

Summary of last week (May 15) activities

Status of INFN GEM commissioning (got help from Tongtong and Siyu)

- Apply HV on all 9 modules of the 3 layers for several hours. All holding the HV up to 3.95 kV (might be able to go up to 4 kV but not necessary with Ar-CO₂ 75/25)
- We had a problem with Ar-CO₂ bottle that emptied after a day even at a very low flow in the chambers
 - Suspected problem with the regulator \Rightarrow replace it with the one used for Danning UVa GEM tests
 - Will start flowing gas again today to take data
- Fix the trigger latency issue we discuss last week
 - NIM gate module \Rightarrow Change the trigger delay in the configuration file
 - When I put the module back \Rightarrow will go back to the previous value
- We can now see cosmic signal in the chambers
 - Will go over a few plots in the coming slides
 - A few issues need to be discuss on APV25 data I am seeing right now
- I am still having some problems with 2 MPDs and a few APVs
- We need the latest version of Siyu decoding / Analysis code to be able to make good sense of the current raw data we are seeing
 - Siyu works on a few fixes on the Makefile
 - Few other issues with the datafile type need to be fixed
 - This fixes has to be a priority this week so that we start analyzing the data in a meaningful way

What a raw data plot looks like



For these events only 100 APVs are shown

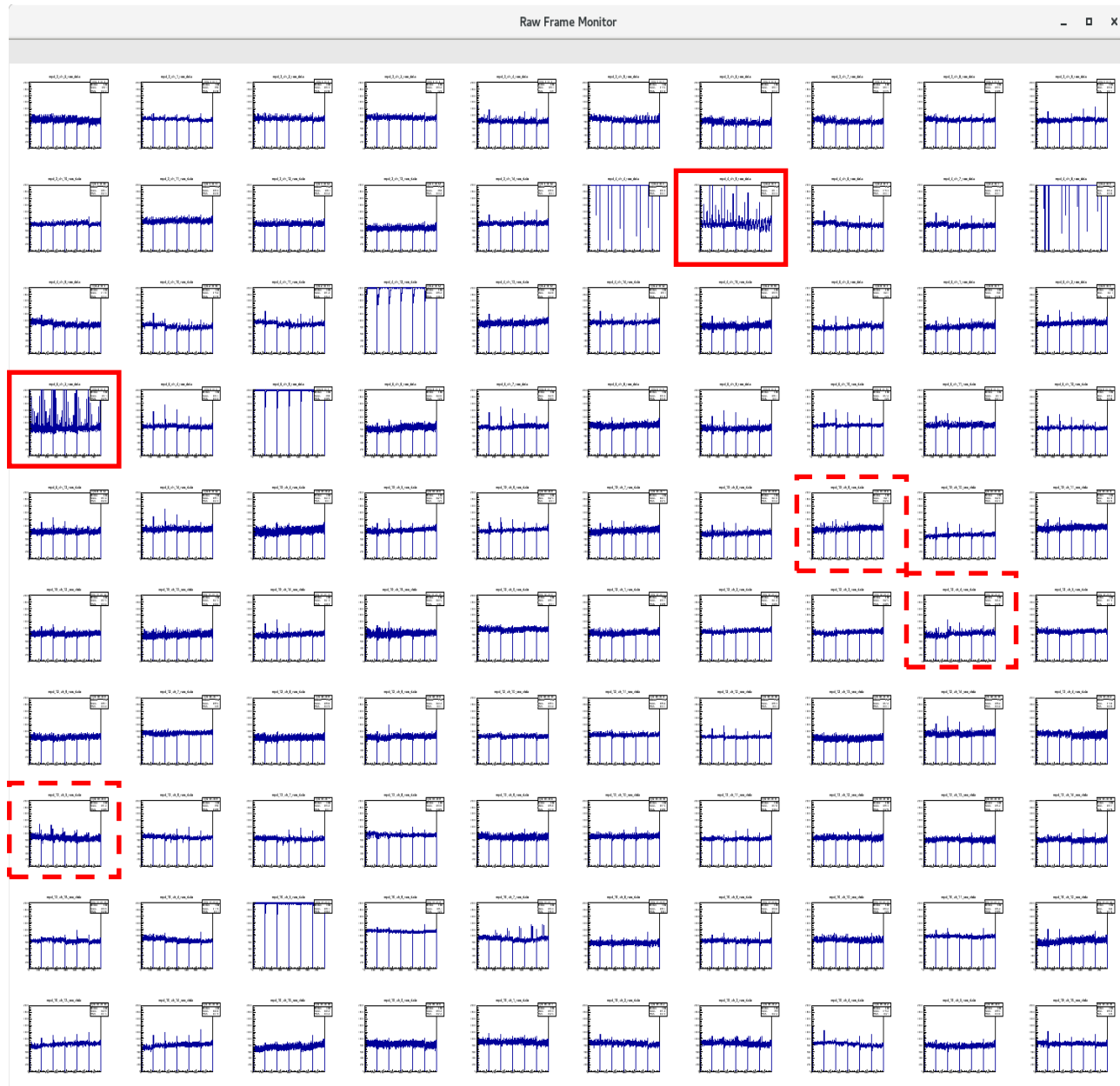
- some other were masked
- Just plots the first 100

