Status of SBS Hadron-Calorimeter (HCAL)

Jiwan Poudel
Jefferson Lab

Hall A Collaboration Meeting
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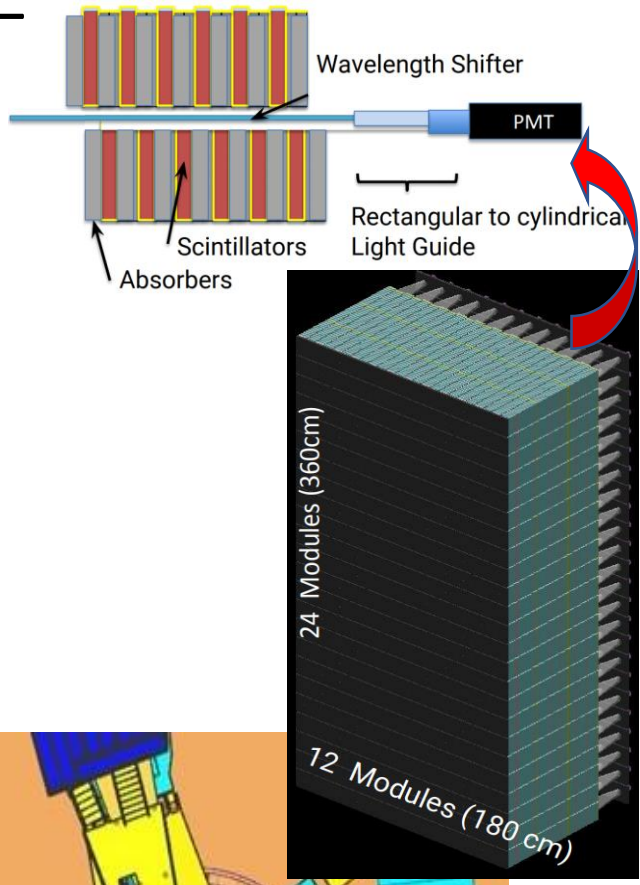
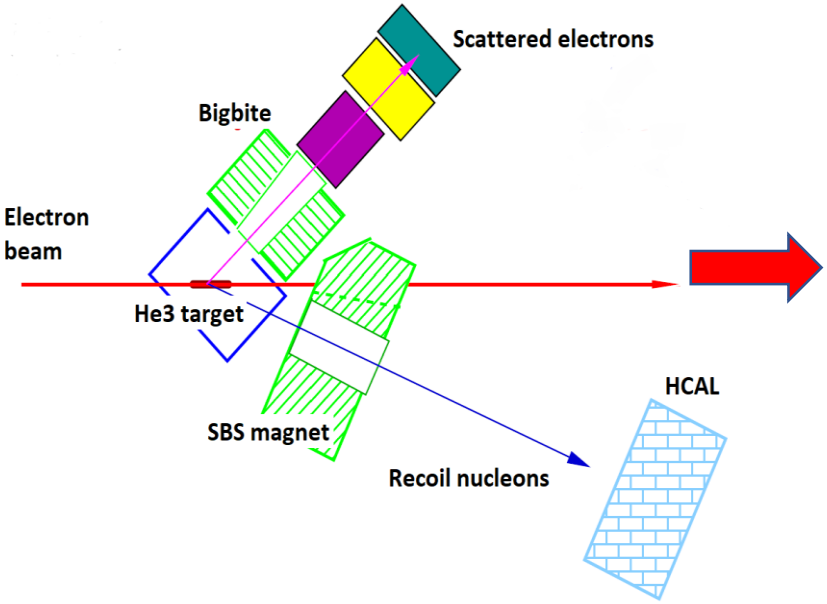
Overview of HCAL

- Hadron detector towards SBS-arm
- Segmented Calorimeter to detect high energy nucleons
- 288 modules (12x24)
- 40 layers of Iron absorbers alternate with scintillators in each module
- Proton/neutron separation by SBS magnetic field





