

## Detector Support Group

*We choose to do these things "not because they are easy, but because they are hard".*

**Weekly Report, 2024-03-20**

### Hall A – ECAL Test Stand

*Marc McMullen and Mindy Leffel*

- Fixed Boolean process variables not updating in LabVIEW VI
  - ★ All needed to be identified as Booleans in the EPICS shared variable records fields
- Started developing racks for controls equipment to be located in radiation shielding bunker
- Completed first power supply interface chassis and started wiring second chassis

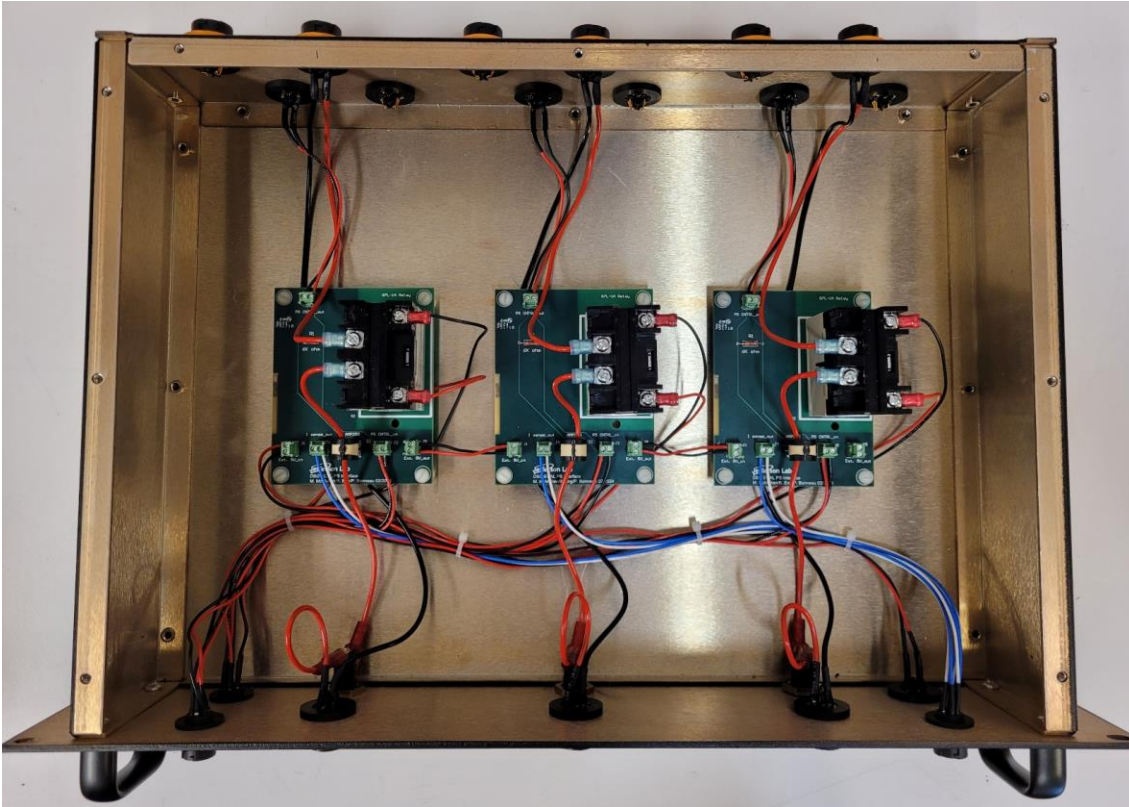
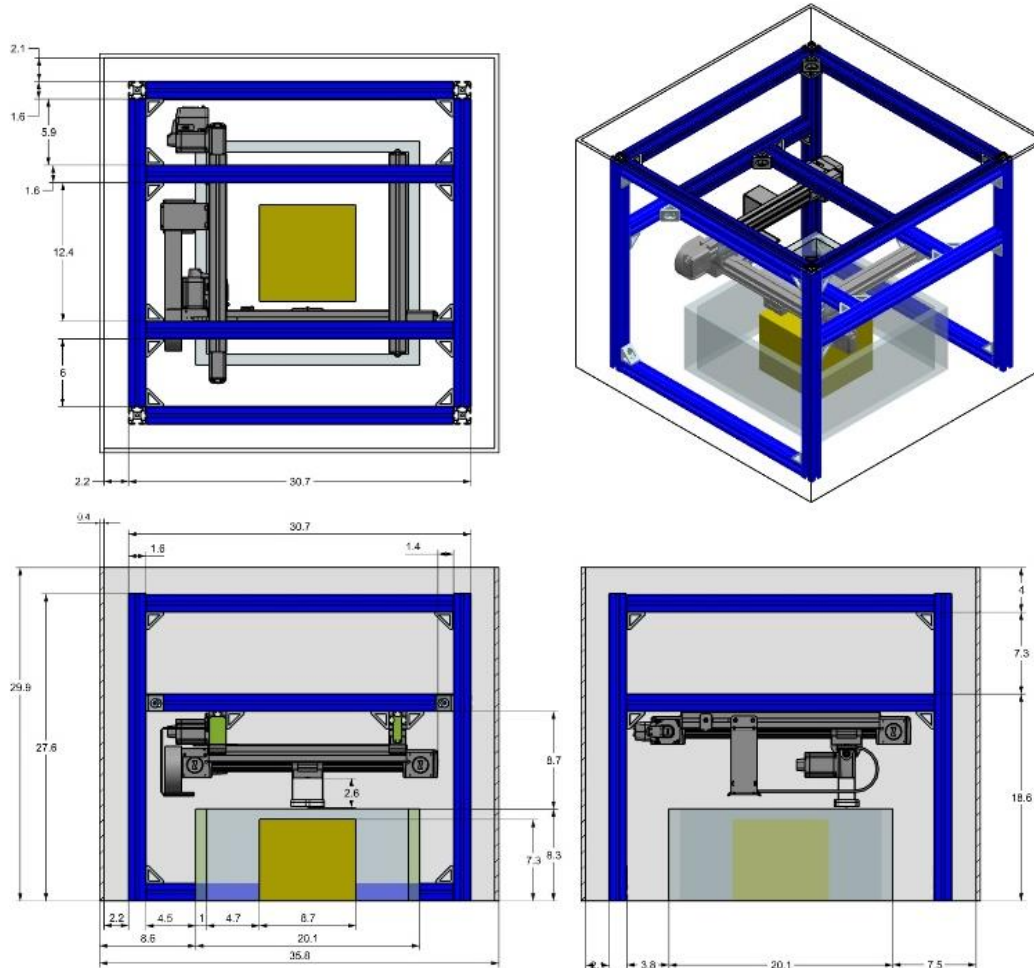