- Typical good APV frame with no signal
- Typical good APV frames with cosmic signal
- Not connected MPD channel
- BAD APV (maybe connection or problems with the FE cards)

Raw data display of one cosmic event with signal in a few APVs

In principle for each cosmic event, we should expect at least 6 APV frames with signal

Here we can clearly see 2 and guess signal 3 other frames



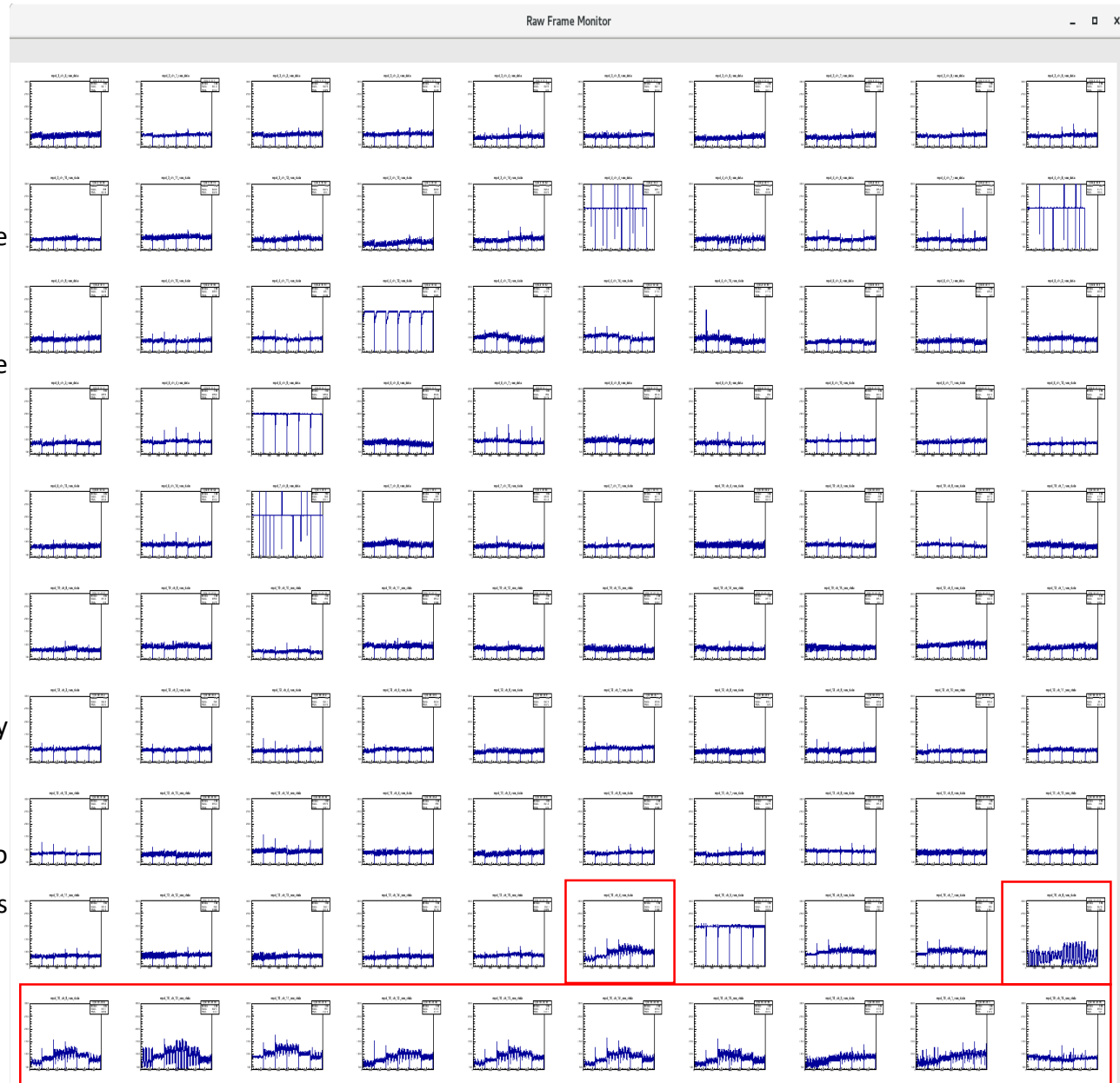
Another cosmic event with signal in a few APVs



