MicroBooNE Status Report

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Fermilab

AEM Meeting
11th September 2017

MicroBooNE's shutdown operations

- Status at last AEM meeting (August 7th):
  - Cryogenics maintenance almost over, aiming to a metastable state
  - DAQ bottlenecks identified
  - moving towards the second phase of the shutdown operation plan

- Operation plans for last month:
  - LAr purity studies
  - PMT HV power supply replacement
  - Zig-zag noise investigation (last source of unexplained noise in the detector)

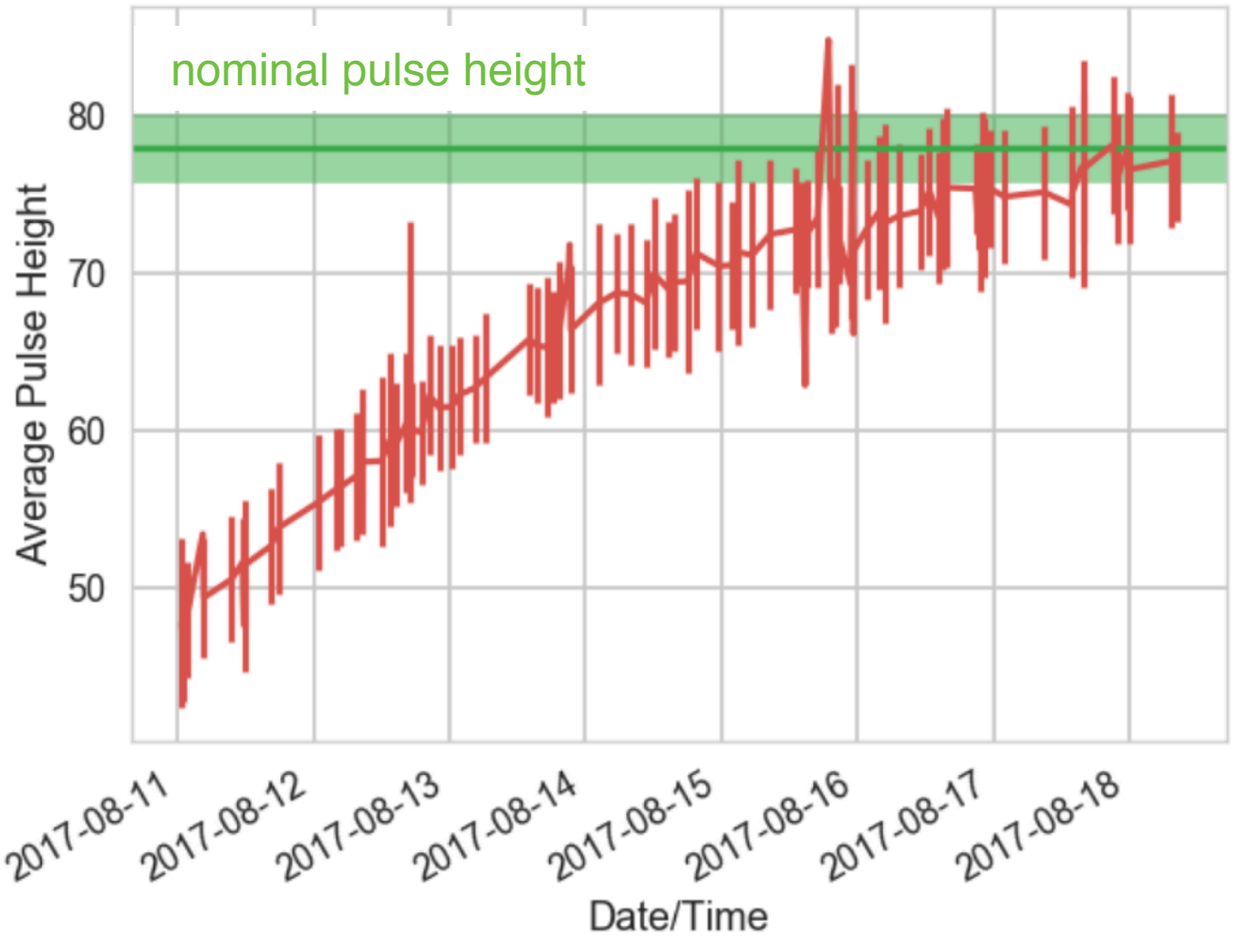
- Next steps:
  - "Late light" studies (investigations on the single photon rate)
  - ~3 weeks worth of off-beam data before the beam comes online

Cryogenics and purity recovery

- **Cryogenics maintenance** was **over** at the beginning of August
- Cryogenics was brought back to its **pre-shutdown state**
  - it was not possible to go back to pre- May power outage stability
  - our monitoring tools can identify small residual pressure instabilities and warn us

- As expected, low LAr purity after cryogenics maintenance
  - Electron lifetime ~2.2ms (nominal: 20ms), O_2 equivalent concentration of 136ppt (nominal: 15ppt)
  - **Successful recovery of nominal purity in ~1 week** time scale
  - Very interesting data to improve space charge and electron lifetime analyses