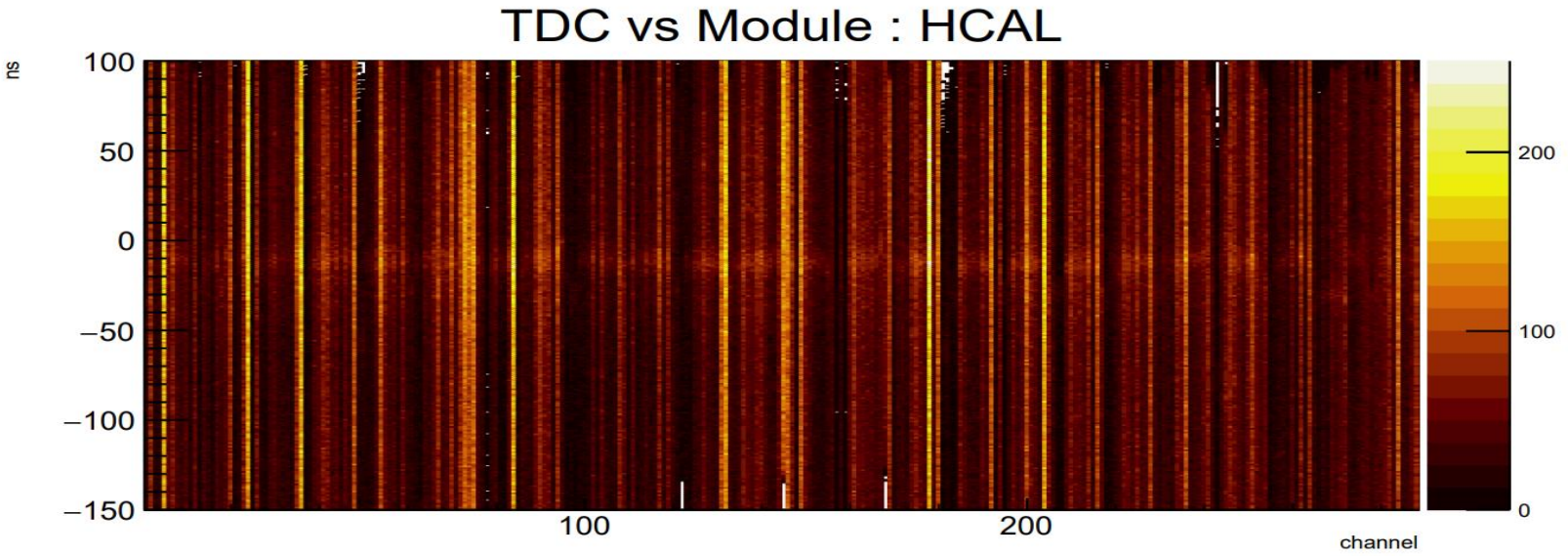
HCAL Data Acquisition

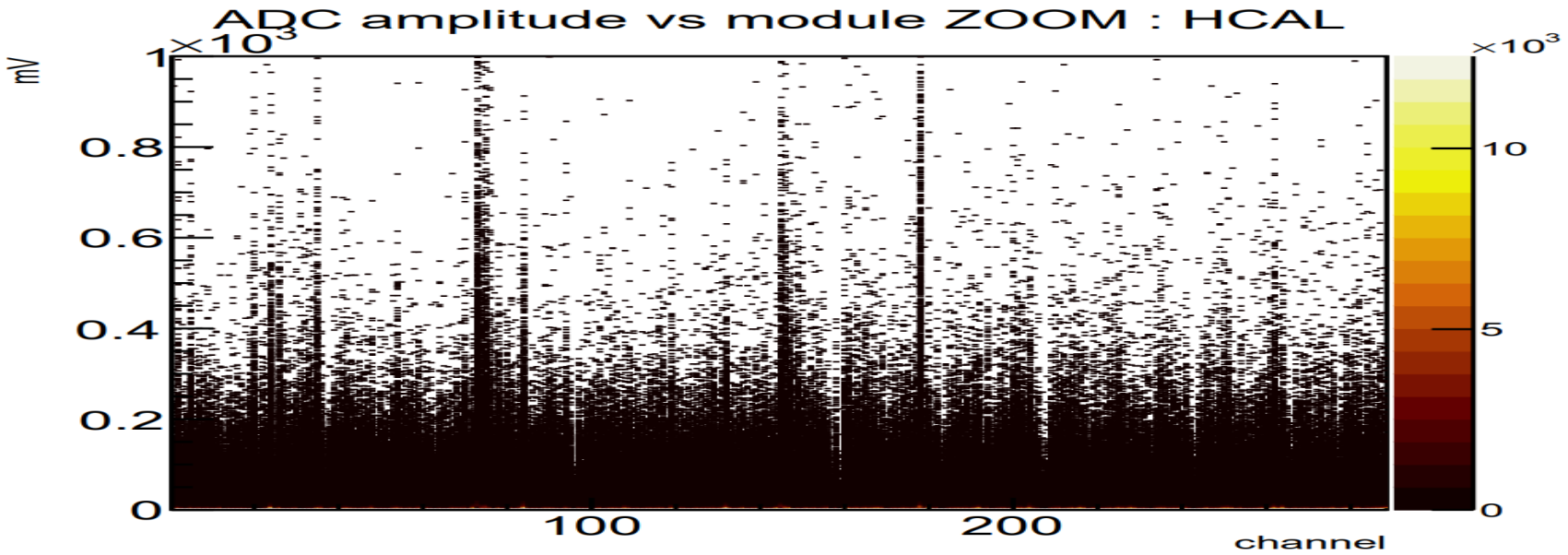
Both ADC and TDC are used to record HCAL data (2 cable lines from front-end to back-end)

- Front-End (hcal upper platform)
  - 10 x amplifier, fADC patch panel, TDC split panel
  - TDC discriminator
