

# PROTODUNE-II

## STATUS, PLANNING

*Laura Zambelli*

*June 5th 2024*

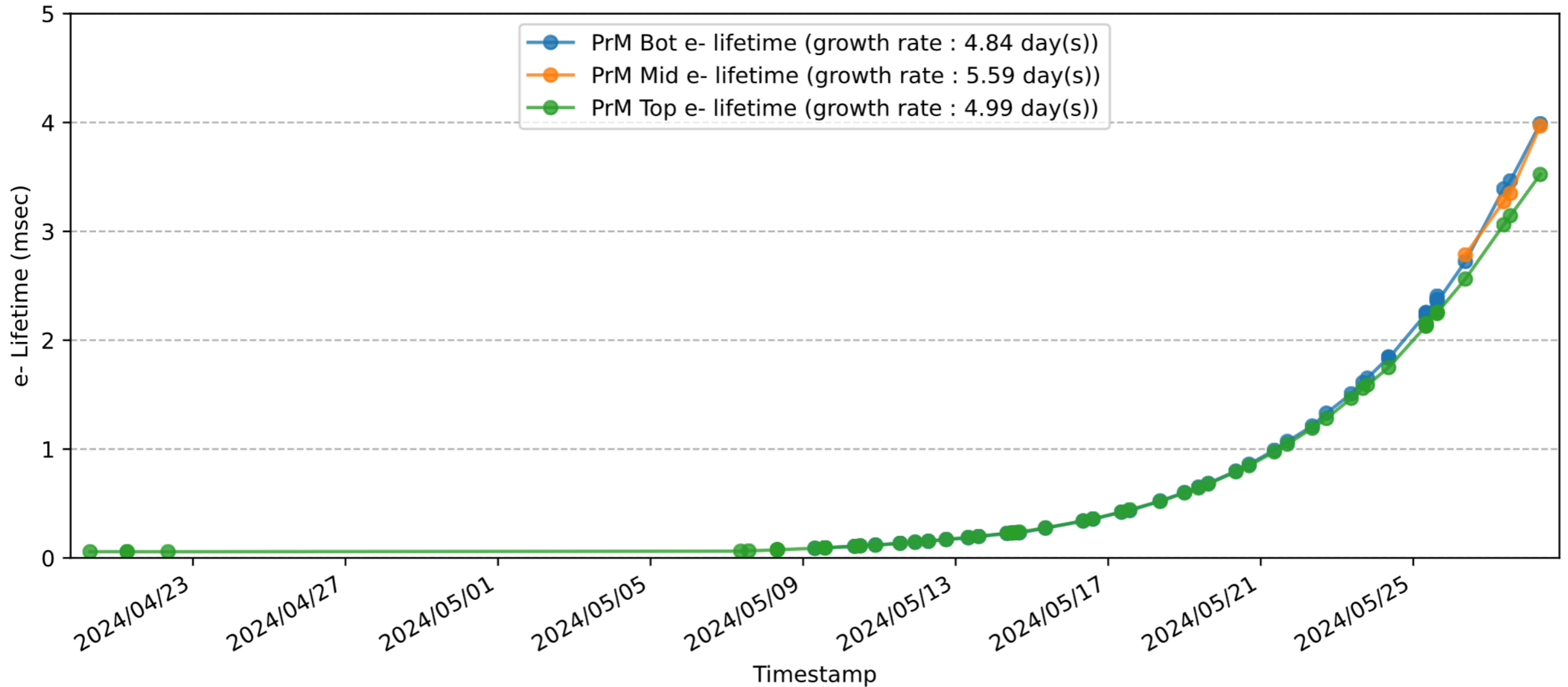
*DUNE-France workshop #3, LAPP*

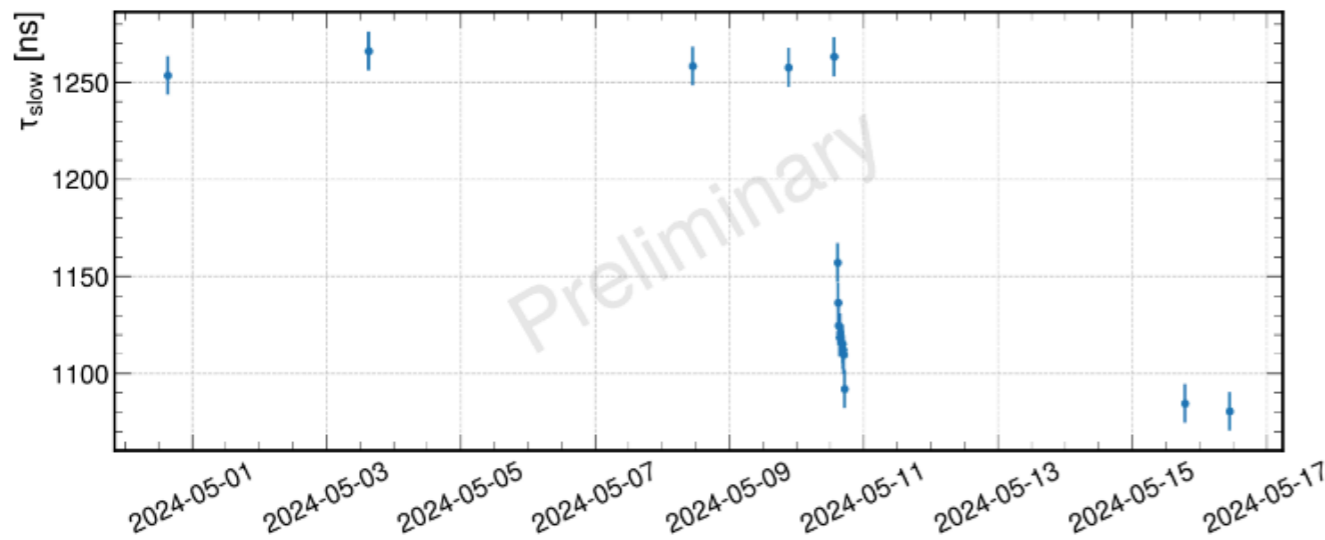


# ProtoDUNE-HD : purity

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

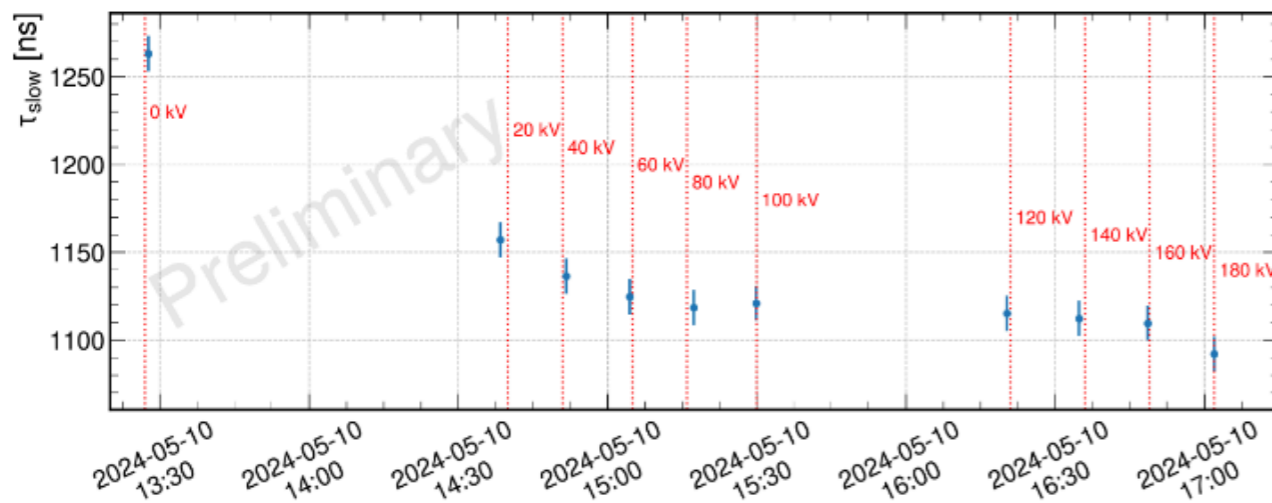
Wenjie Wu



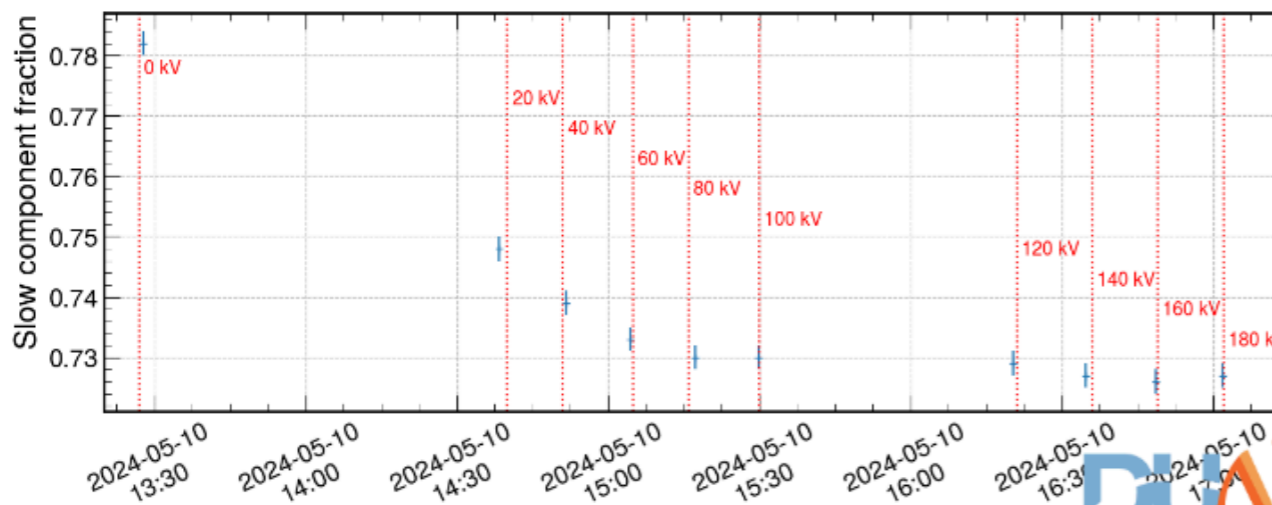


Measurement of the light slow component :

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



- with the drift field
  - ↳ see a reduction of  $\tau_{\text{slow}}$  with  $E_{\text{drift}}$  as first observed first in the dual-phase demonstrator
  - ↳ Modification of the fast/slow proportion with  $E_{\text{drift}}$  ; also seen in the dual-phase demonstrator

