

# CDET UPDATE

SBS Weekly Meeting, 8/14/2024

# HARDWARE

- Module retrofitting – M1 finished, M6 in-progress, M2-5 on deck



Module 1



Module 6

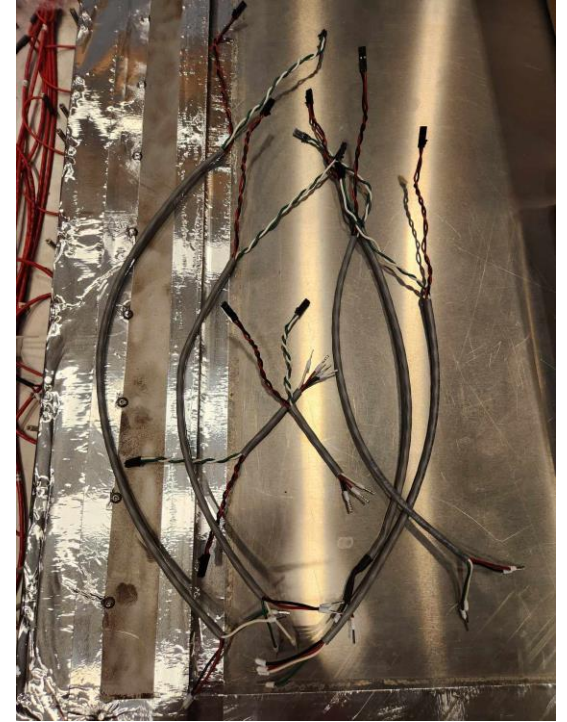


Modules 2-5



# CABLE MAKING

- High voltage (finished), Low Voltage (in-progress), TDC ribbon (in-progress)



# MOVING TO HALL A

- Starting this week, moving frame and all six modules
  - Meet with Lawrence, Robin, Don, and Mark J. to discuss cable routes on the floor
- Detector frame to be cut to fit down the Hall A ramp
- TDC repeater and long HV cables installed in Hall A
- DAQ crate also in Hall A but not installed
  - need to make (or find) robinson-nugent connector cables for TDC (have 13, but need 84 total)
- HV crate installed but need 2-3 more negative HV cards
- Recently determined route for TDC ribbon from top of HRS to the repeater (straight drop down)
  - in-progress for making these (have 44 left over from BBHodo & GRINCH, need to make 124 more)

# SOFTWARE & ANALYSIS

- half-module scripts used to finish ADC normalization and hv settings
- now have scripts for plotting individual modules & full detector, using cosmics data from half-module setup in the test lab
- used new scripts for cross-talk study between pixels in 4x4 maPMTs
  - results: avg.  $\sim 3.6\%$  cross-talk after applying ADC cuts, TDC width cut used to remove remaining cross-talk
- preliminary fits of TDC spectra from cosmics data yields avg.  $\sim 4.5$  ns timing resolution
  - fitting TDC spectra with Gaussian and using FWHM to calculate, no calibrations were used
  - previous simulations report 1 ns time resolution (Sarty, 2013)

# SOFTWARE AND ANALYSIS

- To-Do list for CDet software (copied from Andrew P.)
  - CDET: Peter and Ralph + student(s) + Ed Brash + GEp PhD student(s)?
    - Timing calibration--what timing resolution can we expect from CDET? Offline timing cuts
    - HV settings and adjustments
    - Gain matching/efficiency plateau --> HV scan (at low luminosity)
    - Need software to estimate CDET efficiency for elastic electrons
    - Calculating reaction plane angle and front tracker search region (together with ECAL)
    - Implement photon veto (offline)

# SOFTWARE PLAN

- first step – update CDet detector geometry in g4sbs and use simulation data to build CDet class structure
  - going to build from scratch, but using other detector code for guidance
- develop calibration code ahead of experiment start time, still building a list of which calibrations
- analysis of detector performance during production, and online replay plots for shift crew to use

**QUESTIONS?**