  - Summing modules (4x4 and then 8x8), Sum trigger discriminator
- Back-End (DAQ bunker)
  - fADC patch panel, fADC 250 in VXS crate
  - TDC discriminator, f1TDC in VXS crate

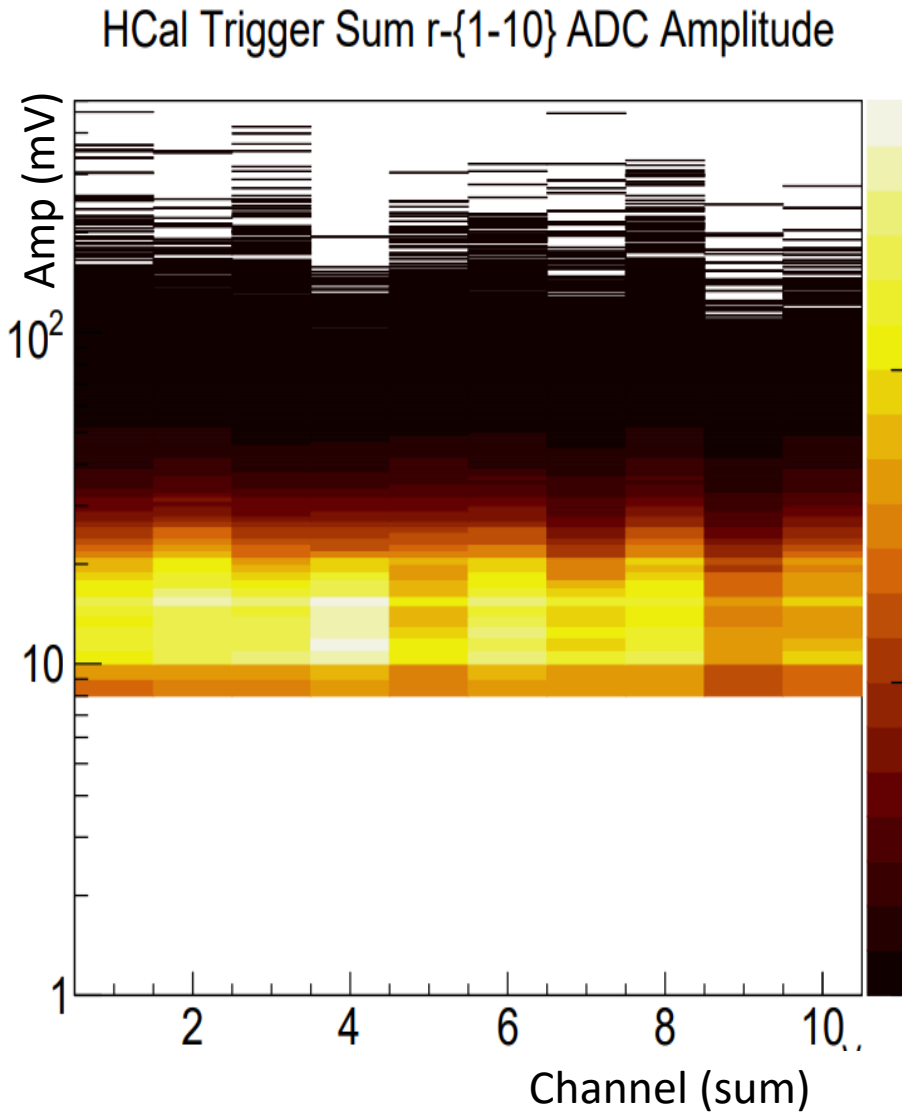
- Expectation
  - Time resolution ~1 ns
  - Energy resolution ~30%
  - Position resolution ~ 4cm

