Status report on

DNNROI sigproc

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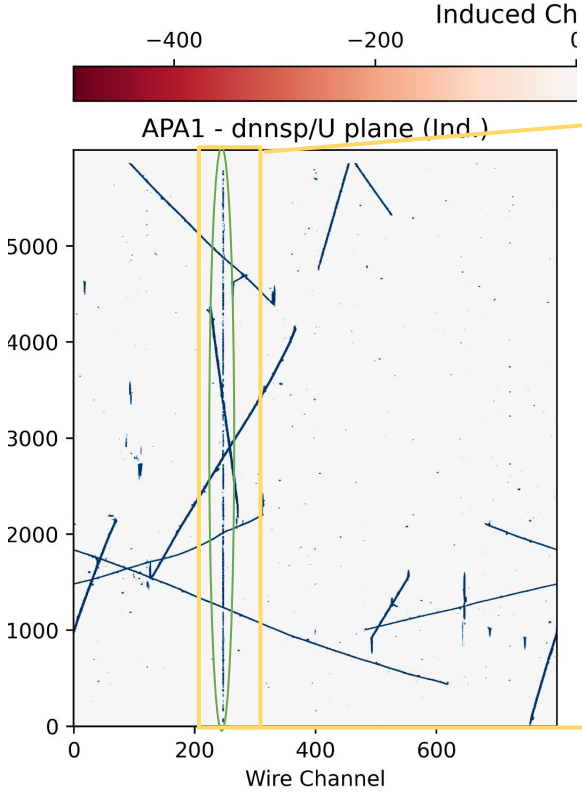
Outline

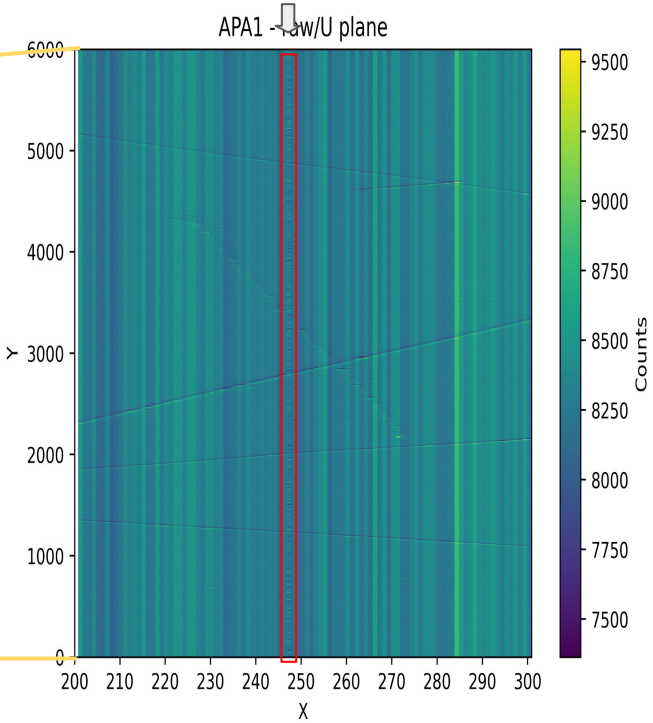
- **PDHD**
  - **Real Data 1D Waveform Study**

