

# INFN GEM Update:

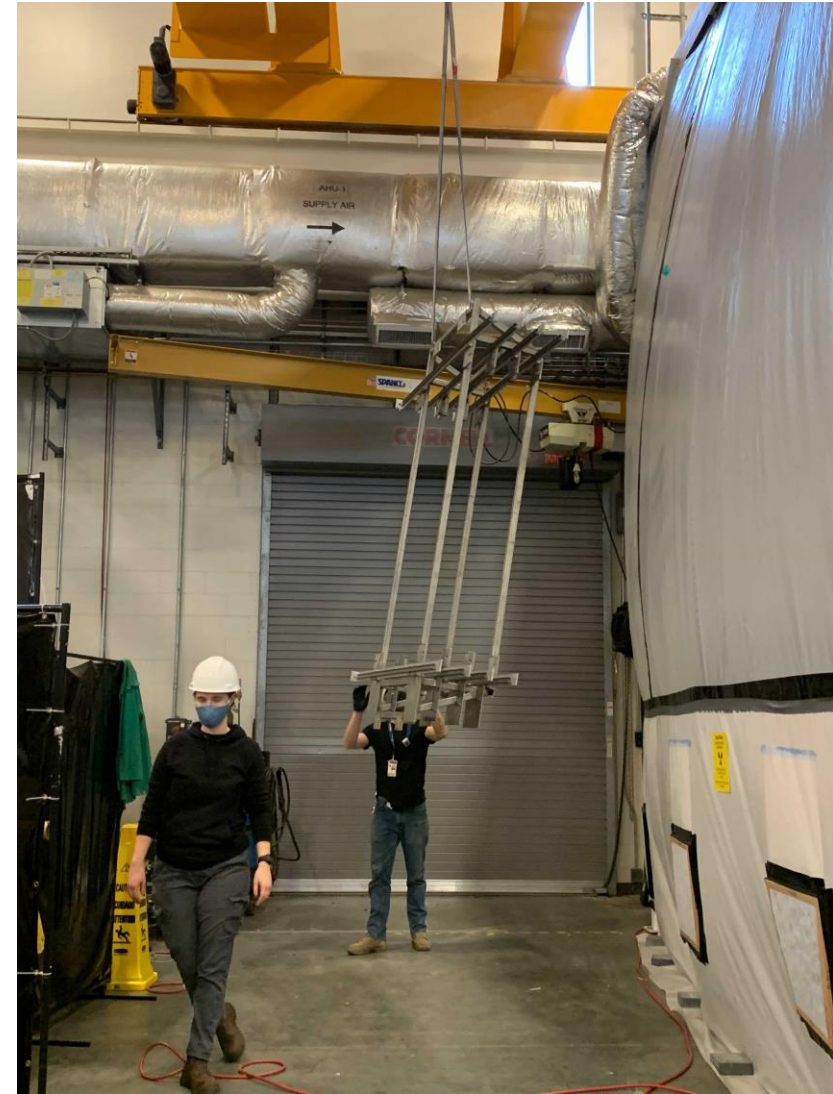
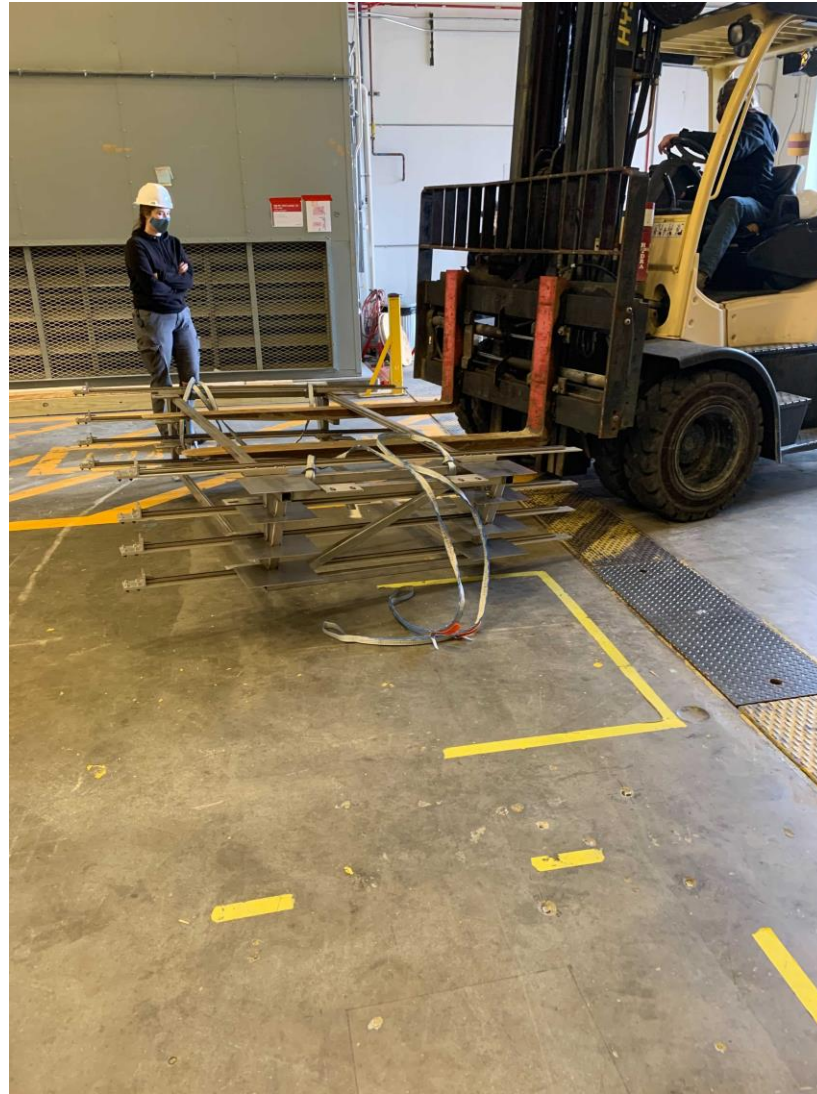
2/3/21-2/10/21

