PROTODUNE-II Status, Planning

Laura Zambelli June 5th 2024 DUNE-France workshop #3, LAPP

ProtoDUNE-HD

2024 February March April May June July September October November December January August January 2425262728293031 3233343536 15 16 17 18 19 20 21 22 23 2 373839 11 12 13 TCO closure Completion of the detector & cleaning Purge Cooldown and fill Purification Detector commissioning **NP04** Nominal operation Beam Stress tests Empty Evaporation and warmup APA test in NP04 cold box

-> Detector fully filled on April 30th



-> -180 kV on the cathode reached on May 10th

<u>Filippo Resnati</u>

ProtoDUNE-HD : purity

As of last week, purity is \geq 4ms measured by the three Purity Monitors (NB : said to be at 10ms yesterday)

<u>Wenjie Wu</u>



ProtoDUNE-HD: PDS



Measurement of the light slow component :

PDS group

- with time (at no drift field)
 - \hookrightarrow sensitive to the impurities
- with the drift field

→ see a reduction of τ_{slow} with E_{drift} as first observed first in the dual-phase demonstrator

 \hookrightarrow Modification of the fast/slow proportion with E_{drift} ; also seen in the dual-phase demonstrator

Calibrations ongoing

Updates from laser team

ProtoDUNE-HD : laser



Run 26574, Trigger 4, APA2 Plane 2

On June 1st, first laser-induced tracks was recorded !



ProtoDUNE-HD: APA-1



Bais to the APA-1 W collection view does not work

- -> W plane is floating
- -> cannot be fixed
- -> Electrons are mostly collected on V view
- -> APA1 is considered as a 2-view detector









ProtoDUNE-HD : Beam

Reconstruction & Identification Efficiencies for 1 GeV/c beam retuned



~80% efficiency when 3view detector -> As one plane is missing, these efficiencies needs to be re-computed with new Pandora algorithms



Open question: how to fine-tune the beam to reach the Δ resonance peak in the cross section analysis ?

-> In ProtoDUNE-SP, only one APA was not enough to reach the 100 MeV peak

ProtoDUNE-HD : Beam



CERN Beam Schedule

Mid June: Beamline commissioning

-> Will help to understand what data we can ask and use given APA1

July ~ August : 7 weeks of data

- -> We originally asked for
 - ± 1 GeV/c data : pion/proton inclusive and exclusive (differential) cross sections
 - ± 5 GeV/c data : kaon inclusive cross section
 - Beam momentum scan : electron/positron energy resolution

ProtoDUNE-HD : blips

Since May 20th, the DAQ is commissioning it's self trigger algorithm -> In particular, to record long tracks crossing the entire drift volume(s) The algorithm searches for hits in continuous wires

Only anomalous blips-like events are recorded

- -> All wires of all APAs sees a discharge-like blip simultaneously
- -> Rate of about 1Hz of blip
- -> Currently there is no explanation as to where it comes from and how to fix the issue
 - All subsystems was switch on/off (PDS, laser, heater, camera, APA bais, FC bais ...) had no effect

Powered by DUNE-DAC

- Only switching off the HV on the cathode stopped the blips



ProtoDUNE-VD

<u>Filippo Resnati</u>

		2024												
		January	February	March	April	May	June	July	August	September	October	November	December	January
		1 2 3 4 5	6 7 8 9	10 11 12 13 14	15 16 17 18	1920212223	24252627	28293031	3233343536	637383940	41 42 43 44	45 46 47 48	49 50 51 52	1 2 3 4 5
	TPC completion													
	Preparation for TCO closure													
	TCO closure													
	Completion of the detector & cleaning													
NP02	Purge													
	Cooldown and fill													
	Purification													
	Detector commissioning													
	Nominal operation													

Important dates

- Field cage open until early July for ×-ARAPUCAs upgrade
- TCO closure starts on August 12th for 3-4 weeks
- Beam plug installation ongoing
- -> Filling should start mid-october for 6 weeks
- -> Data/commissioning starts early November!

CRP6 IV run : CERN Coldbox run in June 2024 About ~2 days of data, no stringent requirement on LAr purity To test : New BDE FEMB and new edge card connectivity

CRP7 : Cold bath test in Grenoble factory Constructed with the same anodes as CRP6 (with hole alignment issue)

CRP8 : CERN Coldbox run in September New PCBs from two companies to be tested to verify the CRP transparency

Useful links

ProtoDUNE physics coordinator: <u>Christos Touramanis</u> NP04 Coordination mailing list: register to CENF-NP04-II <u>through your CERN Account</u> Meeting every Tuesday at 3pm : <u>indico page (usual DUNE password)</u>

Elog for NP04 <u>here</u> - NP02 <u>here</u>

Non-beam data taking: only during working hours <u>Light shift schedule</u> During beam: will be announced later

Slow control App: <u>NP04</u>, <u>NP02</u>

On the spot informations from the control room -> Follow #np04-shifterassistant slack channel

Get involved with the analysis :

- -> DRA contact <u>me</u>, <u>Leigh</u> and <u>Wenqiang</u>
- -> Calibration: contact <u>Rhiannon</u> and <u>Mike</u>
- -> Offline coordination: contact <u>Jake</u>

Links of useful links: <u>DAQ twiki</u>