- PDVD
  - Debugging
  - Real Data 1D Waveform Study

APA 1 noisy channel

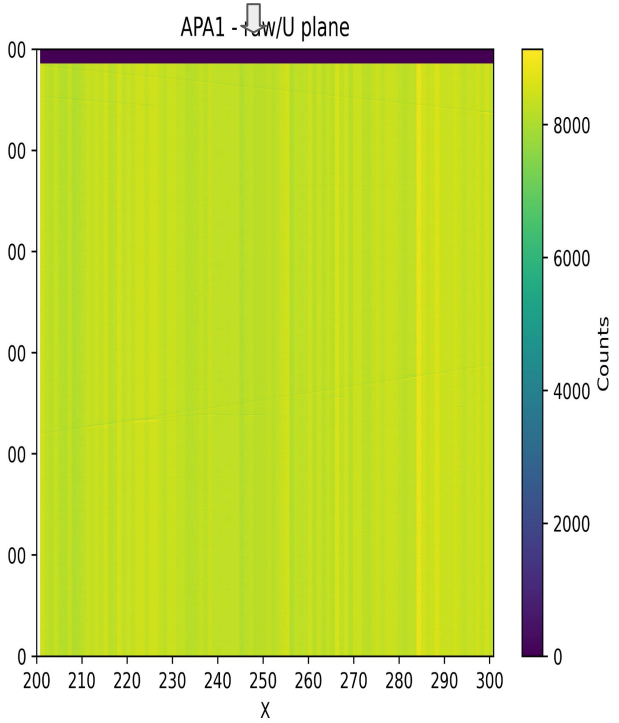


Noisy



❏ Run 026763-225

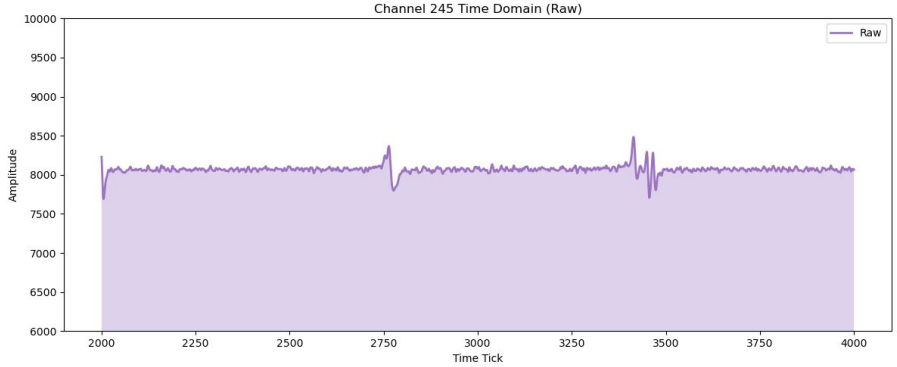
Not Noisy

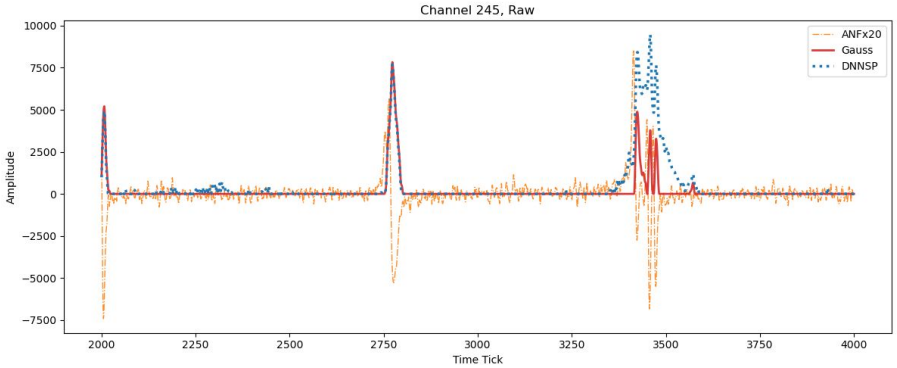


❏ Run 027673-1

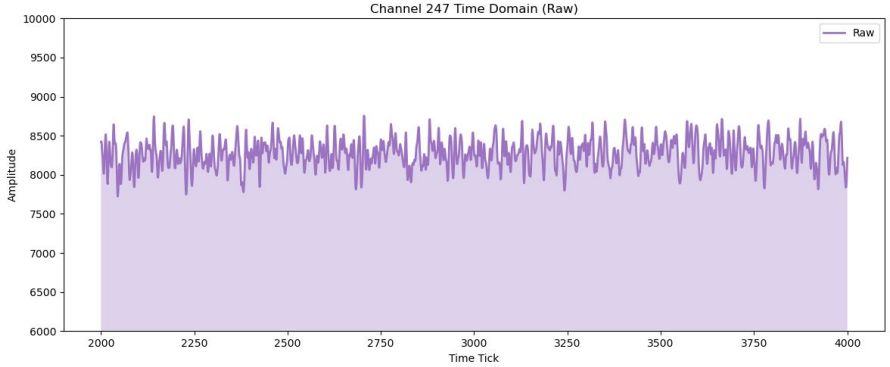
- For the APA 1, a ghost track appeared on a particular noisy channel

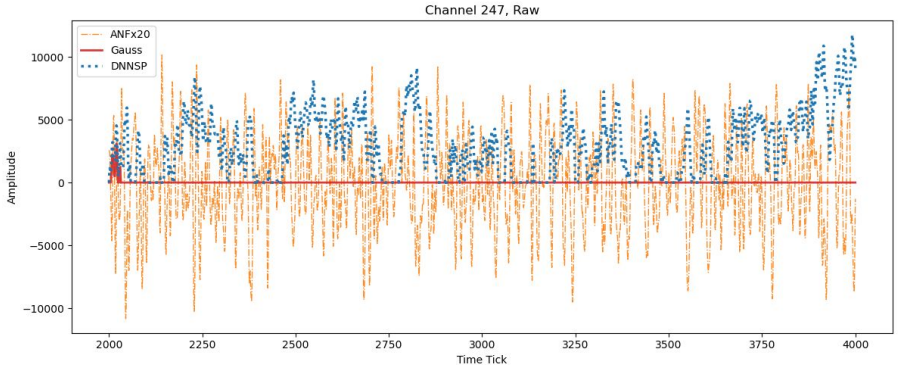
1D waveform (Run 026763-225)