Ezekiel Wertz (onsite), Robert Perrino(remote), Evaristo Cisbani (remote), Holly Szumila-Vance (onsite), Chuck Long (onsite)

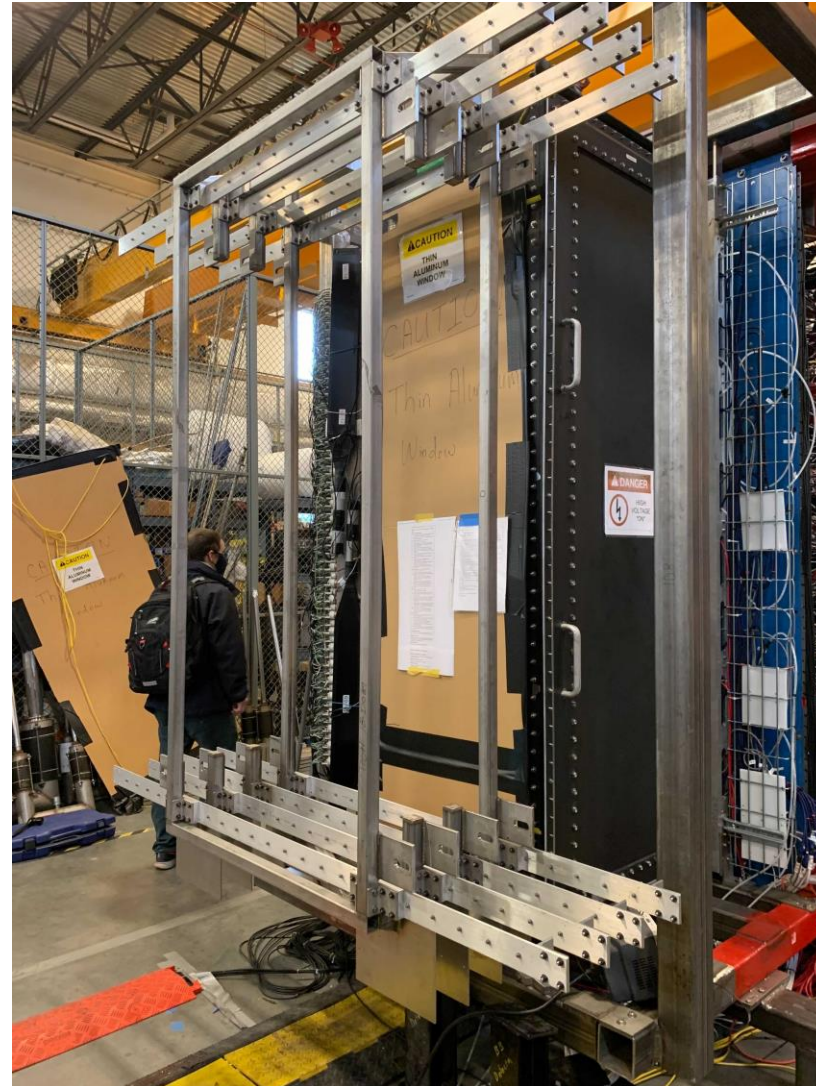
## Recent Activities:

- Hardware (Feb. 3-4)
  - BigBite GEM frame installed on front of BigBite Detector
  - Started preparing TEDF for GEMs, moved 10 cable mats and laid fiber optic cable
  - Started taking cosmic data at HV=3900 V and 4000 V.
- Cosmic Data (Feb. 3-8)
  - DAQ/Electronics unstable. From Hit Maps, problems on MPDs 7 and 15.
  - Strange error for MPD 16 over the weekend, Monday MPD 16 is fine.
- Hardware (Feb. 8)
  - Troubleshooting MPD 7 and 15. Checked and adjusted LV for chamber J3. Found backplane on MPD 15 with missing capacitors, replaced backplane. Power cycled LV source and VME crate.

# BigBite GEM frame Install on BigBite Detector, Feb. 3



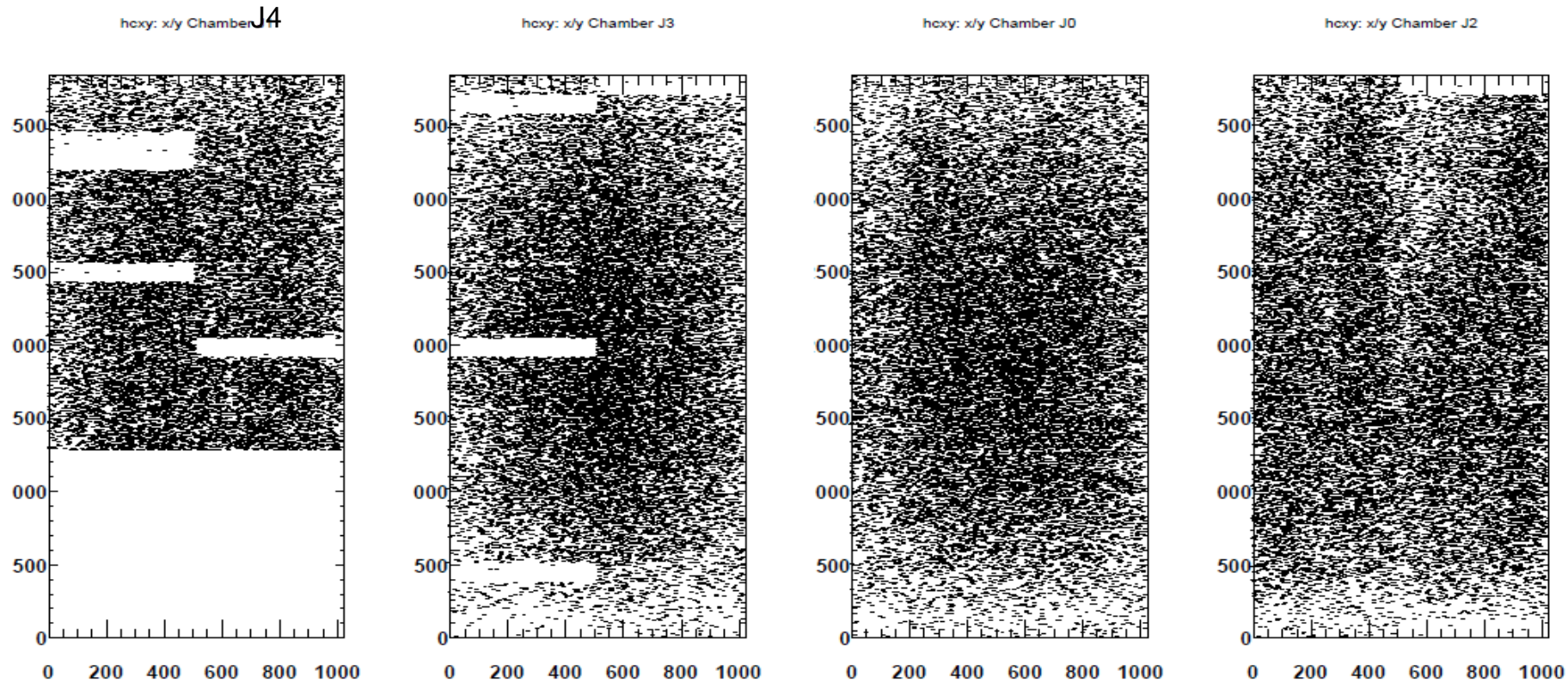
# BigBite GEM frame Install on BigBite Detector, Feb. 3