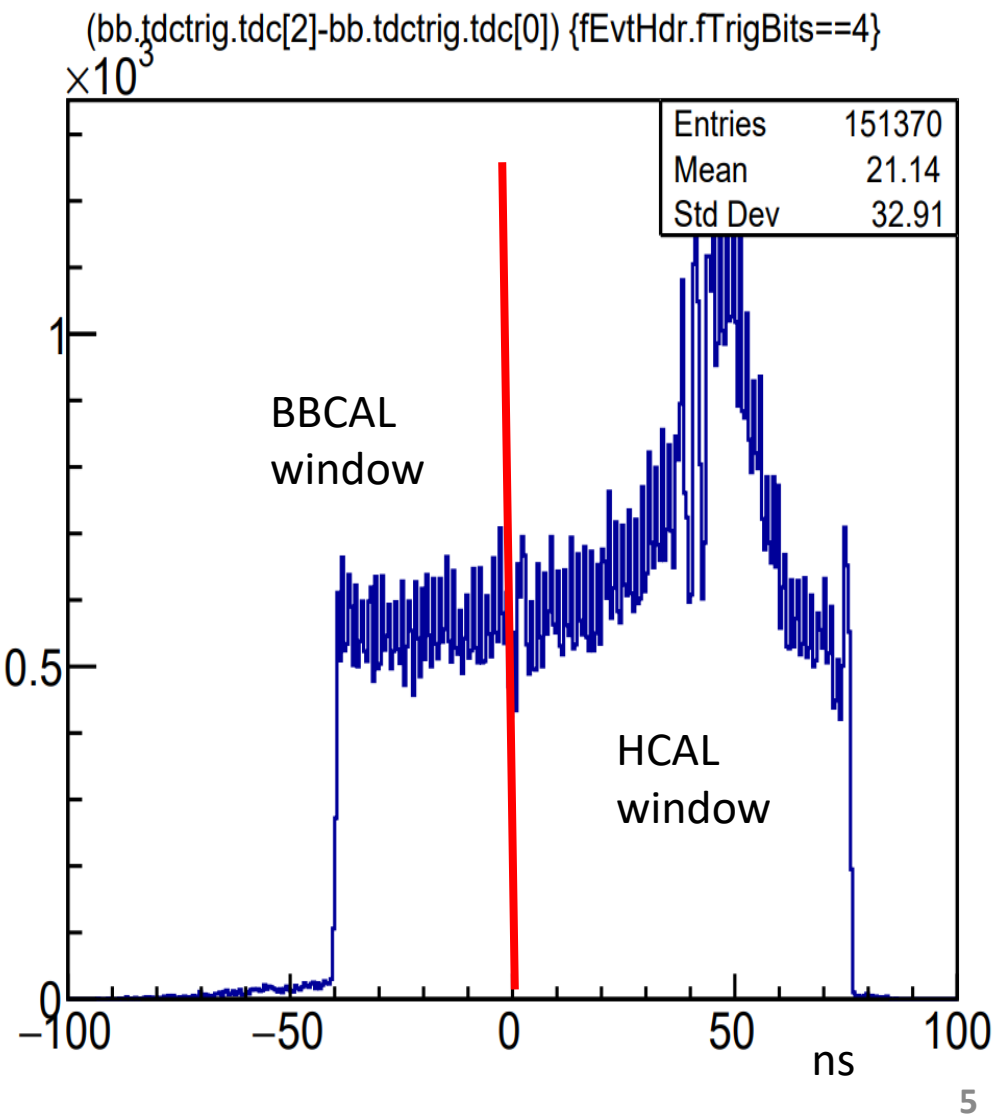
HCAL Data


TDC vs Module : HCAL
ns
100
50
0
−50
−100
−150
100
200
channel
200
100
0

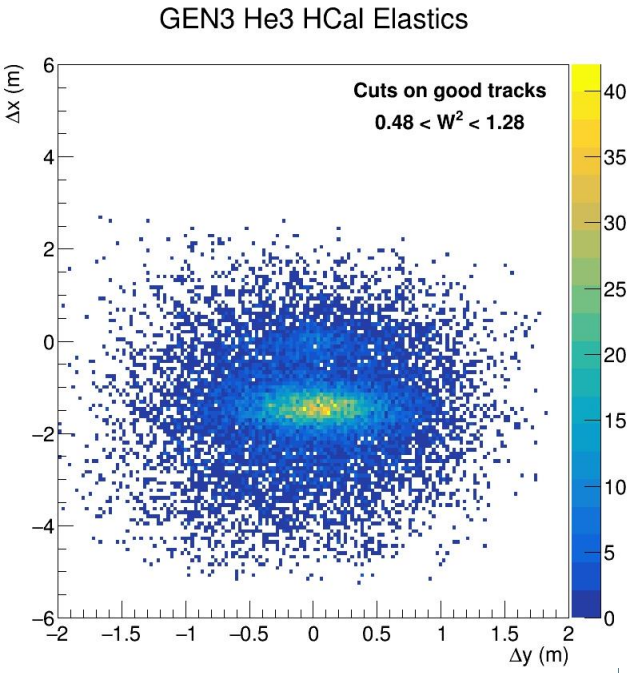

ADC amplitude vs module ZOOM : HCAL
mV
×10³
1
0.8
0.6
0.4
0.2
0
100
200
channel
×10³
10
5
0