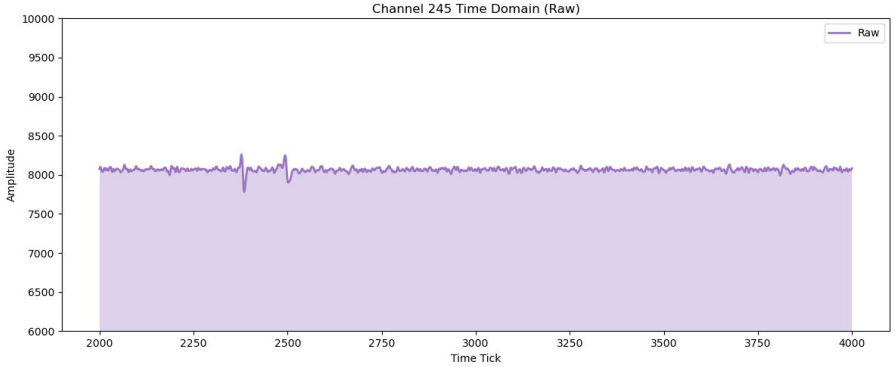
- Normal channel

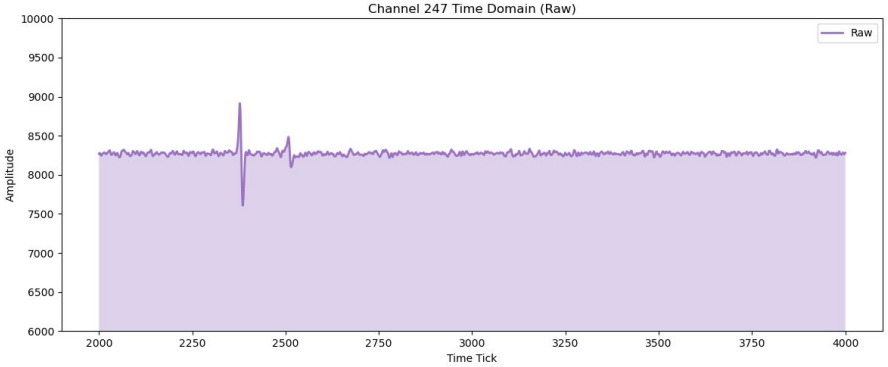


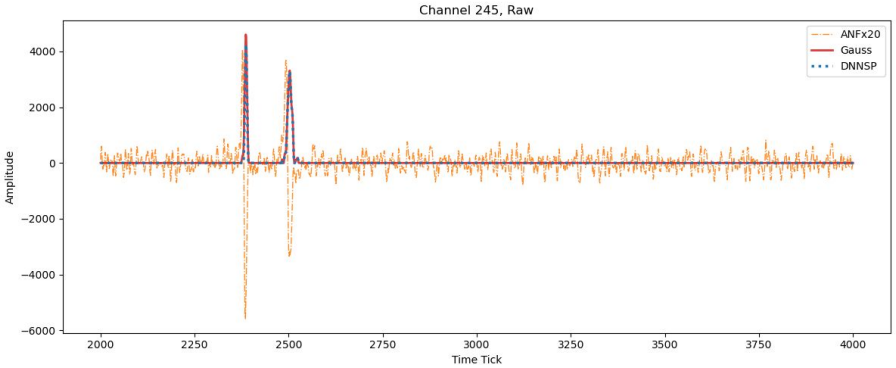


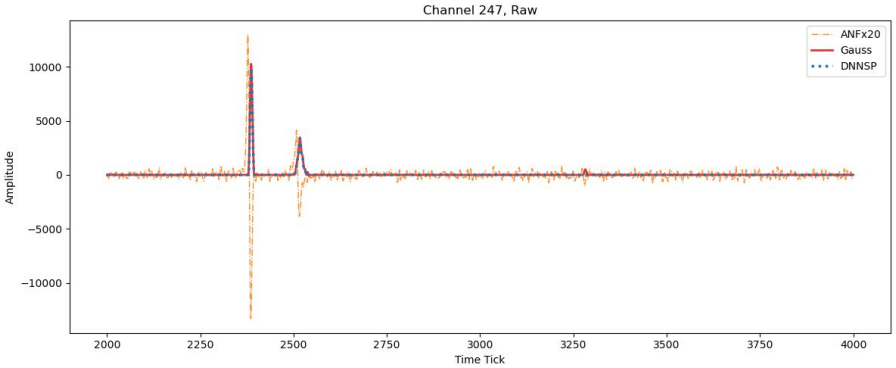
- Noisy DNN

1D waveform (Run 027673-1)



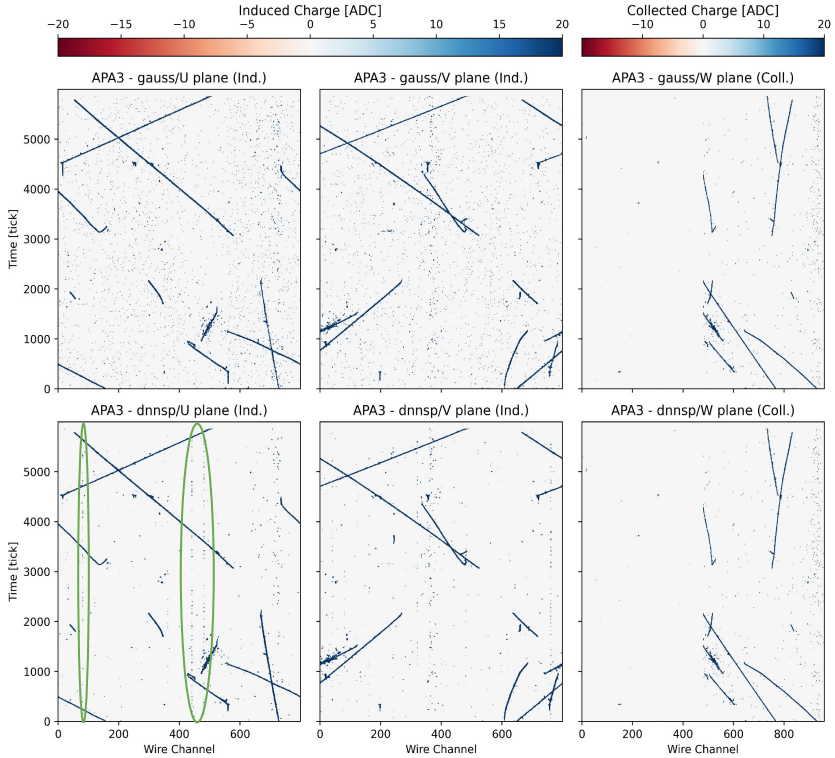






- Normal channel
- Noisy DNN

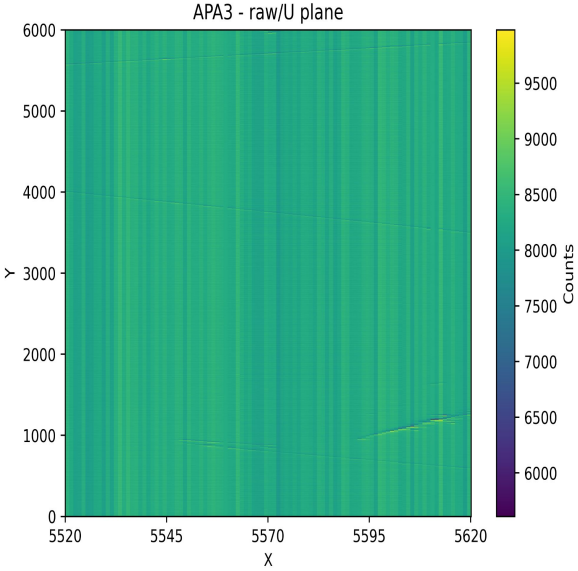
PDHD Real Data - Results w/ baseline model



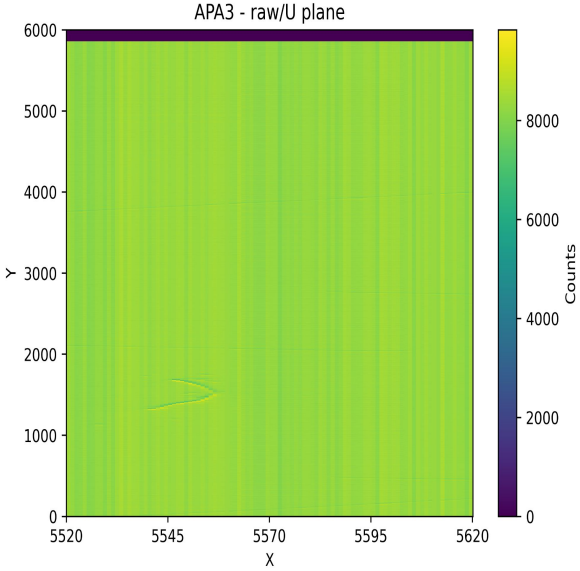
Run 026763-225 (Better, Worse, Similar, Discuss later)

