

M0: half-way there

APC - 20/06/2024

Updates on progress

- PDS test stand perfect progression (Dante):
 - all modules except C3 and C7 (FBK) tested (without mechanical retrofitting)
 - Data is here: /eos/experiment/neutplatform/protodune/experiments/ColdBoxVD/M0/June24
 - Henrique analysed it, results are [here](#)
- Module re-fitting:
 - Replacement of 4 WLS (in hand) and mechanical fixes to prevent bending of WLS
 - Zach arrived on Wednesday and got right to work, 2 modules done
 - **Plan to dismount coldbox modules to extract HPK flexes (from coldbox modules C2 and C3) to use in C3 and C7 (if no further objections, after discussion...)**
 - **Could also use the 2 WLS from coldbox C2 and C3 (more arriving end of June)**
- Glass substrates:
 - 70 on their way to CERN from Campinas (arriving on Monday, please provide information on coating runs!!) to be used for 2 cathode modules
 - Needed 64 extra for M5, M6, M7, M8
 - quartz windows?
- Need to verify post-TCO closure installation possibilities and procedure for membrane modules

Configurations / test stand results

- More comprehensive info [here](#)

| Module | WLS | Filters | SiPM | SPE amp | SNR | comments |
|--------|------------------------------------|------------------------------|-----------------------------|---------|-----|--|
| C1 | No dimples | ZAOT | HPK | 2.1/1.7 | 7/5 | Just mechanical adjustments |
| C2 | No dimples | ZAOT | HPK | | | Just mechanical adjustments |
| C3 | No dimples | PE→ ZAOT | FBK→ HPK | | | Proposal: use HPK SiPMs and ZAOT filters from C5 |
| C4 | w/dimples → new | PE→ glass | HPK | 2.1/1.7 | 8/6 | Replace WLS (today) and use glass substrates |

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| | WLS | Filters | SiPM | SPE amp | SNR | comments |
|----|------------------------------------|---------------------------------|------------------------------|-----------|-------|--|
| C5 | w/dimples → new | ZAOT → glass | HPK | 1.3/2 | 5/7.5 | Replace WLS (tomorrow) and use glass substrates |
| C6 | w/dimples → new | ZAOT | HPK | 3.1 / 2.1 | 8/8 | WLS replacement done. Oscillations seen. |
| C7 | w/dimples → new | ZAOT | FBK → HPK | | | Proposal: use HPK SiPMs. Replace WLS if arrival in time (unlikely) |
| C8 | w/dimples | ZAOT | HPK | 9.9 / 7.3 | 8/5 | WLS replacement done |

Plan:

- C3 and C7:
 - perform replacement of flexes -> Zach
 - test next week -> Dante and Renan
- Module refurbishment advances at 1/day rate (19-21,24-28)-> Zach
- Preparation of "re-installation and testing procedure document" -> Francesco and Dave W
 - module installation order?
 - safety?
 - warm testing of cathode and membrane modules
- Re-installation starting ~24 (Jay + Diana)

Plan:

- Prepare PoF rack
 - rack available in r254 of NP02. Need to see with Filippo to move it
 - after this we can operate lasers
- Installation of fibers in pipes
 - better do it before the check of fibers, since the installation itself could damage them? (from Manuel)
- Fiber work:
 - SoF fiber check (cleaning, power measurement)
 - 100% check that correct fibers are connected?
- Light shield installation -> installation procedure?

Plan

- I usually need a list

Removal of FBK SiPMs from cathode - explained

- SoF/PoF electronics developed for HPK @5V ov → larger signals
- FBK and 32V (3V ov) has a much smaller signal (1.5 ADC vs 6 ADC)
 - first seen last month, these SiPMs had never been tested with cathode electronics
→ cold electronics need more gain
- Complicated to adapt electronics now, and will not undergo thorough testing
- But: PDE measurement done with FBK on double sided modules → would be better to have a comparison in M0
- 2 modules with available HPK flexes
- The removed FBK flexes can be used in lab and coldbox to develop adapted readout