
- Job success rate 95%; CPU efficiency 79%.

g-2:

- Ran successfully Dec. 21 to Jan 2. Good tests of stability. Four controlled accesses.
- Fixed a collimator problem → got 1.5x stored muons; started kicking in 8 bunches and performed time scans → 1.5x increase.

- Very cold temperatures revealed problems – very small He leak in main magnet cryo. Will identify and mitigate; Temp./Pressure oscillations caused B field oscillations. Calorimeters 24/24 operating, but gain drifts. Tracker signals disappeared as temperatures plummeted.
- Kicker plate distorted, performed access to fix. Quads needed lots of conditioning after vacuum work. Trolley reinstalled and is working.
- Beam tuning continues.
- Plans: Address issues uncovered during holidays – inflector cooling stabilization, tracker gas testing. More iterations on beam, detector and injection tuning.
- Computing 98% job success, 36% CPU efficiency.

PPD Operations:

- CMS
 - Operations: Pixel DCDC converter issue still under investigation, more information with extraction of second half of FPIX detector this week
 - Phase 1 Upgrade: HB and HE Upgrades rolling along - HE installation restarts this week, HB major procurements underway.
 - HL-LHC Upgrade: (1) Successfully passed NSF PDR on Dec. 16. Planning for a pre-CD-1 Director's review the week of April 2, the CD-1 IPR the week of June 4. Workshop at FNAL the end of January to assess project status and plans towards CD-1. (2) Working on defining the scope of deliverables for the MIP Timing Detector. (3) At SiDet, the Precision Metrology group characterized HGCal cover plate and a cooling plate; developing procedure for automatically detecting defects in CMS pixel detectors using a vision inspection system.
- Mu2e
 - Solenoids: PS/DS -- General Atomics VPI'd the model coil in early December, to be delivered in Feb. GA also working on a DS8 pseudo-coil to test long coil insertion. TS -- ASG putting finishing touches on the first TS unit. Expect the first unit to arrive in late January/early Feb.
 - Accelerator: AC Dipole: Still waiting for vacuum ferrites. Need to test these and complete testing the 1m prototype. The 300 kHz test done on the 1m prototype in December showed better performance than expected from the scaled 0.5m prototype. Still need to re-do the 4.5 MHz power test.
 - Tracker: Will start to build a panel with new straws and the new Panel Assembly Alignment Structure (PAAS). Panel inner ring epoxying will start on Monday.
 - Calorimeter: 12 pre-production SICCAS crystals arrived at Fermilab in Dec. Crystals showed some damage from shipment; were vacuum packed and wrapped in bubble wrap for shipment. Discussing improvements to packaging. Besides the problems from the rounded/dinged corners, the crystal dimensions met spec.
- Astro
 - DES: (1) On Jan. 10 the first 3 years of DES data and data products will be released to the Public along with a press release, and detailed information about ~400M detected objects, i.e., ~ 320M galaxies and 80M stars. (2) Also on Jan. 10th presentations on the DES data release and new results at the American Astronomical Society mtg at a special DES Session. Watch for W&C seminars!

- SENSEI: Taking data at NuMI with ~1 g detector and analyzing. Working with LBNL on design of skipperCCD for SENSEI 100g experiment.
- DAMIC-100: Taking data at SNOLAB, analyzing, expect results by UCLA DM mtg.
- CONNIE: Stable operations at the ANGRA-2 reactor in Rio de Janeiro. Getting ready for the Feb-2018 reactor shutdown. Analysis of the Nov-2016 shutdown data ongoing, reprocessing data using new tools completed in December 2017.
- MKID for visible and near IR: Starting tests of the 2 fabrications round at UofC.
- DESI: Successful Director's review Dec. 12-14 in preparation for DOE Annual Status and Operations review Feb. 6-8. Wired and tested a 2nd motor in the middle section of the DESI barrel at SiDet. CCD Detector fab completed. Nonetheless, LBNL would like us fabricate a few more CCDs, with a new agreement.
- SCDMS: (1) Successful Director's review for CD2/3 at SLAC on Dec 4-6. DOE/NSF CD2/3 review at SLAC on Jan 24-26. DOE/NSF operations review in April or May. (2) First infrastructure items installed at SNOLAB in January. SuperCDMS fabrication/testing in Lab G in 2018. SNOLAB install in 2019 and operations 2020.
- SPT: Brad Benson and Adam Anderson at the South Pole since mid November to upgrade the SPT3G focal plane. Dec 12-16: Installed complete focal plane and lens set (config. for 2018 season). Dec 16-24: Successful pump and cryo cool-down. Dec 25-Jan 2: Completed On-ground tests: hardware map, yield, noise measurements. Jan 3: Installed SPT-3G on telescope. First light in the next few days!!
- LZ: DOE Status and Operations Review taking place Jan 9-11 at LBL.
- Test Beam: Current users at MTEST (T1409: CMS Timing) had a very successful run and are finishing up on Jan 9. Next installation (T1396: Hadron production with emulsion targets) starts Jan 10, and will be in place for 2 weeks. PixLAr had a very successful run and is looking to wrap up with about two and a half more weeks of data
- Electrical Engineering
 - Paper Published: An Algorithm of an X-ray Hit Allocation to a Single Pixel in a Cluster and Its Test-Circuit Implementation, Gregory W. Deptuch; Farah Fahim; Paweł Gryboś; Jim Hoff; Scott Holm; Piotr Maj; David Peter Siddons; Piotr Kmon; Marcel Trimpl; Tom Zimmerman, IEEE Transactions on Circuits and Systems I: Regular Papers, Vol. 65, Issue 1 (2018) 185-197.
 - Legal issues related to accessing fabrication technologies for submission to the CERN/IMEC foundries services encountered. The ASIC group's productivity severely limited by the difficulty in getting proper legal agreements signed. This and the RD53 collaboration agreement are both outstanding issues. Help with dealing with the legal issues requested.
 - The next generation ATCA Pulsar board (Pulsar3a) submitted for PCB fabrication; assembly planned for February. New design uses the latest Xilinx UltraScale FPGAs; will test serial transceiver performance at speeds up to 16gbps (copper ATCA backplane) and 25Gbps (fiber).