- For APA3, discrete vertical noise for 3 channels consistently observed

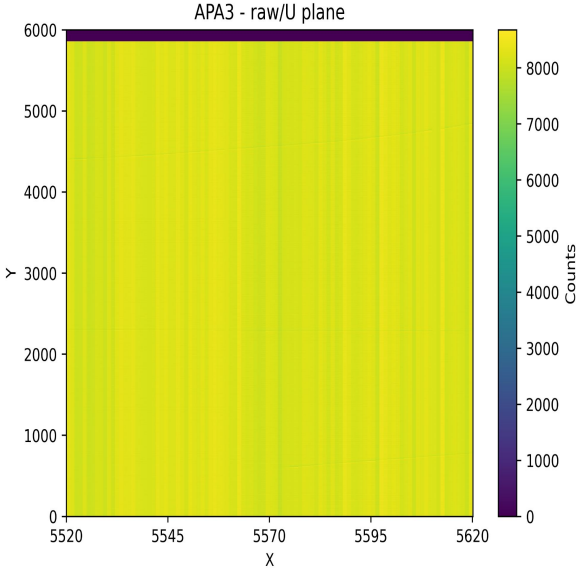
APA 3 noisy channel



❑ Run 026763-225

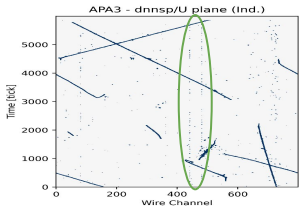


❑ Run 027673-1

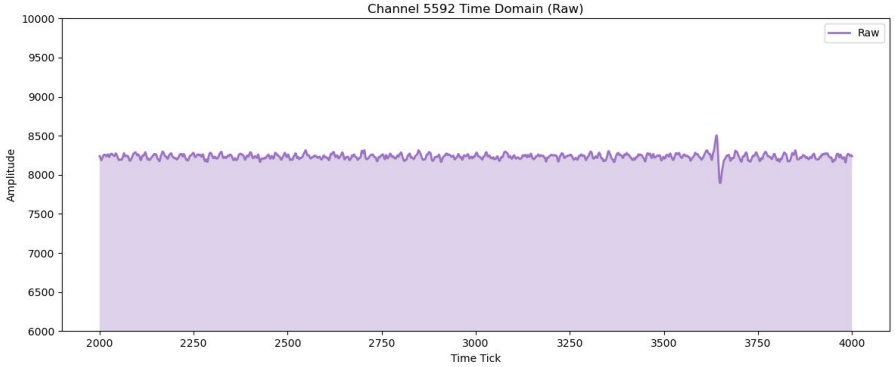


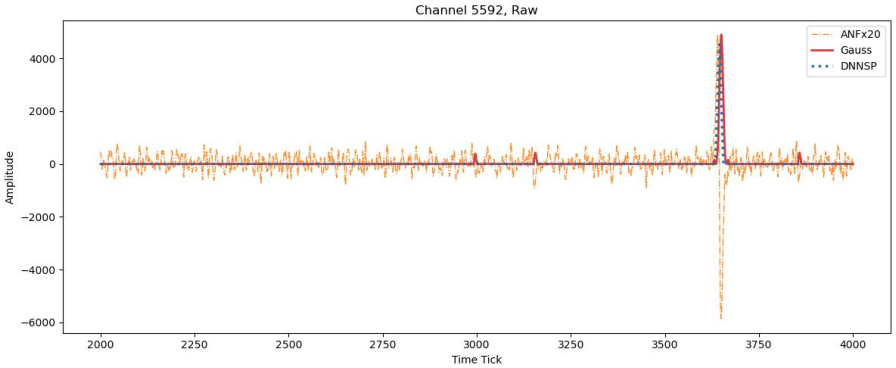
❑ Run 028588-4562

- Not like the APA 1, no noisy channel is observed for the APA 3
- Reconstructed false signals in this case seems just “noise” rather than ghost tracks

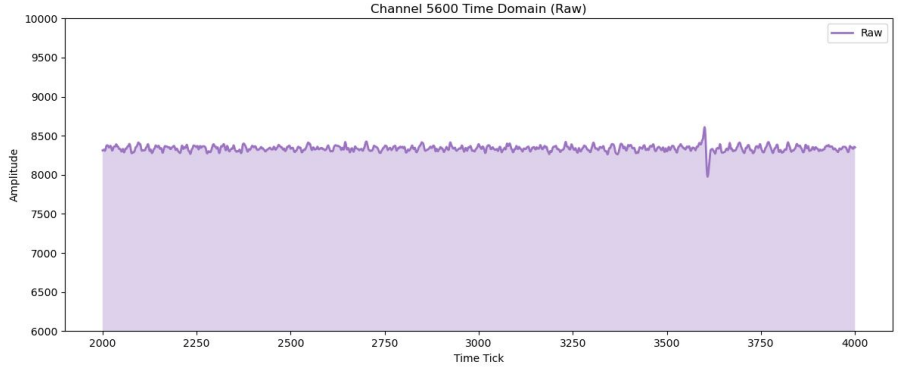


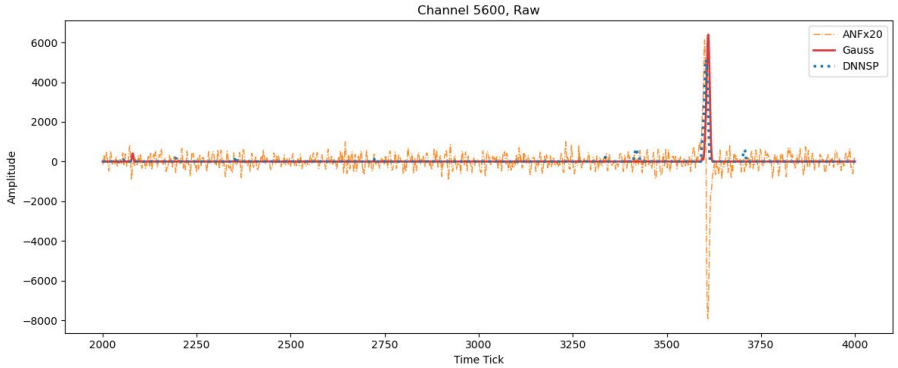
1D waveform (Run 026763-225)





