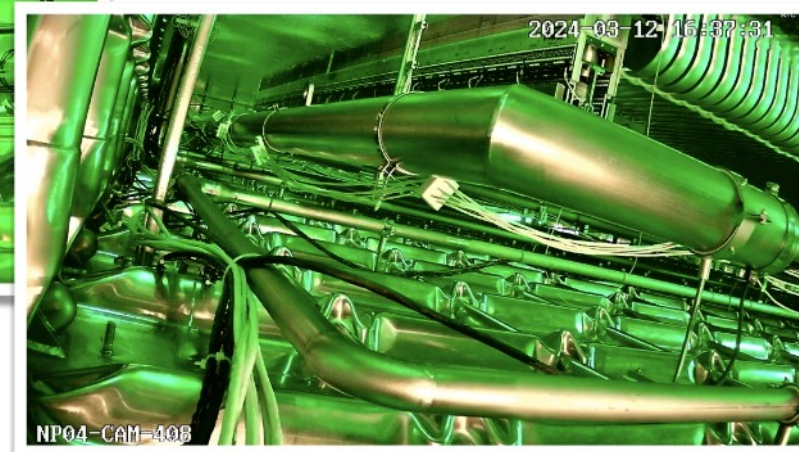
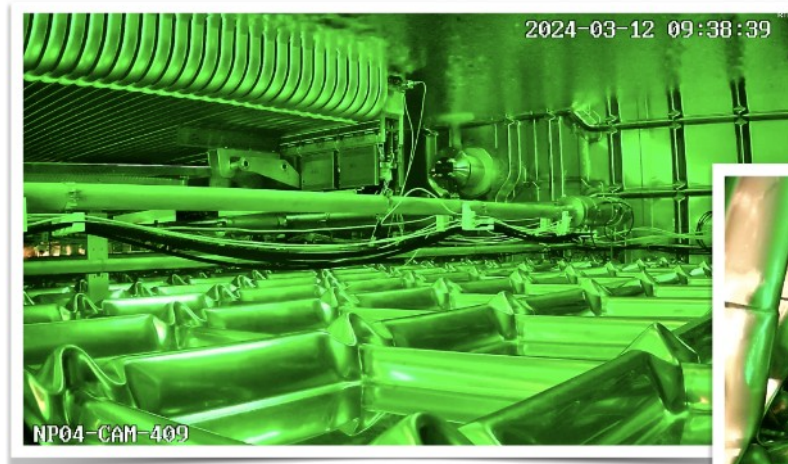


APA Plans: ProtoDUNE-II & Cold Testing

ProtoDUNE-II Plans

NP04 Status

Cryostat will be full by end of April. In almost any eventuality, commissioning the APAs will be next on the docket.



Provisional Commissioning Plan

- 1) Pre-ramp CE noise characterisation.
 - 2) Standalone wire bias ramp
 - 3) CPA ramp
 - 4) Post-ramp stability + performance tests.
- All hand-in-hand with the CE group.

Bias Ramp

Working to ProtoDUNE-I values:

- G: -665 V
- U: -370 V
- V: 0 V
- X: +820 V

Should take only a couple of hours to ramp. Tested standalone first to diagnose any problems independently to the HV.

CPA Ramp

Target Voltage	Ramp Rate	ProtoDUNE-I Wait Time
50 kV	60 V/s	30 mins
90 kV	30 V/s	30 mins
120 kV	30 V/s	Overnight
140 kV	30 V/s	4 hours
160 kV	30 V/s	4 hours
170 kV	30 V/s	4 hours
180 kV	30 V/s	

- Over each break:
- Take dedicated CE noise runs
 - Check for new disconnected channels
 - Check that all CE current draws are stable.

Stability & Performance

- Purity – we should see cosmic visibility improve over time.
- Channel mapping – we should establish our channel mapping is correct through cosmic & laser track measurements.
- Noise – we should make long-term characterisations of the noise in the stable operating state.
- Induction plane transparency – we should observe how uniform the wire response is as a function of position.
- E-field mapping – we should look for distortions of straight tracks that show areas where the E-field is non-uniform.

Logistics

- I will be present at CERN from the 29th of April to the 11th of May (at minimum).
- Aim to see ramp completed and stability/performance monitoring routine established, in close coordination with CE and DAQ.
- Once we are in a stable operation regime, switch to periodic visits and remote on-call support.
- Also use this time as an opportunity to lay groundwork for cold tests.

Cold Testing Plans

Beam Schedule

- NP04 has been allocated much more beam time than we (the cold test team) expected at the end of last year: calendar weeks 25 (10th to 16th of June) and 28-33 (8th July to the 18th August).
- We can't cold test in the NP04 clean room while the beam is on!