- Tevatron: (1) X(5568) tetraquark search papers submissions by both CDF and DZero during last week of 2017 - working on understanding the differences. (2) CDF/DZero $\sin^2\theta$ most accurate hadron collider combination to be submitted for publication.
- Other: Dmitri Denisov elected member-at-large by APS Forum on International Physics.

ND Operations:

- SBN:
 - Approval process for the duty free status for import of ICARUS is in progress. If there are no objections within twenty business days the application will be approved. However, processing of an approval letter may still take some time.
 - The US wire winding facility at Yale for the SBND APA frames has been set up. Work paused at both Daresbury and Yale over the recent holidays.
 - A container of components for ICARUS installation departed CERN on Dec 22 with expected delivery to Fermilab by the beginning of February.
 - Components of the ICARUS cold shields are nearing completion in Spain, Israel and Turkey. Delivery to Fermilab expected in February. The ND LAr cryogenics team has started work on engineering notes for this system.
- DUNE/protoDUNE:
 - Work starting up again at CERN following holiday break.
 - APA#2 to be tested in cold box. APA#3 (UK#1) due to arrive Jan. 15; photon detectors to arrive Jan. 9 for installation starting Jan. 17; cold electronics installation will follow. APA#4 (PSL#3) getting ready to wind last plane.
- DUNE Management:
 - Preparations underway for the next DOE review in March 2018.
 - DUNE-US continues to evaluate its risks as a follow-up to the LBNF/DUNE Risk Workshop in December.
 - The UK APA #1 is due to be shipped to CERN on 12 January. The Project support sub-team of the Host Lab Working Group met last week to review its assigned issues, evaluate priorities and consider actions and key contacts.
 - Charge for the IPR, 20-22 March 2018, is still in final development.
- DUNE Science:
 - Near Infrared test in LAr: Working on the NIR paper for the LIDINE 2017 proceedings. Making changes on the NIR DAQ.
 - LArIAT continues analysis of hadron cross sections with data from Run-I and Run-II. The detector paper is expected to begin full collaboration review soon, with a goal of submitting to JINST by March 1.

LBNF Project:

- No report.

TD Operations:

- HL- LHC, AUP – Producing coils: QXFA107 is in the impregnation stage. QXFA108 outer layer winding is complete, coil being cured. Short coil QXFS09 impregnated last week.
- LCLS II – tests of quads continues, SPQA121: test completed before Xmas, SPQ122 prepared for cooldown. Quads 123-124 in different stage of incoming inspection.
- Mu2e : (1) TS first production module fabrication underway. Work in progress with PS/DS model coil at GA. Post-impregnation machining to be performed by January 8th. Next steps are coil insertion in shell, then LN2 testing. To be discussed January 10th.

(2) TS prototype at HAB warmed up. Depending on schedule for the first production module, prototype will be dismantled and sent to IB2 for stretched wire measurements.

- AS – Final assembly of two CDAs for Mu2e is complete and the magnets will be sent to MTF for measurements; measuring IDV trim dipoles for MI and Recycler.
- G-2 - R&D activity resumed on the g-2 Inflector
- MDP 15-17 T dipole R&D : Good progress being made. Also preparing for MDP collaboration meeting.
- Infrastructure (IB1) – Major progress on network upgrade cabling installation; Install Klystron for SRF R&D in VTS3.
- SRF Sector :
 - R&D : (1) Several 1-cell cavities and three 9-cell cavities were tested since last report. (2) Continue to get statistics with various recipe of N-infusion. (3) Two Nb3Sn coated. Test in progress. (4) Nb/Cu equipment relocated to new location, installation is in progress. (5) Quantum computing cavities BCP is in progress.
- LCLS-II
 - 1.3 GHz cavities -- Two more cavities qualified. One full scale re-test CAV0103 showed interesting result about expulsion efficiency of NX material that helps to understand CM06 cryomodule performance.
 - For 3.9, 3HRI02 dressed, waiting for test prep. 3HRI03 HTS is in progress. Tuner/piezo test is in progress.
- CM0n cavities (n=3, ... 11) in various stages of processing.
- PIP-II: Spoke cavity S113 test in STC is in progress

Computing Operations:

CCD:

- No issues. All going well.

SCD:

- Good week.
- App areas will be unmounted from worker nodes on 1/18/2018 to get ready for HEPCloud production.
- Working with uboone team to improve CPU efficiency. Significant improvements by streaming transfers (xrootd) instead of gridftp.

Office of Communication:

- Energy Secretary Perry will visit the Lab on Tuesday, Jan. 9th. All hands meeting with Secretary's address.
- Pechakucha event in Batavia being planned.

Directorate:

- No report.