- Normal channel





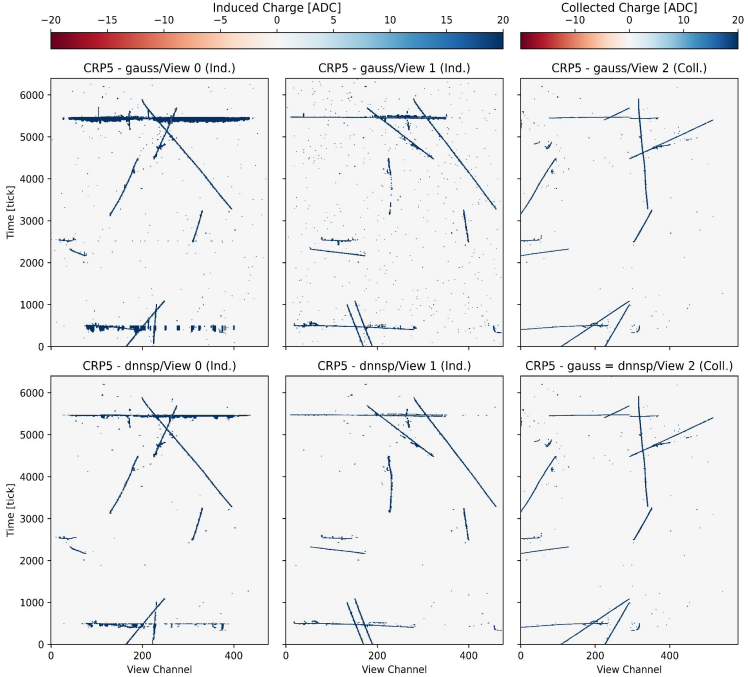
- Noisy DNN

Outline

- PDHD
  - Real Data 1D Waveform Study

- **PDVD**
  - **Debugging**
  - **Real Data 1D Waveform Study**

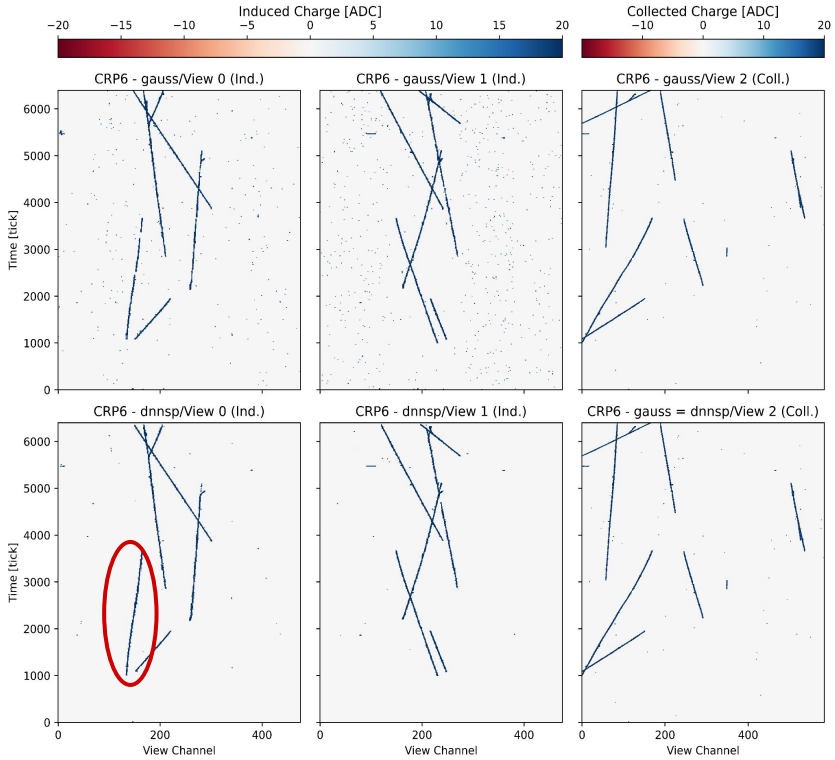
X-axis range issue




```
25  31      anode_channels :: function(n) {
26  32        local crp = (n - n%2)/2,
27      -     local cru0 = std.range(0,475) + std.range(952,1427) + std.range(1904, 2487),
28      -     local cru1 = std.range(476, 951) + std.range(1428, 1903) + std.range(2488, 3071),
29      -     local channels = if n%2 == 0 then cru0 else cru1,
    33  +     local u = std.range(0, 951),
    34  +     local v = std.range(952, 1903),
    35  +     local w = std.range(1904, 3071),
    36  +     local channels = u + v + w,
30  37        ret: [x + 3072 * crp for x in channels],
31  38      }.ret,
```

- Both sim/data has the half range in x-axis (Expected: 952 for Induction, 1168 for collection)
- It seems Fanin/Fanout pipeline only receives the cru0

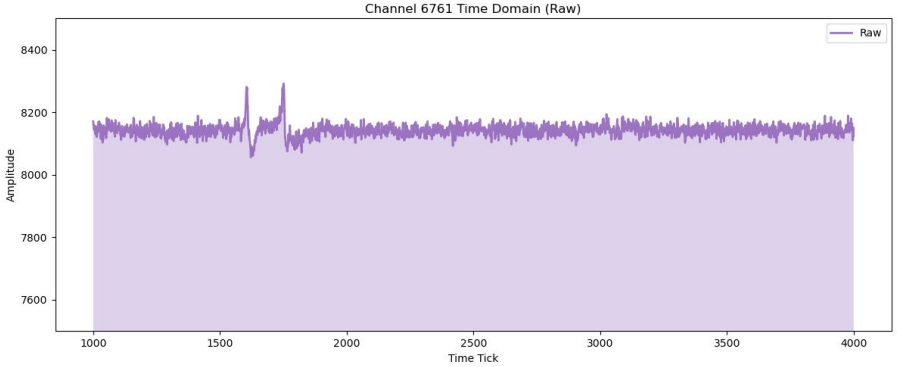
PDVD Real Data - Results w/ baseline model