Same here:

Here we can clearly see 2 but it is difficult to say if all 3 chambers have signal or efficiency issues

A good number of APVs with serious noise issue



This set of APVs are noisy and with the baseline position moving to much.

This is a situation that we have experience with at UVa

- Either a grounding issue
- Or disconnected strips
- Or broken strips
- Need to be investigated but not an easy task

With this situation, it will be very difficult to extract any good data with the chambers connected to it

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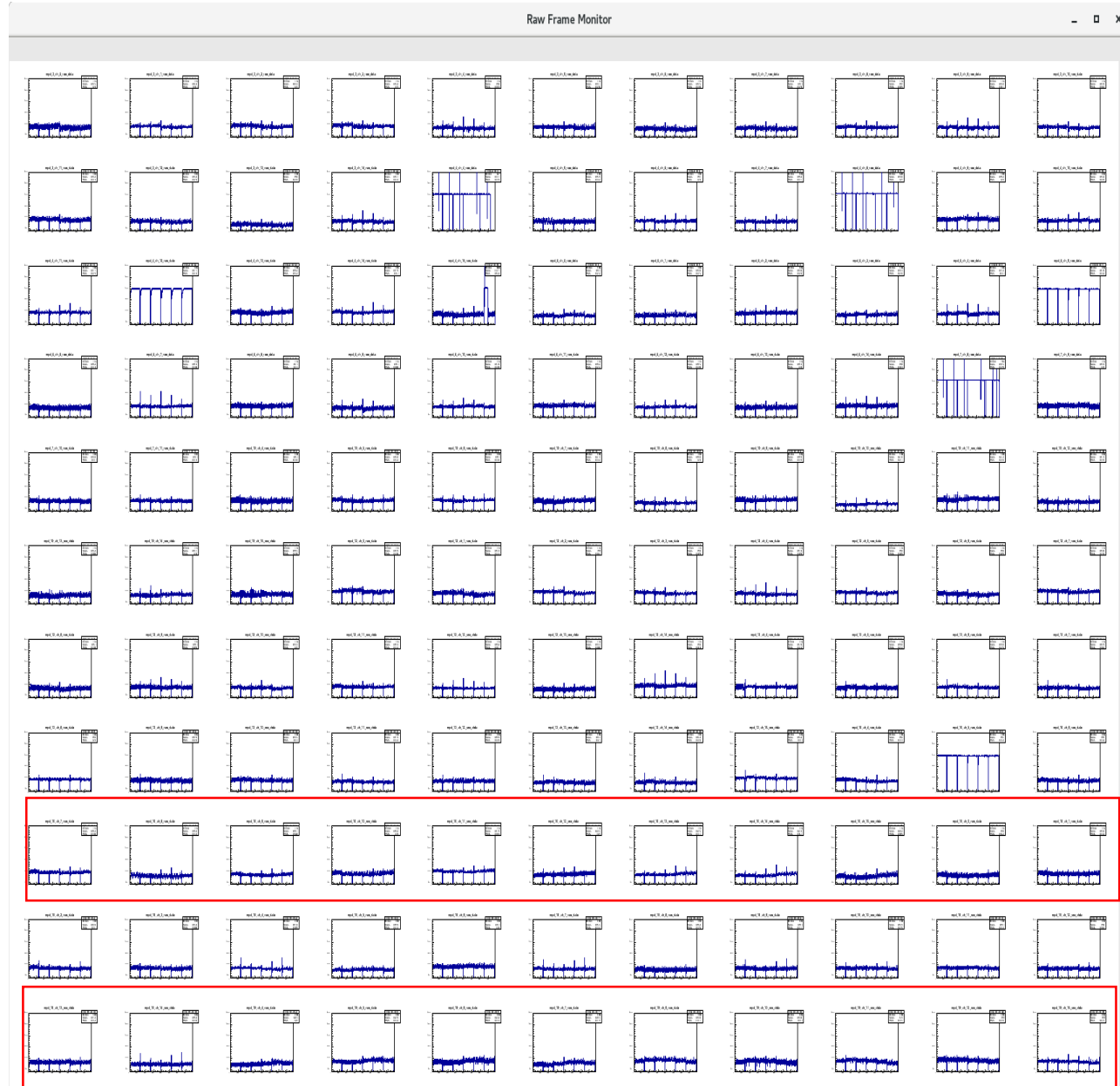
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A good number of APVs with serious noise issue

Here is an event with the **same set of APVs** **are** behaving normally

But rate of event with the noisy behavior at least 30% ~ 40% is just too high to just discount these event from the analysis