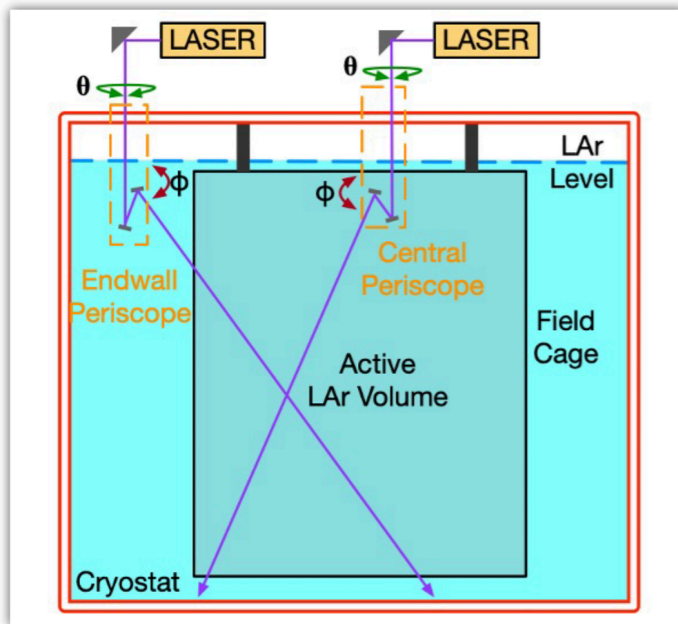


- Calibrations ongoing

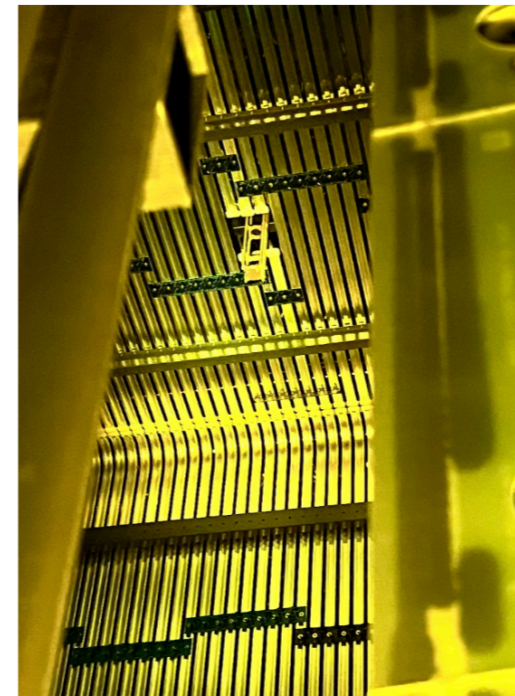
# ProtoDUNE-HD : laser

Updates from laser team