# What we expect: Hit Map (Cosmic run 156) Nov 10

(statistics: ~ last 30000 events)  
AR/CO2 gas flow ~ 1/2 of "nominal" values  
HV = 4150V

*NOTE: use  
pedestal 142  
at HV=4000 V*

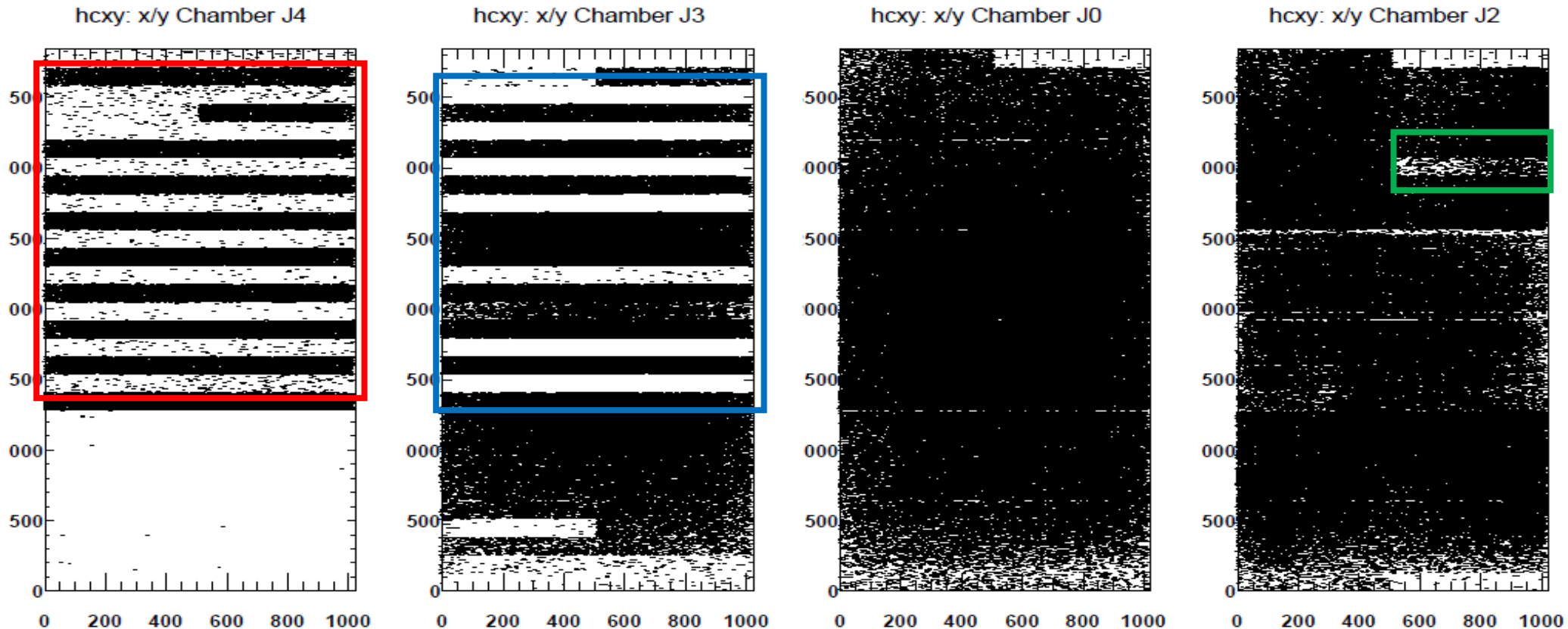


# Preliminary: Hit Map (Cosmic run 392) Feb.3

(statistics: ~ first 298489 events)  
AR/CO2 gas flow ~ "nominal" values  
HV = 4000V