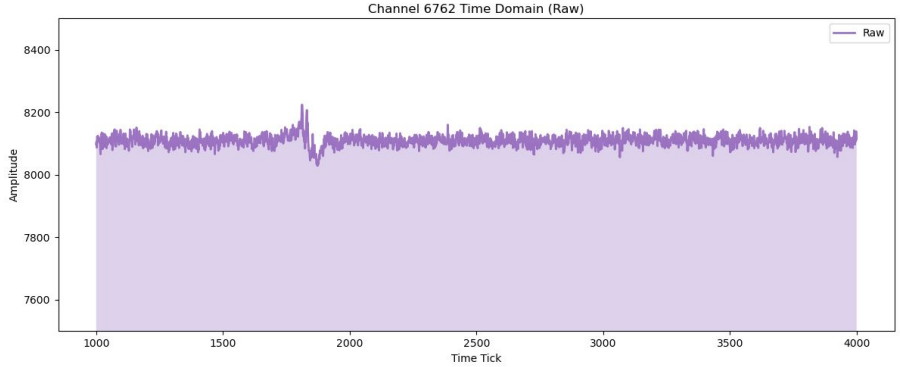


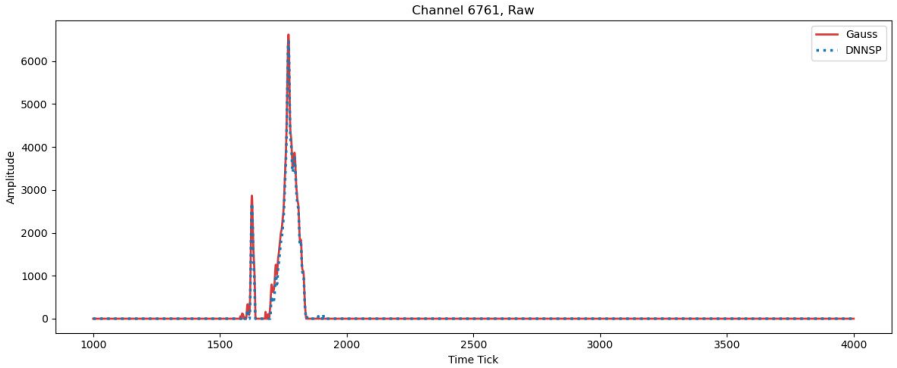
Run 039300-0106 (Better, Worse, Similar, Noisy channel)

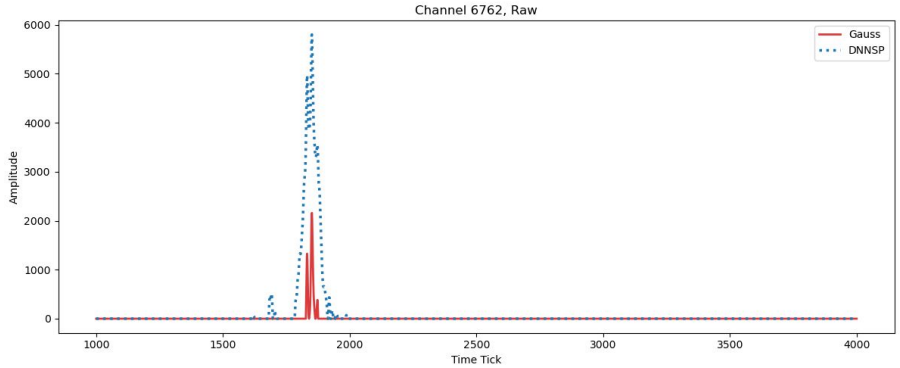
- Readout window (3.2 ms, beam), CRP: 5, 6, 7, 8

1D waveform (Run 039300-0106)





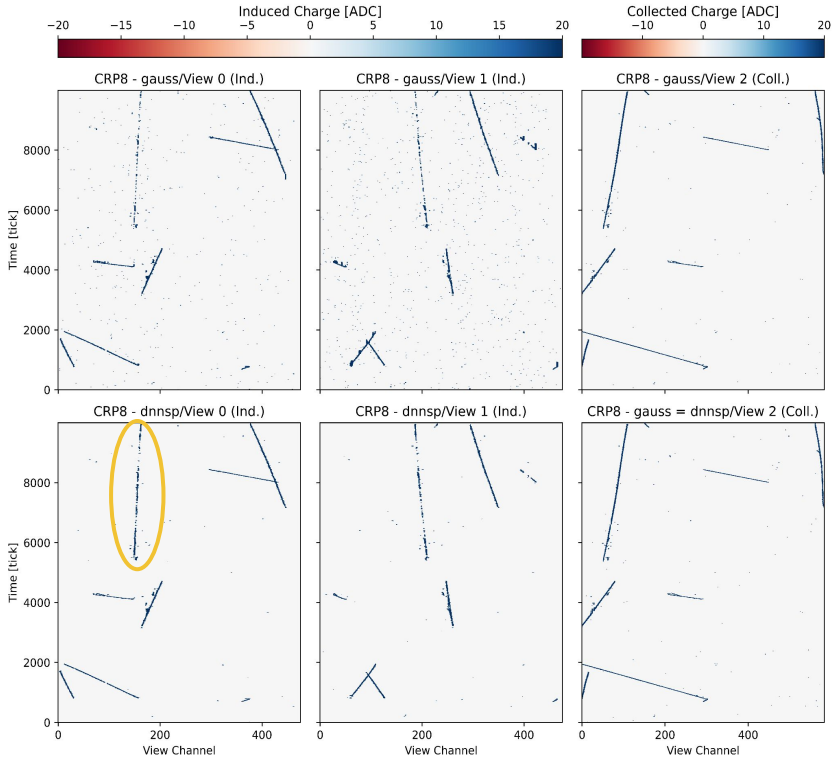




- Similar case
- DNN outperformed case

- From the raw waveform, PDVD is more noise along the time axis than PDHD

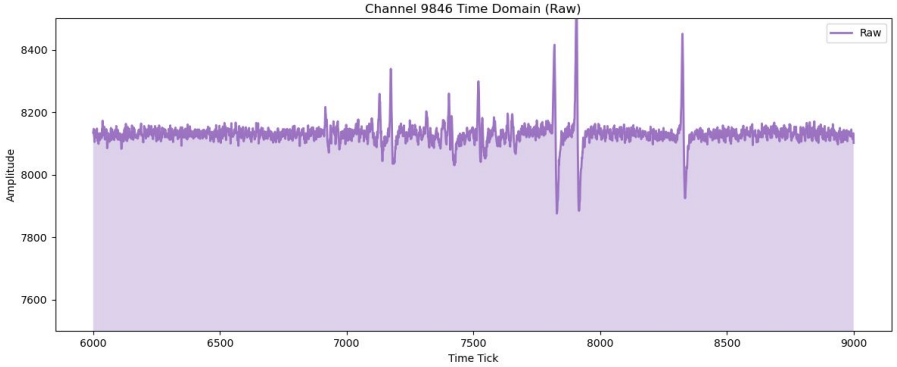
PDVD Real Data - Results w/ baseline model