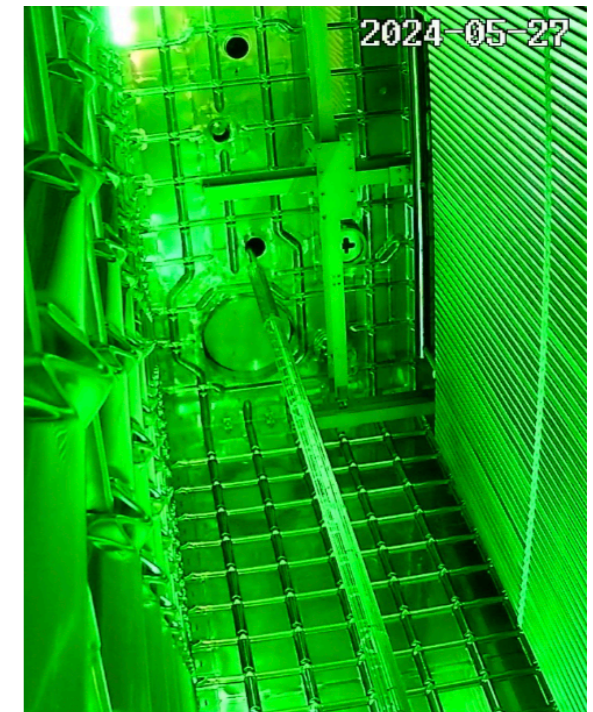
-> Two laser system installed in PDHD



P1= central

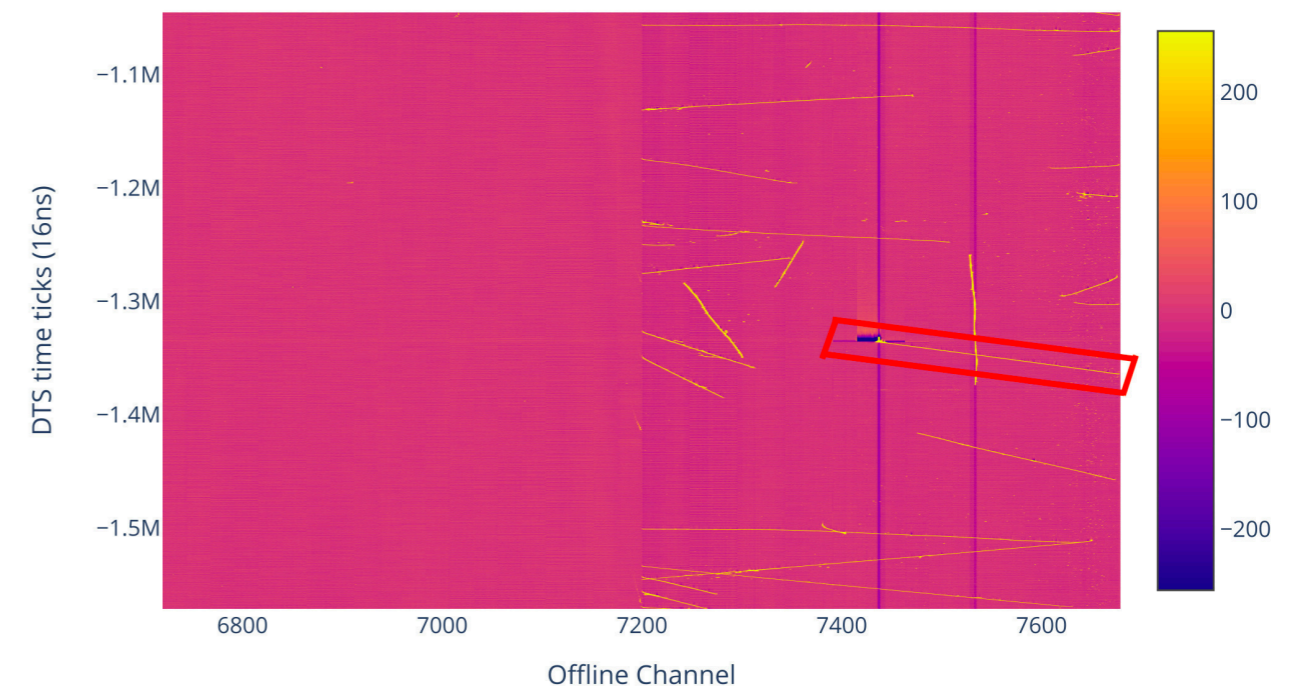
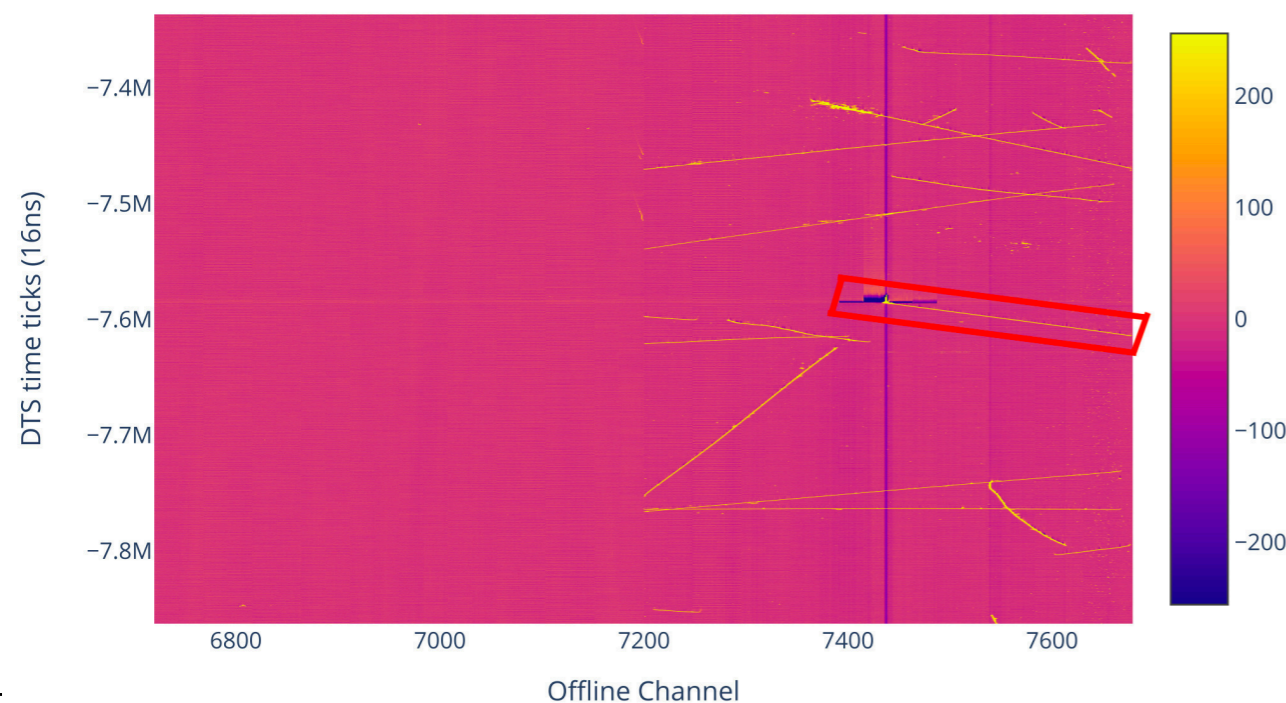


