INFN GEM Commissioning: Summary of last week (May 15) activities

A few major problems on the MPD readout were fixed

- I reported last week problems with two MPDs (MPD7 and MPD9) ⇨
  - **MPD7 is completely fixed** ⇨ problem was one digital HDMI cable was broken, was replaced
    - Now 10/12 APVs connected are configured properly, **known issue for the other two:** we are using an older version of the flex back plane ⇨ one-to-one connection between long and short HDMI using adapter means that 2 i2C line are not recognized
  - **Fixes for MPD9 as well:** One back plane was causing all the unstable behavior ⇨ This back plane is masked
    - 10 / 15 working properly (other 5 masked with the back planes
    - **Will specifically investigate this back plane this week**
- Issues with noisy APV channels reported last week has disappear
  - Don't know exactly what was the cause of these noisy APVs and how they are fixed now
  - The large noise on these APVs disappear as soon as I fixed these two MPDs even though the noisy APVs were coming from different MPDs and different GEM layers
- Current status of the readout for the 3 GEM layers:
  - **156 APVs** frames are being recognized by the DAQ out of a total **162** (18 APVs/ chambers for 9 chambers)
    - Because 5 are masked (MPD9) and one APV is not recognized at all (on MP19)
  - Out of the 156 APVs read out, 8 are not sending good data in the current configuration
    - 4 are not configured due to use of older flex back plane (MPD4 and MPD7)
    - 4 other are simply not working

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APV not configured (red boxes) older flex back plane)

APV not working (green boxes)

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Good event # 35 with plenty of signal

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Where do we stand?

- Issue with the gas regulator was confirmed and checked with the replaced regulator
- HV at 3950 V on all 9 chambers, has been holding very well with no specific issue
  - Took a run of 30K event on Friday afternoon with the current working DAQ
  - Will continue the run to accumulate more data, then will perform a quick HV scan

- We need a more efficient decoder / analysis
  - Really not possible to go further in term of studying the GEM modules with the current code
  - We can just make sure that the electronics is working properly with the current situation but even this need to be done in a better way
  - **We need to be able to produce pedestal data, perform zero suppression on cosmic data, 1D hit and cluster plots, 2D cluster position, 2D spatial gain uniformity, ADC distribution, efficiency plots ….**
  - **I don’t have time to work on this but I can supervise a student working on this because I have a pretty good idea of what is needed and how to do it**
  - **We should make this a priority otherwise we will waste too much time with the commissioning for both INFN and UVa chambers**

UVa GEM Commissioning: Summary of last week (May 15) activities

Activities in the EEL Clean room

⇨ See Siyu's report

Structure for the UVa GEM cosmic stand

- Still working on it, will complete by next week ⇨ will talk to Jessie Butler and/or Walt Akers for safety consideration
- Would need about 12 × 10' beams and about 8 × 6' beams + all the additional hardware for strengthen the structure
- Chuck to check availability of the Unistrut beams and if not will contact local vendor for price

Will move Danning's DAQ setup + 5 UVa GEM modules to EEL Clean room

- Discuss with Mark, will have the rack with our VME crate, NIM crate + NIM modules and HV PS for the Scint/PMT
- Chuck is preparing the Scint / PMT HV PS and will also put the rack on wheel for us
- Chuck will also provide a good regulator and support for the gas bottle
- Will also move the 5 UVa GEM modules to the clean room as well as the cabinet where we have some of our MPD modules