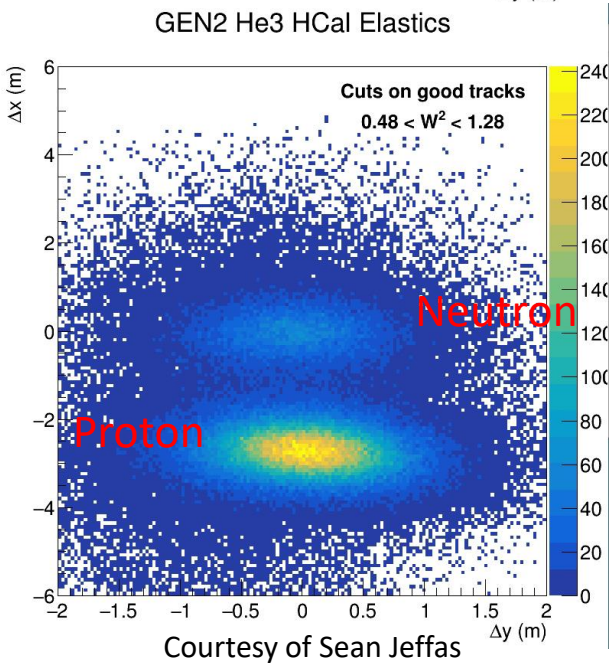
HCAL Trigger and Coincidence



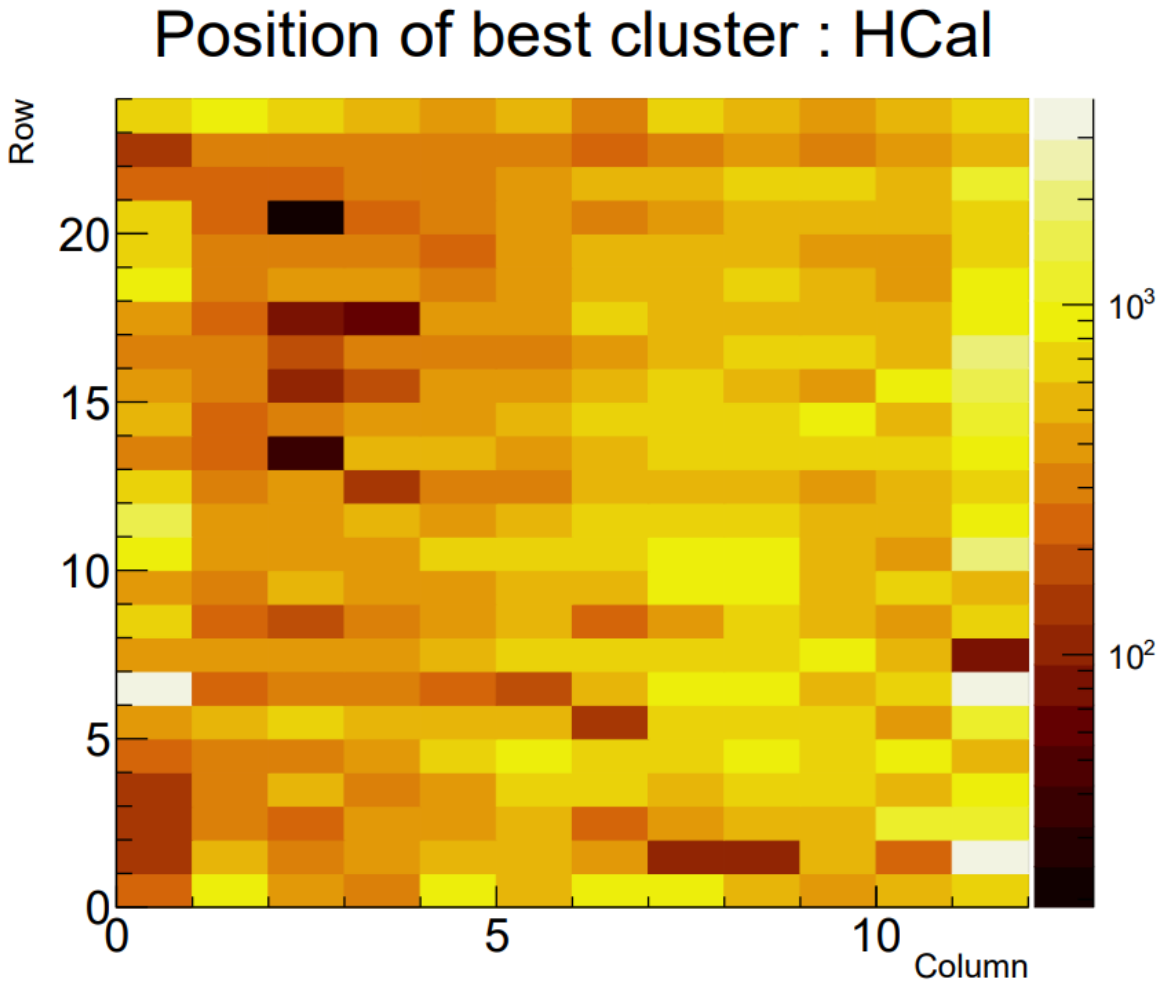


HCAL Data





Courtesy of Sean Jeffas

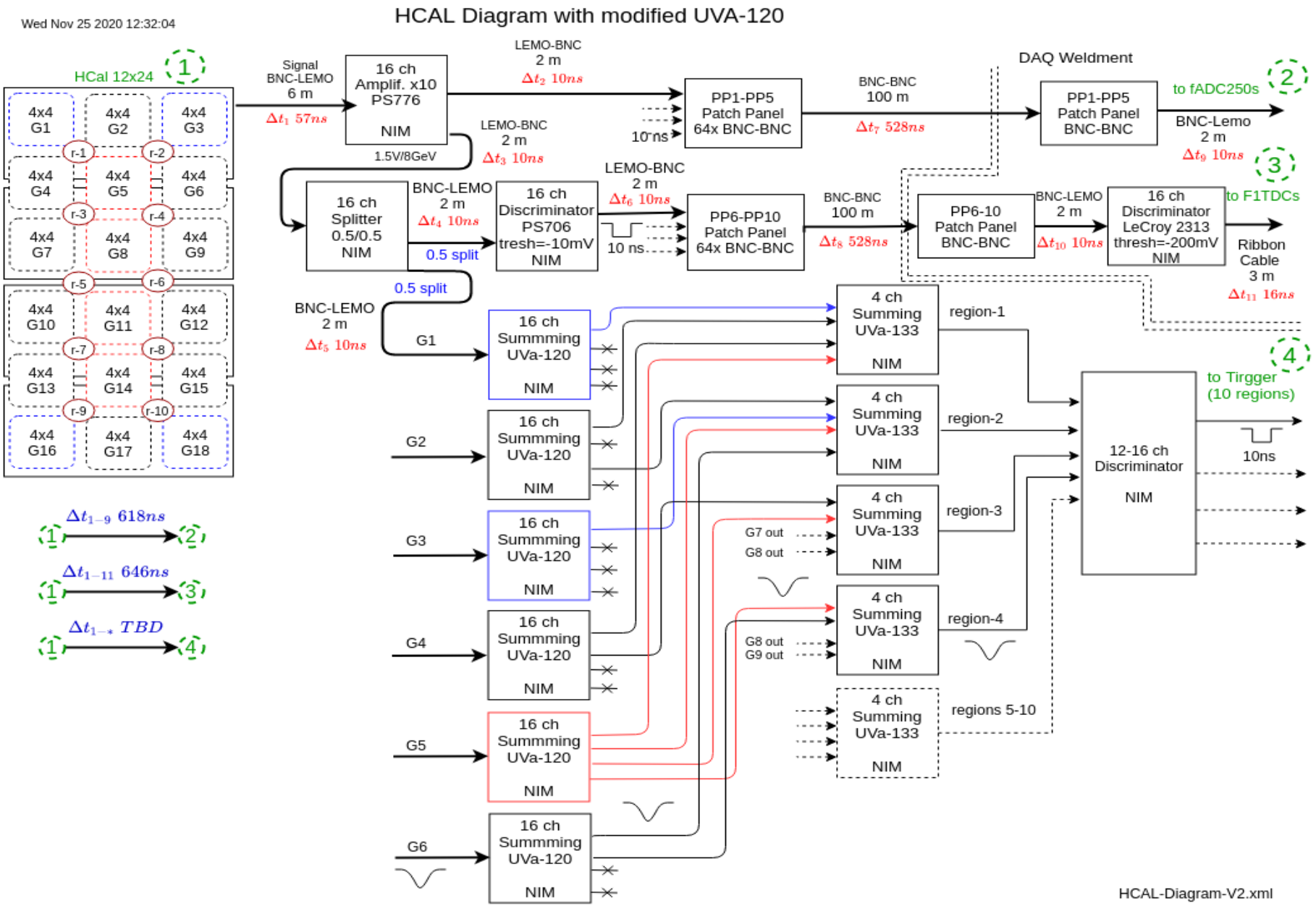


Summary

- All HCAL modules are in good shape and data looks fine
- Coincidence trigger between BBCAL and HCAL implemented during GEnII (some adjustment required during SAD)
- TDC data decoding is updated to remove double peaking, but further work is in progress to understand TDC data (missing)
- Work on energy calibration and time resolution is ongoing
- Expansion of hcal group merging HCAL+BBCAL groups (initiated with single ‘expert on call’ during GEnII)

Thank you

Back up



HCAL-Diagram-V2.xml