

INFN GEM Update:

Hardware Update

11/18/20-11/23/20

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Recent Activities at JLab:

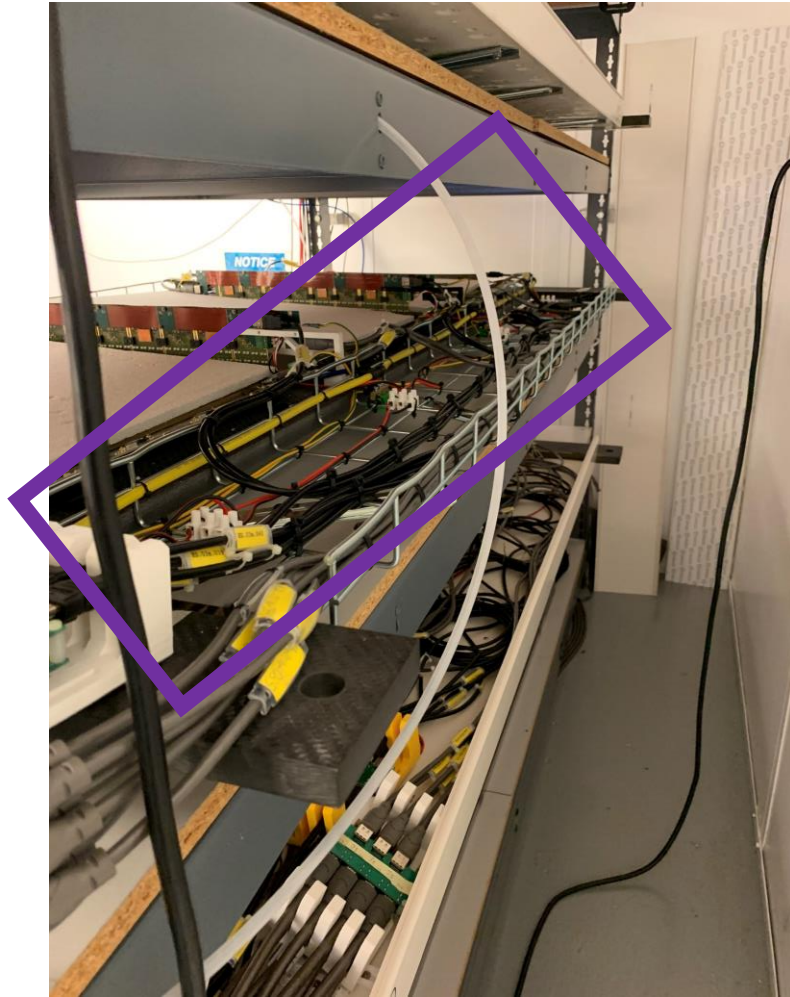
- Hardware (Nov. 18-19)

- Completed cable tray replacement for chamber J0 on the door side. Low Level Histo Test passed. Pedestal plots still being investigated.
- Started cable tray replacement for chamber J2 on the DAQ side.

- Hardware (Nov. 23)

- Completed cable tray replacement for chamber J2 on the DAQ side. Low Level Histo Test passed. Pedestal plots indicate maybe a few noisy or poorly connected APV cards.
- Reconnected some APV cards for MPDs 3 and 5, connected to chamber J0.
- Checked HV divider for lowest module on J4. The divider is not the problem.

Cable Trays Replacement Progress (Nov. 19)



- Replaced door side cable tray for chamber J0, plastic to metal.
- Reconnected all cables and tied cables in place with cable ties.
- This cable tray contains cables for electronics connected to MPDs 3-6.
- Checked multiple iterations of Low Level Histo Plots (Amplitude vs ADC value) and unplug/replug cables until plots show nominal behavior.
- Investigating Pedestal plots (Run 186-188), most individual plots looked similar to previous pedestals under similar conditions. Conditions: HV= 0 V, N2 flushing, ~3000 events.
- There are a few noisier cards on each MPD for MPDs 3-6. These are actually due to a problem with the connection between Kapton Fingers and the APV card. I looked at a few of the connections.
- Conclusion, this cable tray replacement was successful. But we need to fix these Finger-Card disconnection which occurred during the replacement.
- Serves as a learning experience for me in replacing cable trays.

From top to bottom door side: J4 (metal and not pictured), J3 (plastic), J0 (metal), J2 (plastic).
Priority is J0 and J2, since best chambers

Cable Trays Replacement Progress (Nov. 23)



From top to bottom DAQ side: J4 (metal), J3 (plastic), J0 (metal), J2 (metal). Priority is J0 and J2, since best chambers

- Replaced DAQ side cable tray for chamber J2, plastic to metal.
- Reconnected all cables and tied cables in place with cable ties.
- This cable tray contains cables for electronics connected to MPDs 11-14.
- Checked multiple iterations of Low Level Histo Plots (Amplitude vs ADC value) and unplug/replug cables until plots show nominal behavior.
- Investigating Pedestal plots (Run 189-193), most individual plots looked similar to previous pedestals under similar conditions. Conditions: HV= 0 V, N2 flushing, ~3000 events.
- There are a few noisier cards on each MPD for MPDs 11-14. These are most likely a connection issue between Kapton Fingers and the APV card.
- Conclusion, this cable tray replacement was successful. But we need to fix any Finger-Card disconnection which occurred during the replacement.

What to do next?

- Hardware:
 - Finish changing plastic cable trays to metal cable trays for chamber J2. Once change is complete, for each cable tray verify Low Level Histograms and Pedestal RMS plots.
 - Systematic check of noisy cards for all chambers. Particularly we already know the last card on MPD 8 needs reconnecting and we need to reconnect certain noisy cards of chamber J0 and J2.
 - Start building the GEM frame this week.
- Data Analysis:
 - Finish optimizing alignment parameters for INFN config in SBS offline analyzer (Andrew's Code).
 - Once properly aligned, reanalyze recent data with SBS offline analyzer.
 - Use the HV scan data to make a plot of Efficiency vs HV