P2= endwall

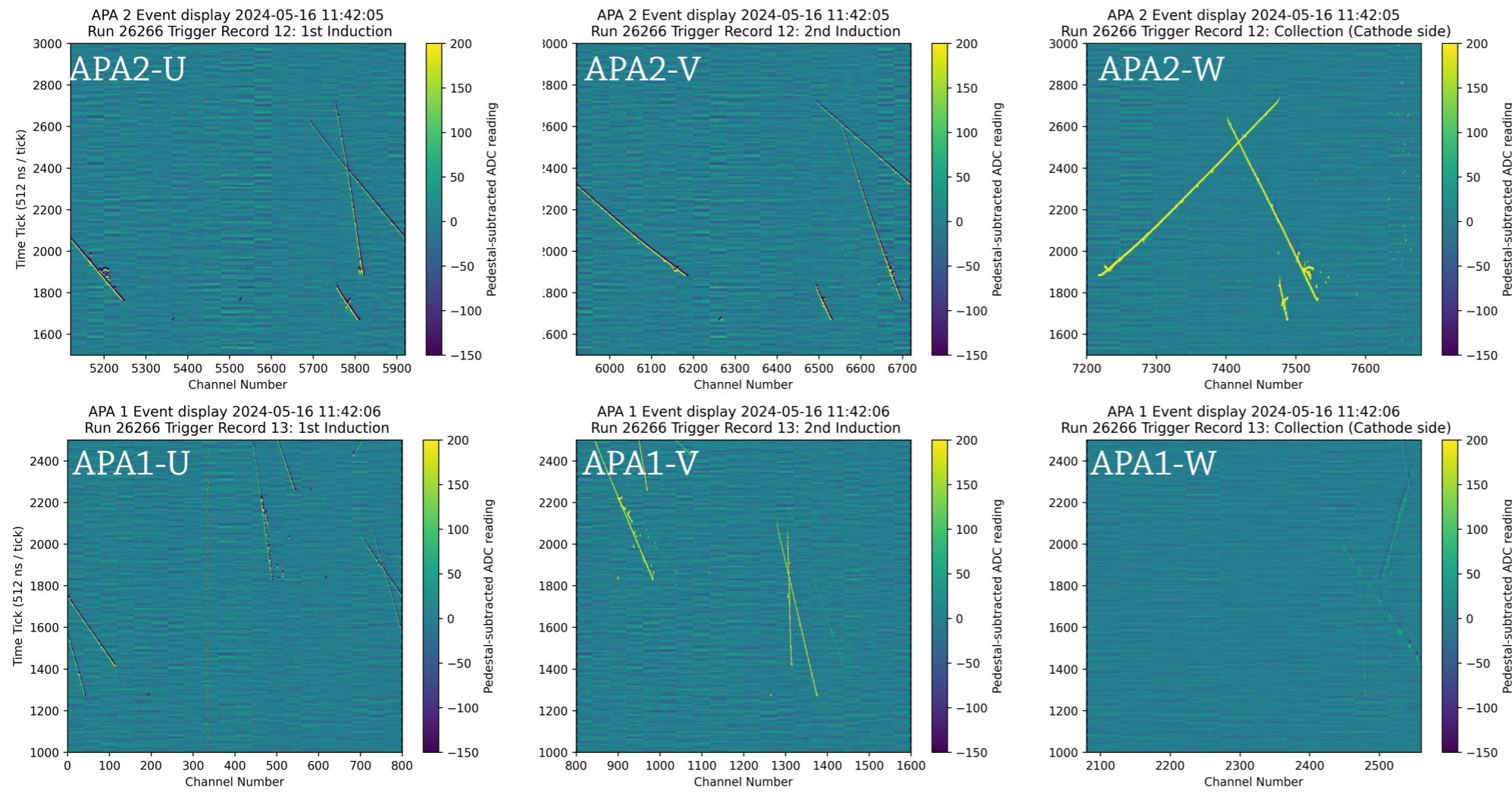


Run 26574, Trigger 4, APA2 Plane 2

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

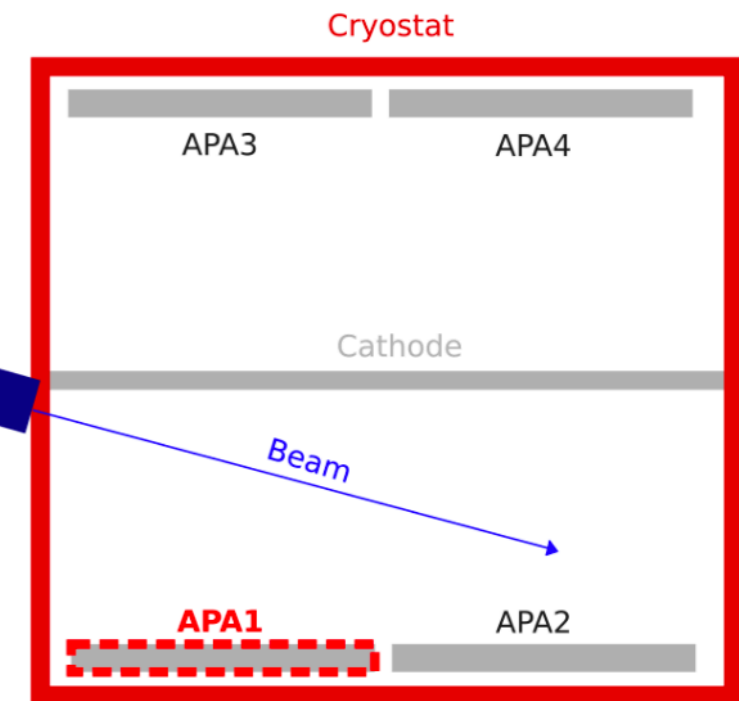
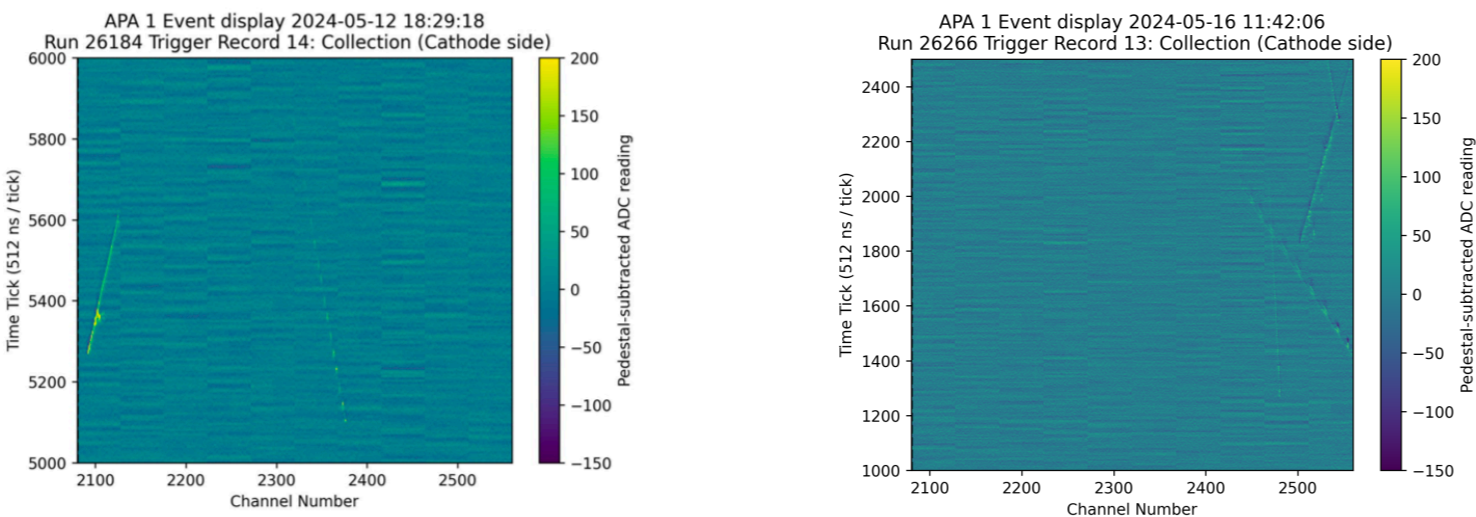


# ProtoDUNE-HD: APA-1



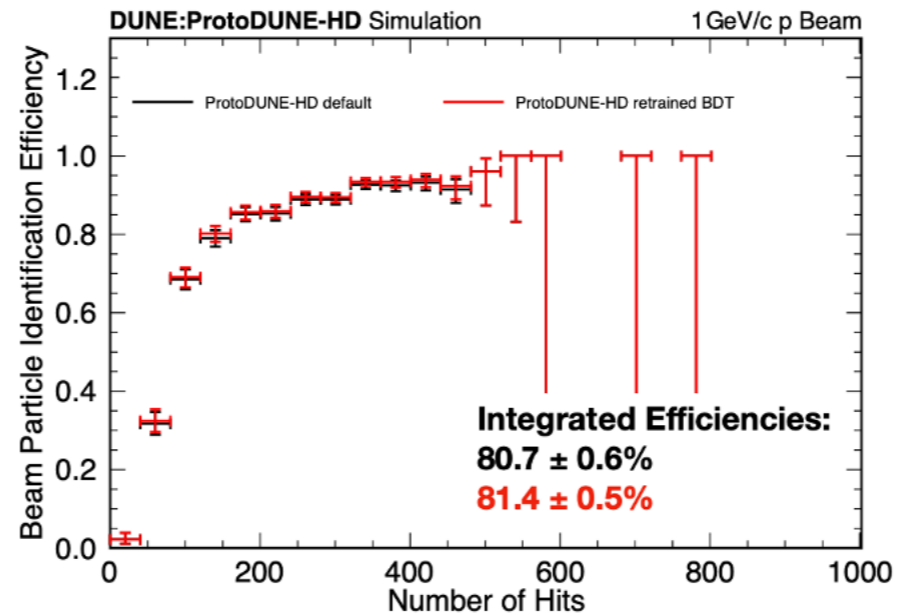