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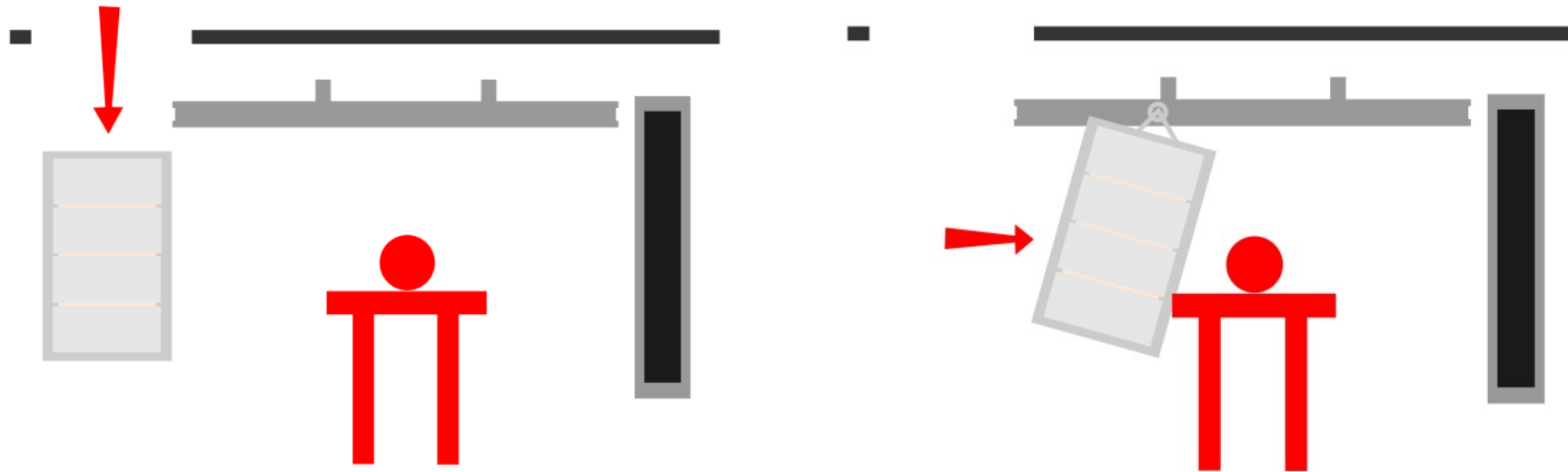


(we also have limited ability to work during active cryo operations, e.g. LAr being filled and emptied from the cryostat)

Pip Hamilton

Preparing the Space

While the beam platform is in place, we cannot use the NP04 clean room as we could before: the path of the APA from entry point to cold box is obstructed.



We need to identify a schedule window and person power to modify the clean room so we can insert APAs on the same side as the cold box.

Preparing the APAs

- Cold test attempts at CERN last year were interrupted & eventually aborted due to QA/QC problems with the APAs.
- These APAs had arrived in a hurry and with light QA documentation (partial QA checklists, travellers which shouldn't be found).
- We need to ensure that this is not repeated. If the beam schedule is forcing us to wait, we should use the time to ensure
 - That we know which APAs are going out for testing.
 - That we are happy that these are representative APAs.
 - That every QA test has been performed and recorded.
 - That those records can be produced.

We should be sure of these points **well before** the APAs are shipped to CERN.

Planning meeting at Daresbury in May?

Preparing the DWA

- We will use the DWA more lightly in future testing cycles than we did last year (2 sets of measurements rather than 3 per APA), but DWA measurements will still be critical path.
- The individual units we will use need to undergo electrical inspection at CERN.
 - We must ensure we have at least two units ready and approved for use.
 - Redundancy in case one fails.
 - Ability to parallelise measurements (with sufficient person-power).
 - We also need a supply of spare parts (e.g. flex cables and connectors) to be able to recover swiftly from any minor faults/accidents.
- We need to understand well how long it takes to make a complete APA tension measurement with the new DWA design.
 - **Another item for a visit to Daresbury?**

Preparing the Personnel

- We need a sustained commitment of time from trained system experts:
 - DWA
 - Boards
 - Support from CE group.
 - A single cold test cycle (testing a pair of APAs) is ~9 weeks, containing:
 - 2 weeks' DWA testing.
 - 2 weeks' CR/CE board installation.
 - 2 weeks' cold running.
 - **Sustained expert manipulations of the APAs.**
 - We have to perform 7 cold test cycles.
 - ⇒ allowing for 2 weeks' downtime between each test, we are requiring at least 2 weeks' expert support for each of these activities, every 11 weeks, for **1.5 years**.
 - The expert pool for some of these systems is already only 1 or 2 people.
- ⇒ **this is a vitally useful area for more contributions.**

Thank You