

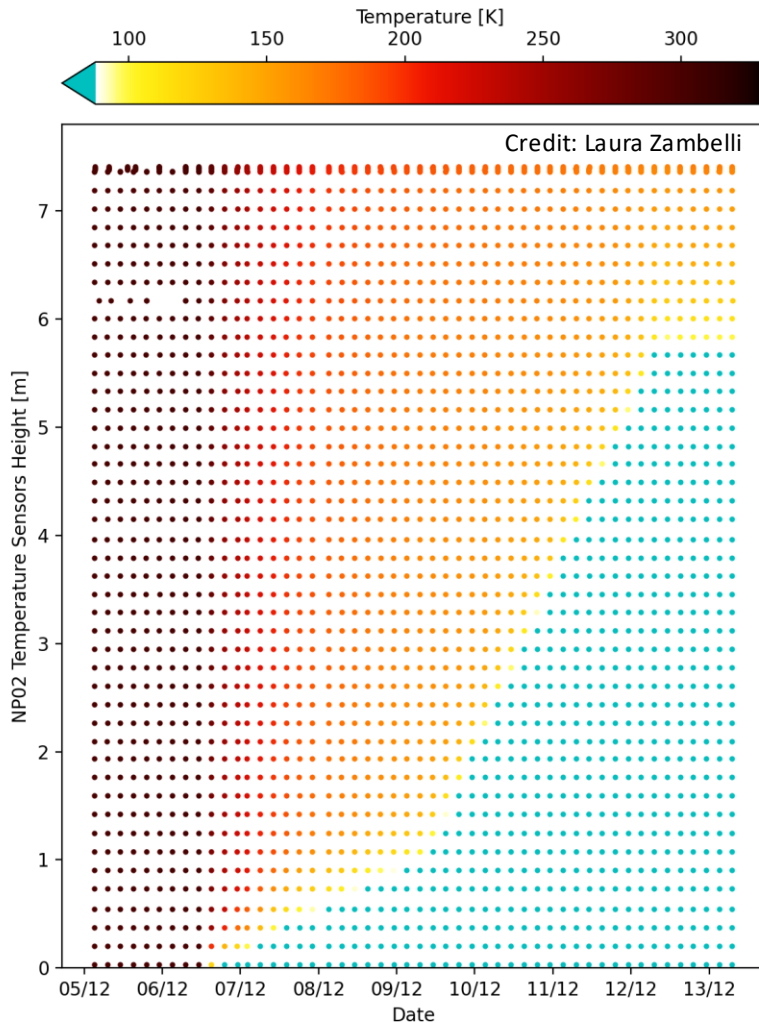
# ProtoDUNE-VD data/sim production

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DUNE production meeting

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# Context



- ProtoDUNE-VD partially immersed since beginning of December
- Bottom CRPs biased and cathode at 20 kV (60 V/cm) for tests
- First tracks observed and BDE noise level investigated (see #np02-shifterassistant)
- Final top-up should happen by the CM
- **Perfect case for testing the data reconstruction chain and set up the keep-up process**

# Some raw numbers

- Since Dec 10<sup>th</sup> (runs 033233 - 035280):
  - 4089 of raw files
  - 17 TB on disc
  - ~4.2 GB/file
- One long standing run over Christmas break:
  - 035283
  - 1905 files

# The reconstruction scheme

- FHICL file available since Dec. 20<sup>th</sup>
- [https://github.com/DUNE/dunesw/blob/develop/fcl/protodunevd/reco/protodunevd\\_data\\_reco.fcl](https://github.com/DUNE/dunesw/blob/develop/fcl/protodunevd/reco/protodunevd_data_reco.fcl)
- BDE CRP only for now:

```
reco: [  
  tpcrawdecoder, #DAPHNE decoder  
  rns,  
  wclsdatavd, #WireCell signal processing  
  gaushit, #Hit finder  
  reco3d, #Space point solver  
  hitpdune, #Disambiguation  
  pandora, #Tracking/showering  
  pandoraTrack, #...  
  pandoraShower, #...  
  pandoraStdcalo, #Calorimetry  
  pandoraGnocalo #...  
]
```

- TDE not yet part of the main DAQ stream (work in progress)
- No PDS data collected so far & waiting for PDS channel map.