It also is high to even get proper pedestal data from



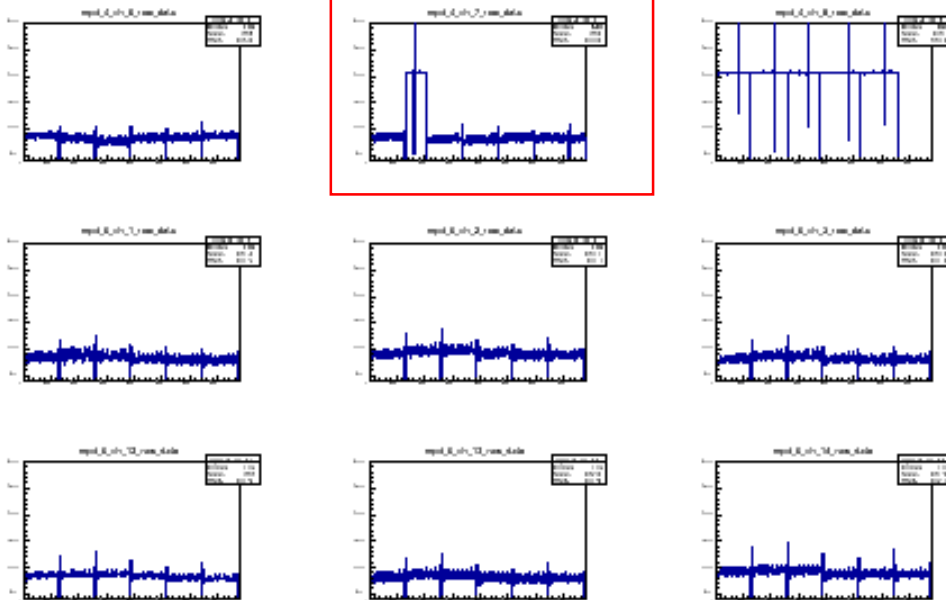
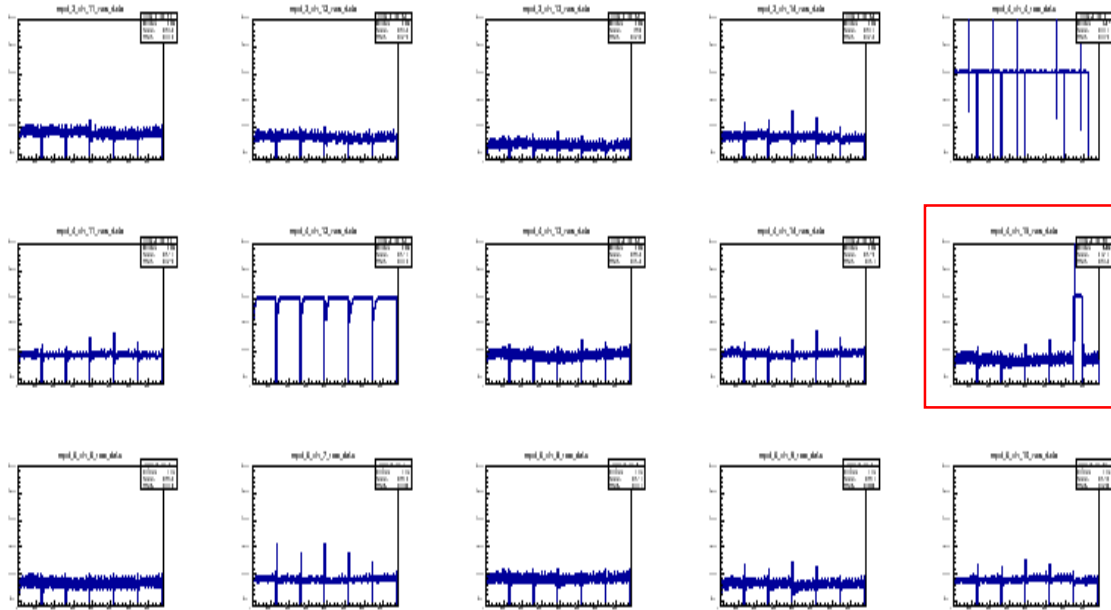
Another type of problem I am seeing with some APVs

This is another type of corrupted APV event that I don't really understand

This one happens at a lower frequency and affect generally few APVs (maximum 2) at the same time

We can deal with this by just throwing the APV data

But it is interesting to understand what is the cause of these problem



Summary of last week (May 15) activities

Status of INFN GEM commissioning

- We are seeing cosmic signal in the chambers
- But there are a few issues that need to be understood while we are taking large statistic of cosmic
 - A large subset of APV with high noise and large fluctuation of the baseline \Rightarrow will be difficult to get good data out without fixing this problem
 - A few APVs with corrupted data \Rightarrow but this happens with very few APVs for a given event and also at a lower frequency. We can leave with it for but need to understand the source of the problem
 - First look at raw data suggest that we might also have a problem with efficiency but these can be only clearly establish with a good decoder and analysis tool
- We need to get this tool from Siyu the sooner the better
 - Tool already existed and tested at UVa, just some small fixes needed to make it compatible with the Test lab Clean room DAQ setup
- This week we will start accumulating cosmic data despite of all these issues reported