Credit: K. Wierman



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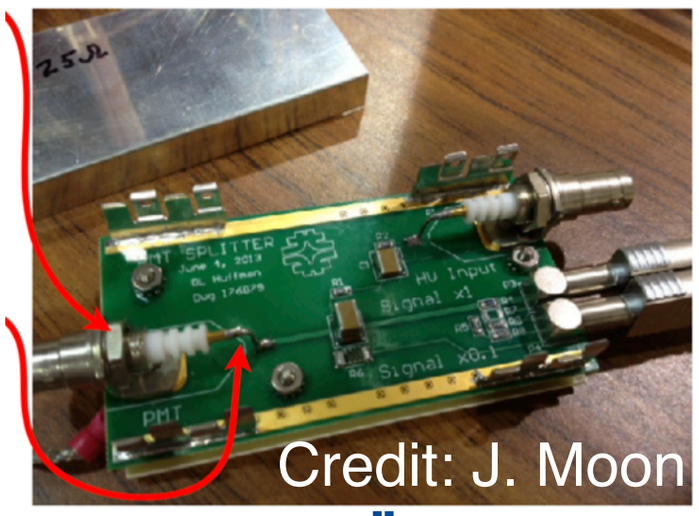
News

- Towards the end of August, our ZMON **impedance monitor** started reporting **intermittent shorts** between the detector and building grounds (has happened in the past)
  - following up with L. Bagby, C. Joe and M. Matulik. M. Matulik is checking whether the impedance monitor itself has problems
- **New Wiener PMT HV power supply** installed (M. Matulik): successful commissioning and operation
- Unfortunately, a faulty connection (loose nut) on a SHV connector on the splitter chassis caused the **loss of a PMT**. M. Matulik modified the system to prevent similar occurrences on the other (31) functioning PMTs.
  - We are assessing the impact on our trigger
- A **Run Coordinator workshop** was held on last August 15th
  - great opportunity to get feedback from previous MicroBooNE's RunCo's

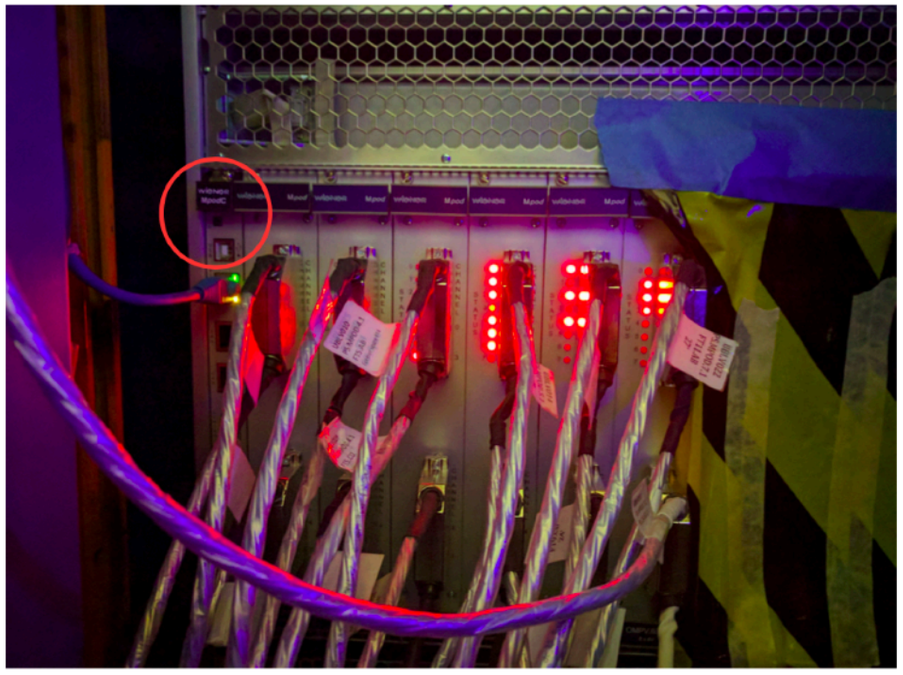


News

- In August, it was discovered that some of the hinges and **locks** of one of the two laser boxes **were missing** during a routine walk-through
  - We are working with ESH&Q (A. Aparicio, M. Quinn, and D. Baird) to secure best the laser boxes moving forward

- Last week, we **lost communication** with one of the power supplies that provides low voltage to the ASICs on our front-end electronics.
  - This issue was later traced to a known to a firmware bug of the controller
  - It will be fixed with a firmware update

Credit: J. Raaf



Summary

- **Cryogenics** maintenance was over and reached a **metastable state**
- **LAr purity was recovered** and precious data was acquired during purification
- A few hardware troubles throughout the summer were addressed (grounding shortage, 1 PMT loss)
- MicroBooNE staffs 24/7 shifts throughout the summer shutdown
- ~3weeks of off-beam data taking planned for the end of the shutdown
- **MicroBooNE is on a good track to be ready for the beam!**