# Typical example

- root://fndca1.fnal.gov:1094  
/pnfs/fnal.gov/usr/dune/tape\_backed/dunepro/vd-protodune/raw/2024/detector/cosmics/None/00/03/52/78
- np02vd\_raw\_run035278\_0010\_dataflow0\_datawriter\_0\_20241219T145258.hdf5

## Decoding + Reconstruction print-out:

```
=====
TimeTracker printout (sec)      Min      Avg      Max      Median      RMS      nEvts
=====
Full event                    44.2882   47.4523   58.4576   45.7792     3.56366   36
=====
source:HDFSRawInput3(read)    3.0117e-05  3.73853e-05  9.0693e-05  3.426e-05  1.05087e-05  36
reco:tpcrawdecoder:PDHDTPCReader  2.31666   3.02268   4.038     3.02012   0.425341    36
reco:rns:RandomNumberSaver    2.0569e-05  2.89669e-05  0.000183881  2.2383e-05  2.66798e-05  36
reco:wclsdatavd:WireCellToolkit  40.0535   42.9323   51.9569   41.1449   3.34311     36
reco:gaushit:GausHitFinder    0.00221242  0.0052747  0.0110193  0.00447616  0.00249871  36
reco:reco3d:SpacePointSolver  0.00121906  0.00360835  0.00737553  0.00303127  0.00141773  36
reco:hitpdune:DisambigFromSpacePoints  0.000164024  0.000267992  0.00133241  0.000219484  0.000195017  36
reco:pandora:StandardPandora  0.00233979  0.0268503  0.837888  0.00291499  0.137102    36
reco:pandoraTrack:LARPandoraTrackCreation  7.6136e-05  0.000105243  0.000825337  8.02785e-05  0.000122108  36
reco:pandoraShower:LARPandoraShowerCreation  6.5104e-05  7.79982e-05  0.000308691  6.77995e-05  4.02305e-05  36
reco:pandoraStdcalo:Calorimetry  7.6776e-05  0.000100829  0.000629644  8.12905e-05  8.99727e-05  36
reco:pandoraGnocalo:GnocchiCalorimetry  6.0525e-05  8.69812e-05  0.000584308  6.5736e-05  8.60637e-05  36
[art]:TriggerResults:TriggerResultInserter  8.335e-06  1.07377e-05  4.2772e-05  9.2335e-06  5.63345e-06  36
end_path:rootout:RootOutput    2.445e-06  3.711e-06  1.1952e-05  2.8805e-06  2.36691e-06  36
end_path:rootout:RootOutput(write)  1.40419   1.4423    1.60266   1.43263    0.0371224   36
=====
```