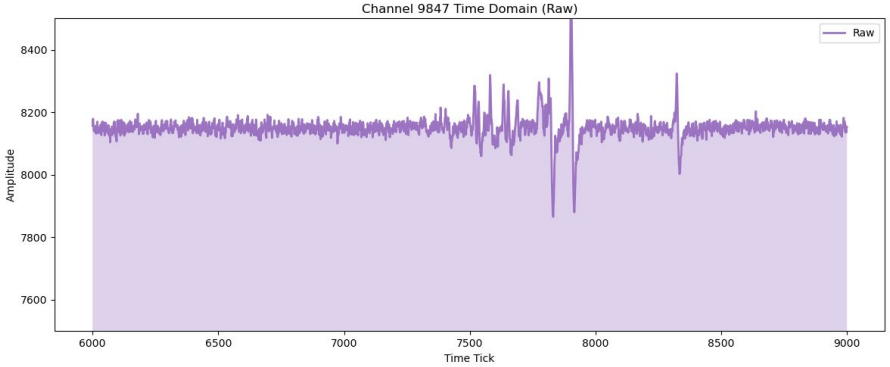


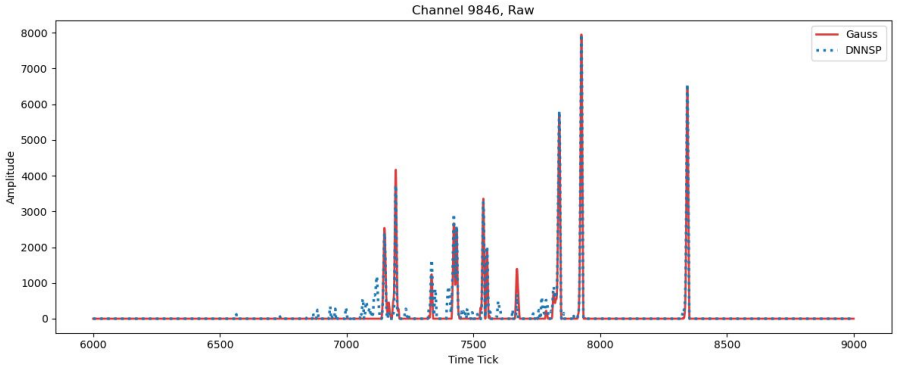
Run 039300-0115 (Better, Worse, Similar, Noisy channel)

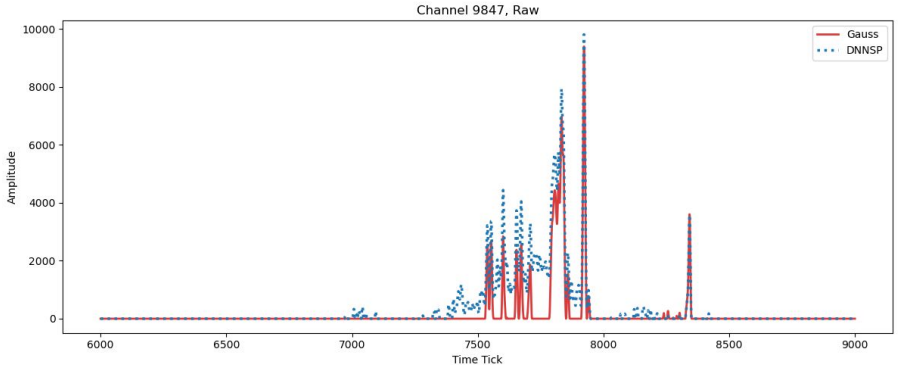
- Readout window (5 ms, random), CRP: 5, 6, 7, 8

1D waveform (Run 039300-0115)







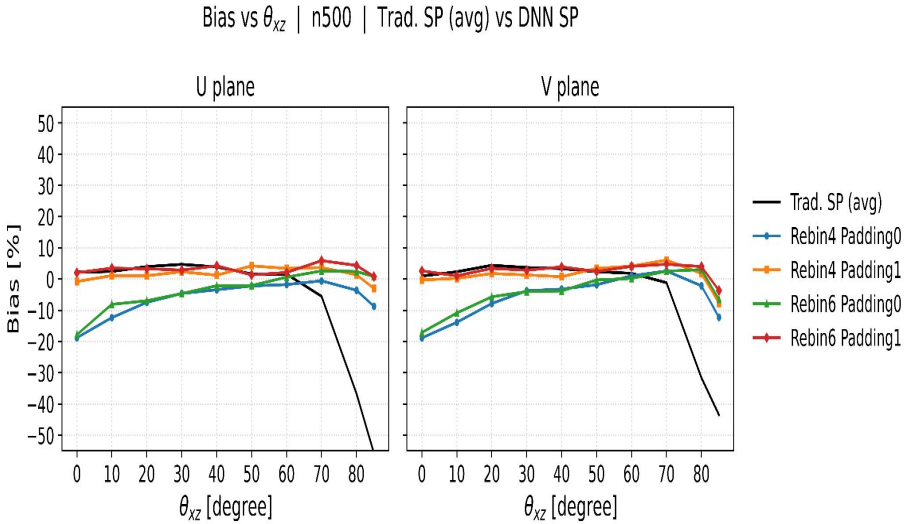


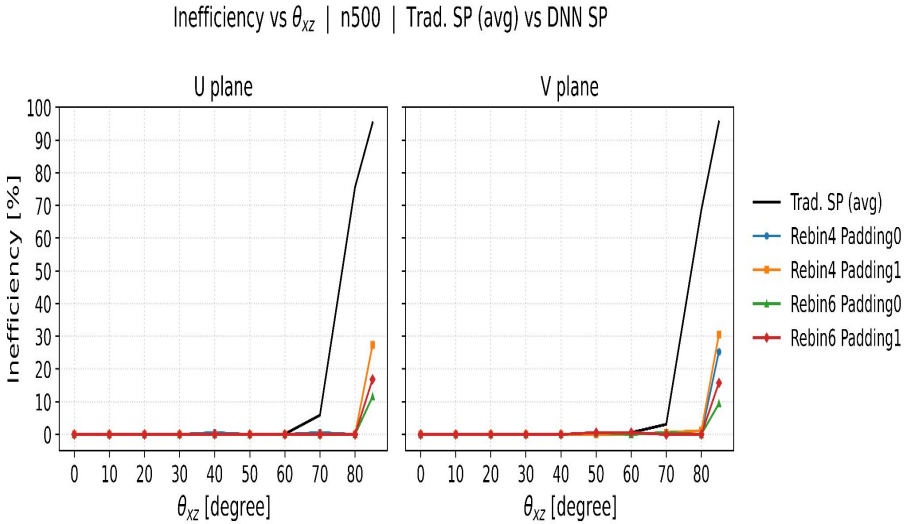
- Similar case
- DNN outperformed case

- From the raw waveform, PDVD is more noise along the time axis than PDHD
- More bipolar signals spread over time → DNN less effective