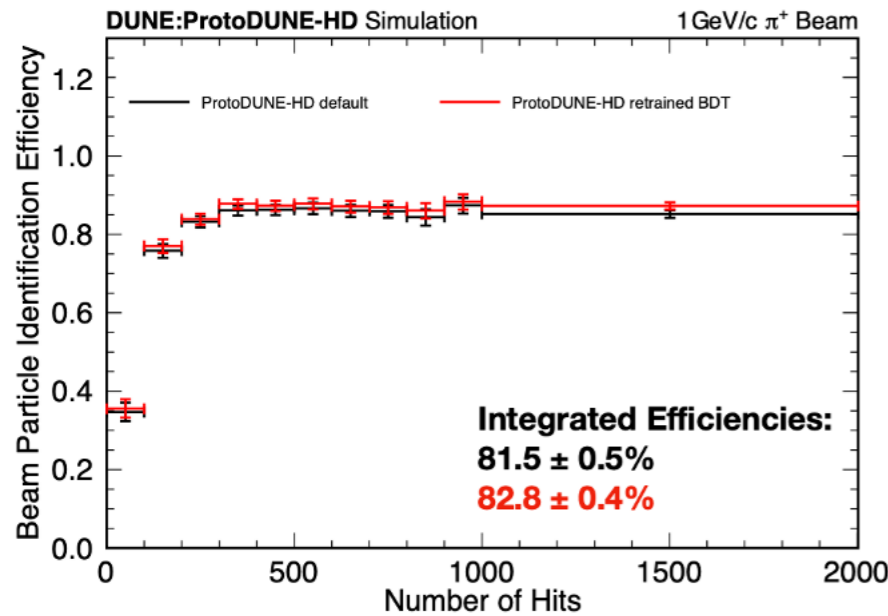
Bias to the APA-1 W collection view does not work  
 -> W plane is floating  
 -> cannot be fixed  
 -> Electrons are mostly collected on V view  
 -> APA1 is considered as a 2-view detector