*NOTE: use  
pedestal 381  
at HV=0V*

Red: Most likely issue with DAQ/electronics for MPD 7.  
Blue: Most likely issue with DAQ/electronics for MPD 15.  
Green: Poorly soldered resistor which usually recovers once HV is on for a bit

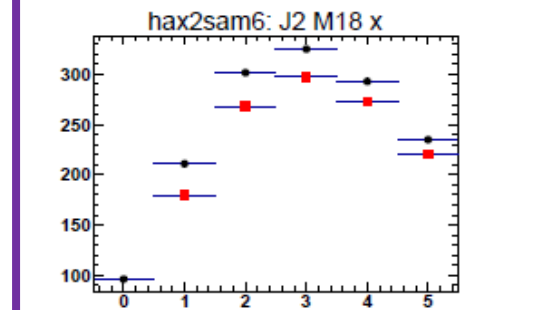
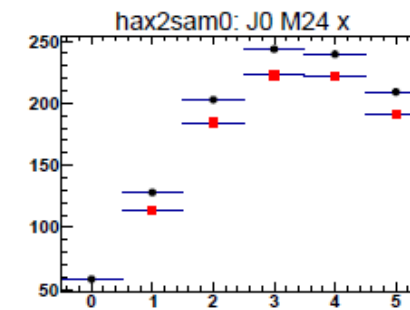
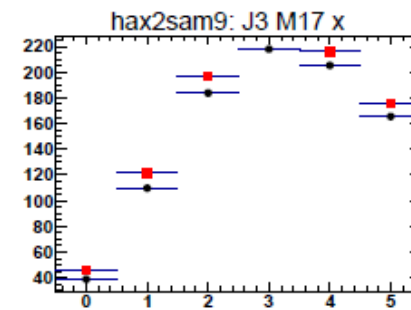
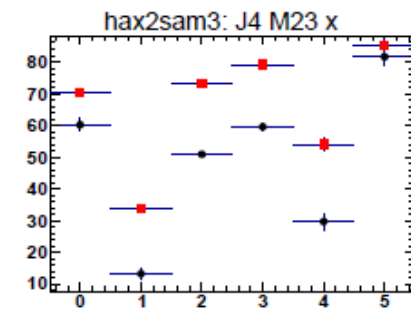
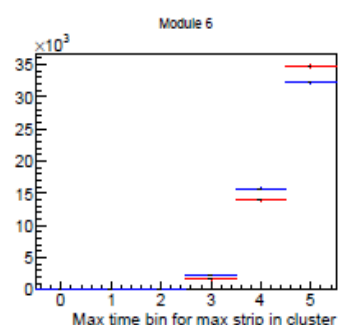
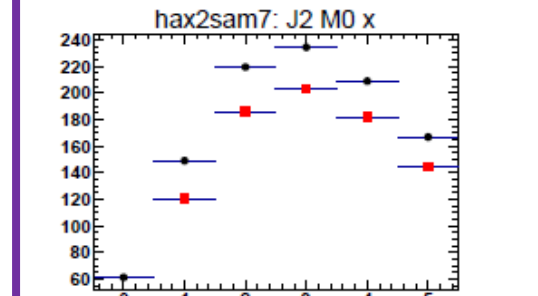
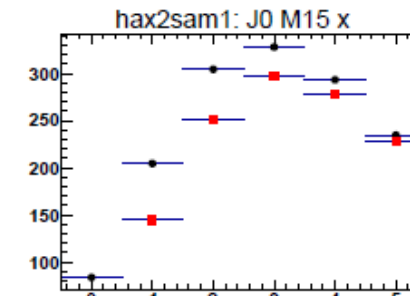
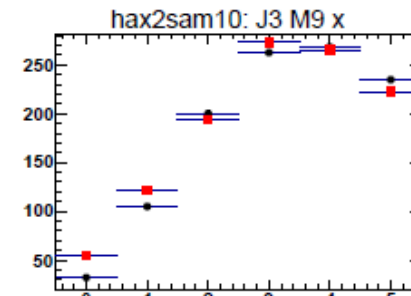
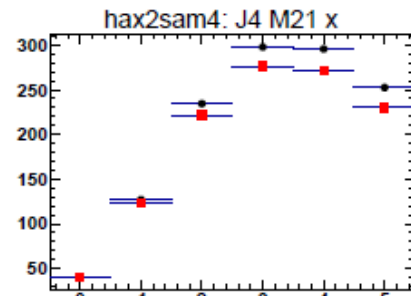
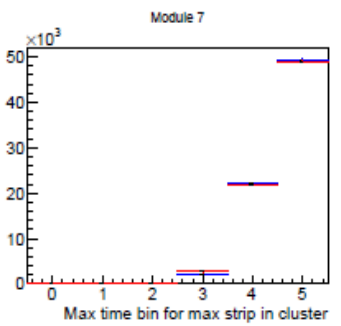
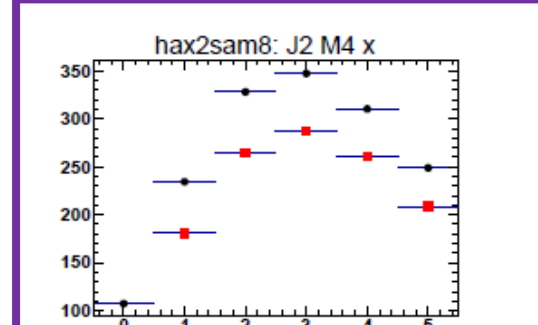
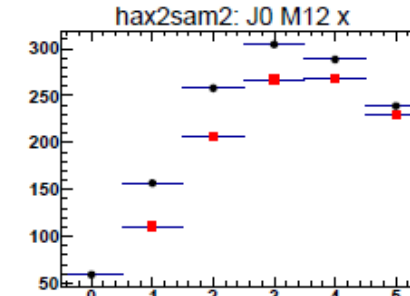
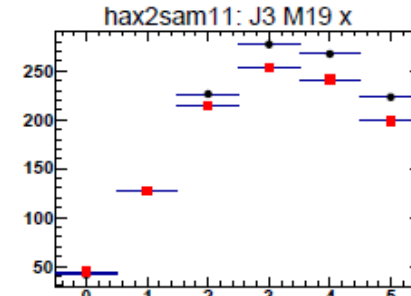
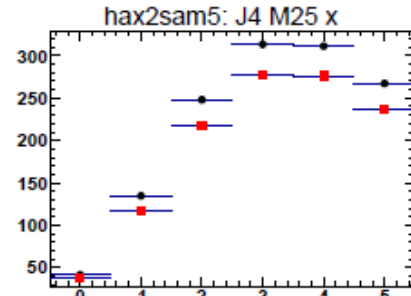
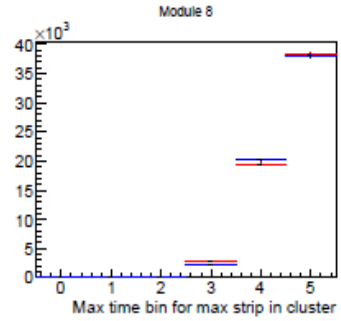


For Red and Blue, odd part is that neither DAQ nor Low Level Histograms give errors.

# Latency Plot J2 Before/After:

Before: From  
run # 141

After: From  
run # 392



# What to do next?

- GEM Chambers
  - Figure out problems with J4 and J3, possibly linked to MPDs 7 and 15.
  - Create better transportation supports and overhang for cart
  - Cosmic Run check and latency scan
  - If cosmic data is good, prepare TEDF for moving of 2 GEM chambers: J0 and J2
- BigBite GEM Frame
  - Test  $\frac{1}{4}$ " spacers on first position of BigBite frame.
  - Fashion material to be attached to frame to protect GEM modules
  - Vertically test GEM frames and realistic chamber, before moving chambers
- Data Analysis:
  - Analyze recent cosmic data
  - Evaristo adjust macro for determining average efficiencies to remove dead areas
  - Understand Andrew's alignment process vs my own.