Back Up

Single Track Evaluation - WC standalone

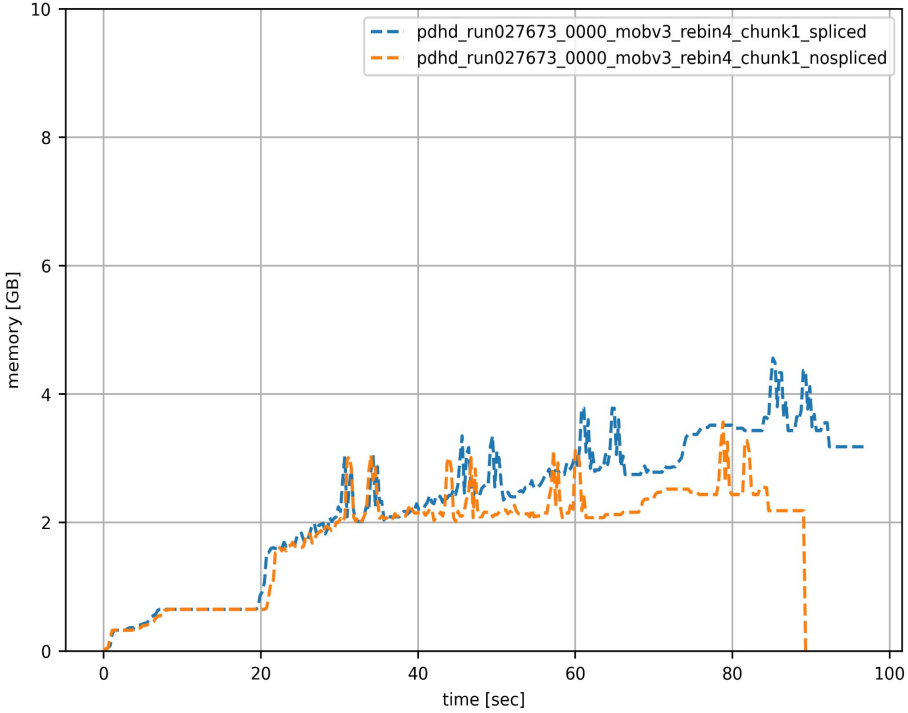




- Implemented padding strategy successfully reduced bias in isochronous cases
- The best combination from this evaluation:

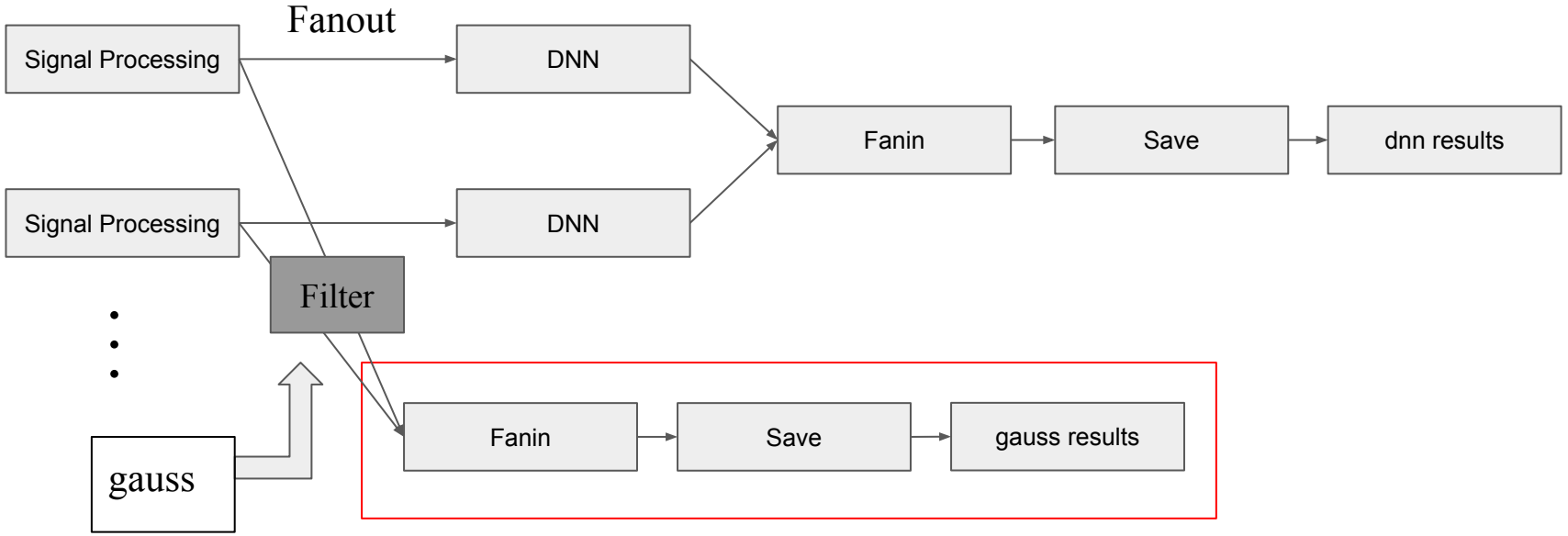
Rebin	Truth_th	Padding
6	100	both side, 1

Memory Profiling - Activity Logger



- Tested with PDHD data 027673-0000
- Orange - no spliced vs. Blue spliced
- Accumulated memory is solved
  → Pedestal is decreased about 1 GB
- What is the “spliced” option?

Memory Profiling - Spliced Explained



Expected memory ~ few MB

Spliced = true

→ Memory would be still accumulated per APA processing, but not that big as before

Many thanks to Brett and Haiwang