## Response of the APA1-W plane evolves with time

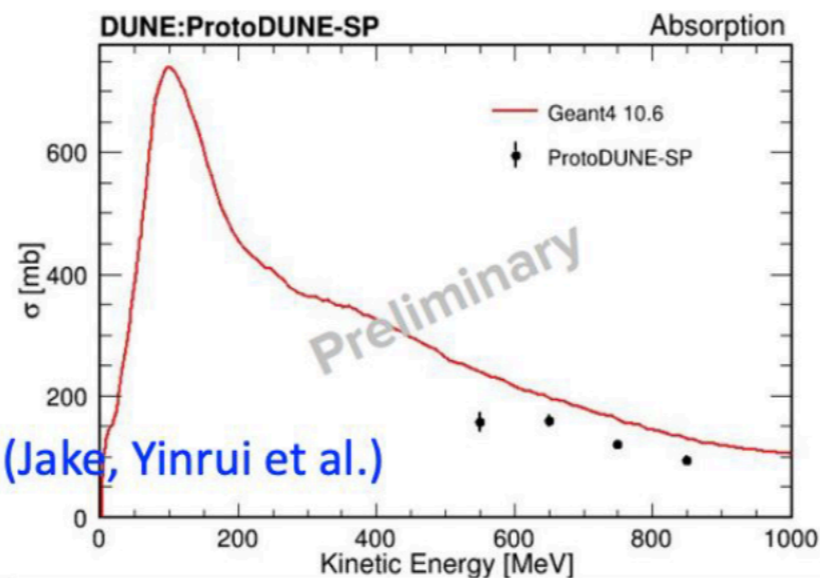
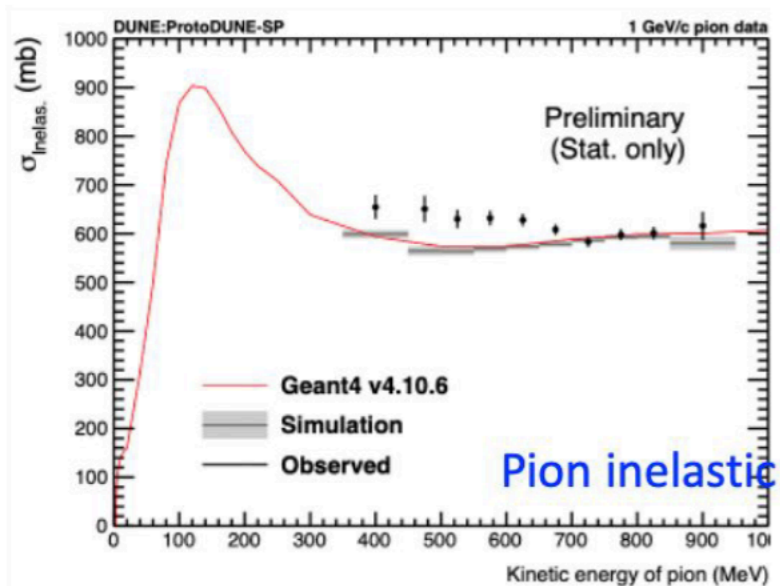