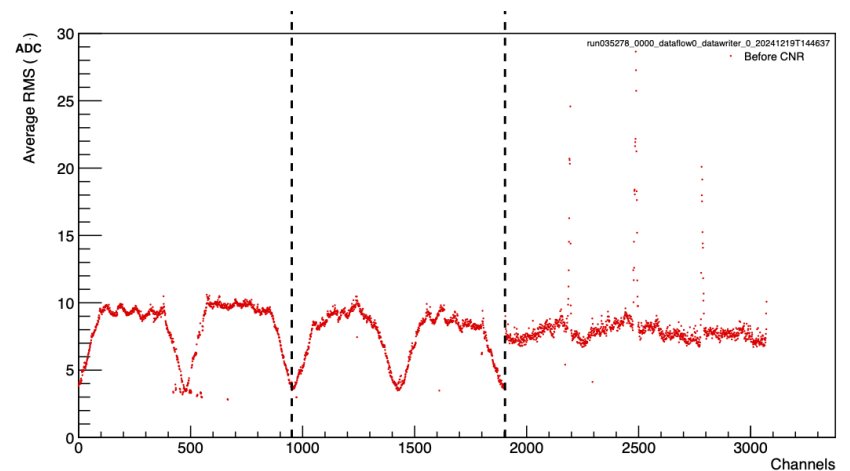
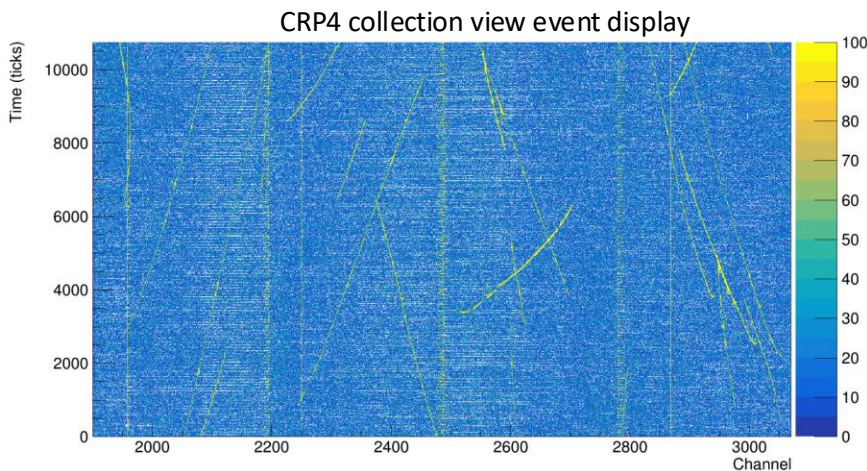
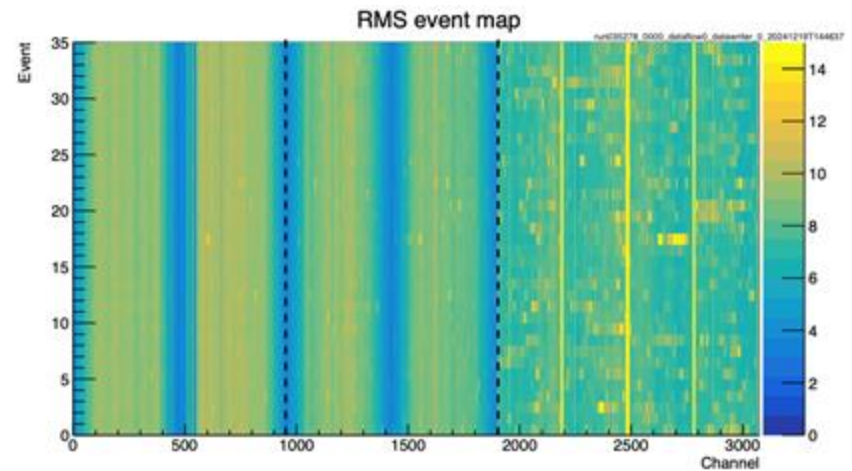
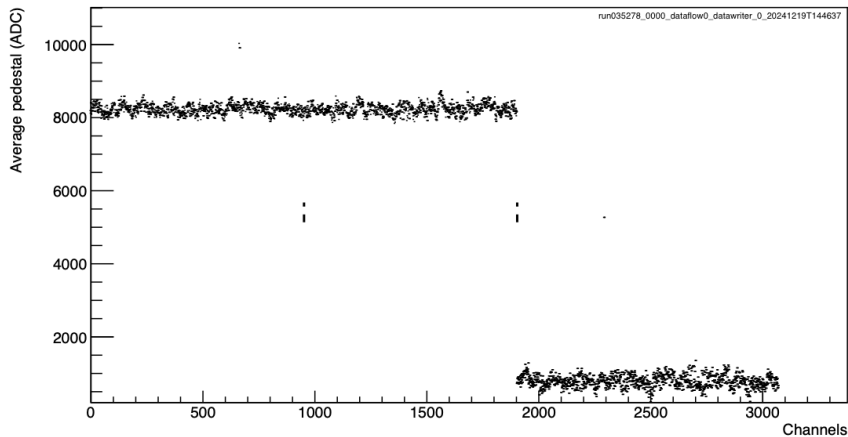
MemoryTracker summary (base-10 MB units used)

Peak virtual memory usage (VmPeak) : 4225.38 MB  
Peak resident set size usage (VmHWM): 1898.72 MB

- Output file size: 1.9 GB → 53 MB/event
- Caveat: no rec. tracks yet and calibration group may want a 2<sup>nd</sup> stage

# Baseline, noise & event display

- Some basic checks of retrieved raw::RawDigits products



# On the to-do list

- **I got access to the keepup process scripts Jake used for PDHD (crontab, bash, justin commands, ...)**
  - Need to adapt it to PDHD
  - Run tests on Dec. 2024 files
  - Add/test TDE & PDS stream decoders when DAQ will produce complete files (ongoing discussion with Tom Junk)
- **Prepare simulations proposal of:**
  - Cosmics
  - Radiologicals
  - Beam
- Also here, Jake's scripts developed for PDHD are available and could in principle be adapted and reused