Conclusions

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DEEP UNDERGROUND
NEUTRINO EXPERIMENT

LET'S NOT SPEND TOO MUCH TIME TRYING TO FIX ISSUES THAT A
FEW BILLION DOLLARS WORTH OF DIGGING AND CONCRETE WILL
RESOLVE.

Josh Klein, PD/DS meeting

- Most issues we see in the readout and trigger are related to high TP rate.
  - NP0Xs are at the surface, where we're saturated by cosmics.
  - Will only get a few thousand a year at the FD – not an issue.

- For most of them, we have ready or planned solutions.

- We cannot do TPG on all three planes with the thresholds we want.
- But we CAN do TPG on one plane/APA, which is what we did in many CBs.
  - We trigger on collection, but still save the raw data from all 3 planes!
- And there's an elegant solution ready to be tested.
  - It will allow us to do TPG on all three planes.
  - It will have positive effects on trigger physics-wise & performance-wise!
- The good news: per-plane TPG stable, we fill tracks even on induction!
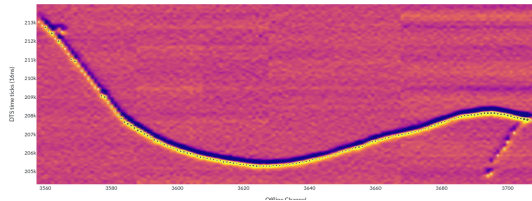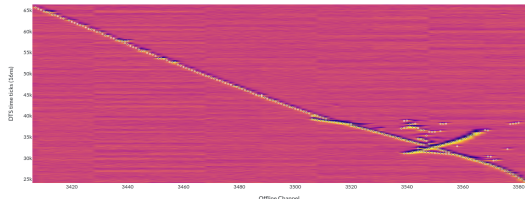
- Trigger struggling with making the TriggerActivities given the TP rate.
- Can just trigger with the simplest algorithm we have: ADCSimpleWindow.
  - This is most likely the type of algorithm we will run at the FD anyway.
  - No point getting cosmics with soft. in PD2: random trigger has at least 10.
- It is now successfully used for triggering on anomalous HW blips at ∼1-2Hz!
- Further speed improvements planned: e.g. ring buffer with memory mirroring already in development.
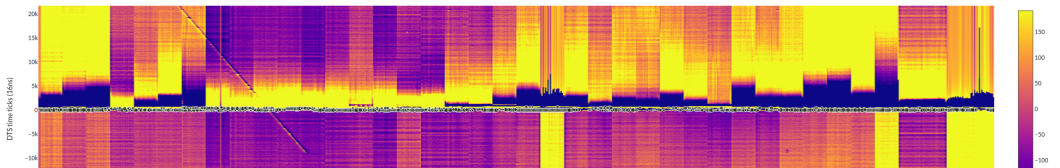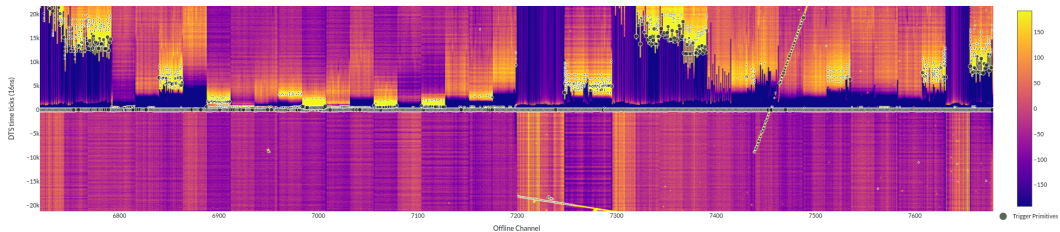
Trigger:

- The biggest issue in the trigger is the memory leak.
- With wide TA windows we crash in 30 minutes. With HW blip trigger in 1.5 day.
- Planned: better monitoring of the TAZippers, TA/TCBuffers, replay.

Hardware blips:

- The hardware group worked tirelessly on the blips we see.
- We see them with the anode bias off, but not with cathode off.
- Work, planning, thinking ongoing, but no smoking gun yet.