# ProtoDUNE-HD : Beam

Reconstruction & Identification Efficiencies for 1 GeV/c beam retuned



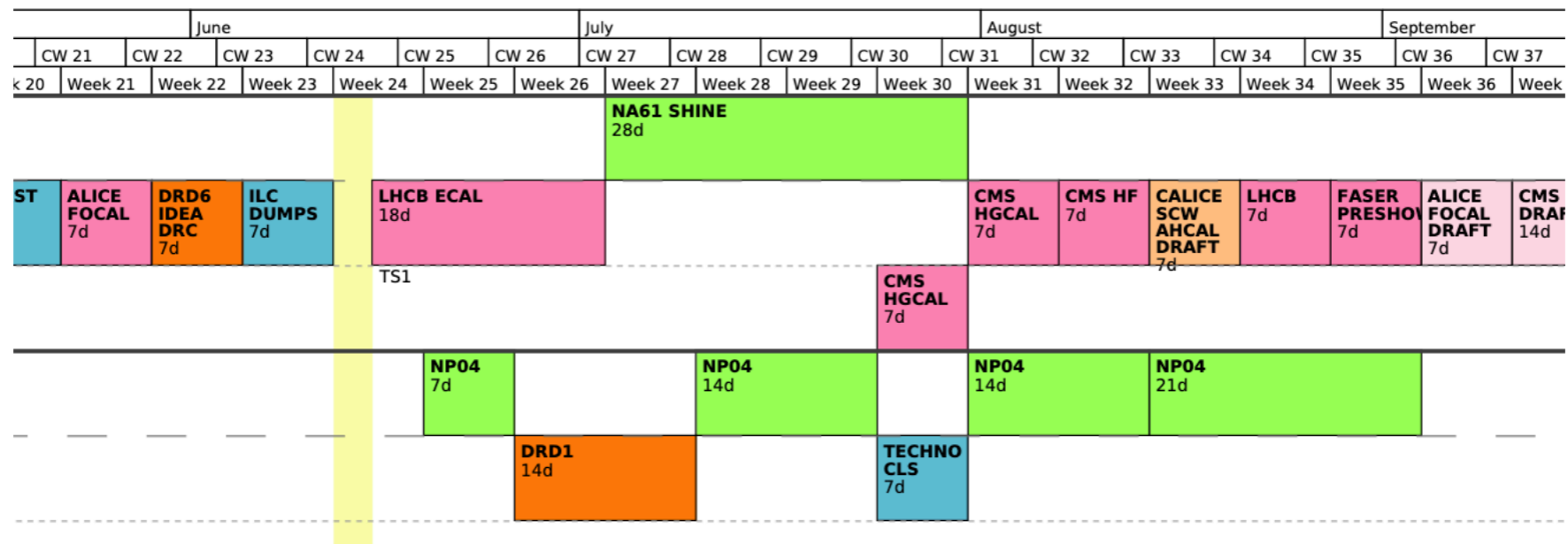
~80% efficiency when 3-view detector  
 -> As one plane is missing, these efficiencies needs to be re-computed with new Pandora algorithms



Open question: how to fine-tune the beam to reach the  $\Delta$  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

- $\pm 1$  GeV/c data : pion/proton inclusive and exclusive (differential) cross sections
- $\pm 5$  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

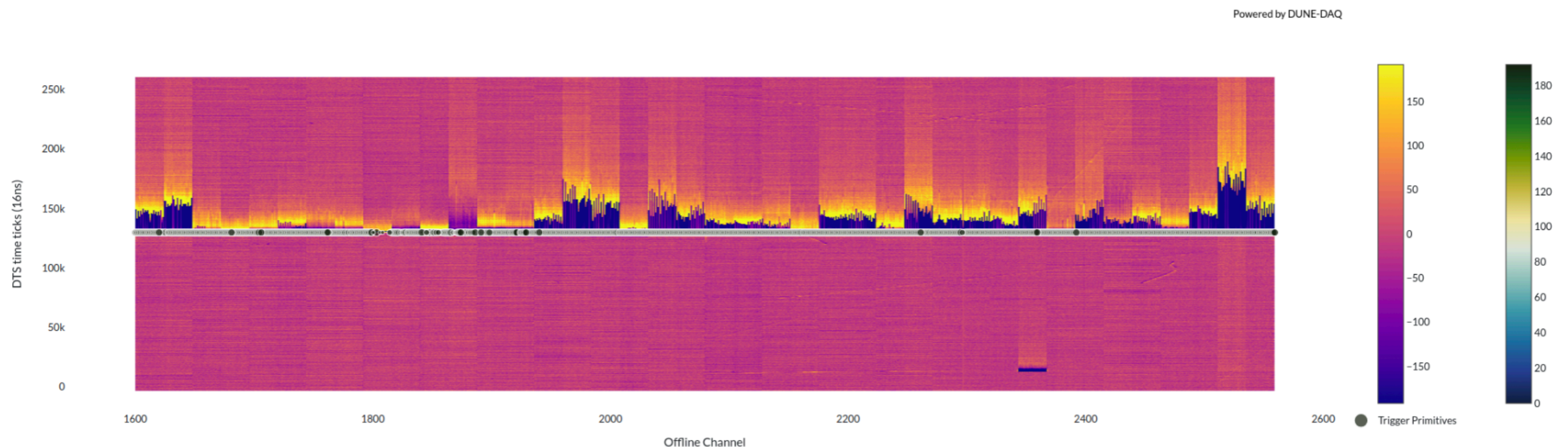
-> All wires of all APAs sees a discharge-like blip simultaneously

-> 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

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





# CRP tests

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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

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ProtoDUNE physics coordinator: [Christos Touramanis](#)

NP04 Coordination mailing list: register to CENF-NP04-II [through your CERN Account](#)

Meeting every Tuesday at 3pm : [indico page \(usual DUNE password\)](#)

Elog for NP04 [here](#) - NP02 [here](#)

Non-beam data taking: only during working hours [Light shift schedule](#)

During beam: will be announced later

Slow control App: [NP04](#), [NP02](#)

On the spot informations from the control room

-> Follow [#np04-shifterassistant](#) slack channel

Get involved with the analysis :

-> DRA contact [me](#), [Leigh](#) and [Wenqiang](#)

-> Calibration: contact [Rhiannon](#) and [Mike](#)

-> Offline coordination: contact [Jake](#)

Links of useful links: [DAQ twiki](#)