Photo of completed power supply interface chassis

## Hall A – LAPPD

*Pablo Campero and Marc McMullen*

- Completed update to support frame model using 27.5" extrusions
  - ★ Initial drawing used 26" extrusions



Third-angle projection of the gantry support using 27.7" aluminum extrusions

- Completed LED box design
- Printed LED support and cover

## Hall B Magnets

*Brian Eng*

- Troubleshooting Torus software quench (~20–35 A) when going from 0 A to full current
  - ★ 10-A steps from 0–60 A were okay, but fast dump when going to 100 A
  - ★ Noticed that VT6 was reading about half the voltage it should be
    - <https://logbooks.jlab.org/entry/4268525>
  - ★ No changes made before, during, or after controlled access, when it ramped to 500 A with no issues

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## Hall C – NPS

Aaron Brown and Mary Ann Antonioli

- Generating plots of front sensor temperatures for crystal 0 for 11/25/2023
  - ★ According to Carlos Munoz, their automated daily temperature plots use a calibration equation to correct for improperly wired thermocouples
    - $T_{\text{plot}} = (21.4122 - T_{\text{reading}}) + 20$
    - Equation applied to all sensors, regardless of whether incorrectly wired or not
  - ★ Equation caused discrepancy between the raw MYA plot and the calibrated plot
  - ★ Developing a Python program to plot both the uncalibrated and calibrated data for all sensors for 11/25 and 12/5 (uncalibrated data already posted to website)

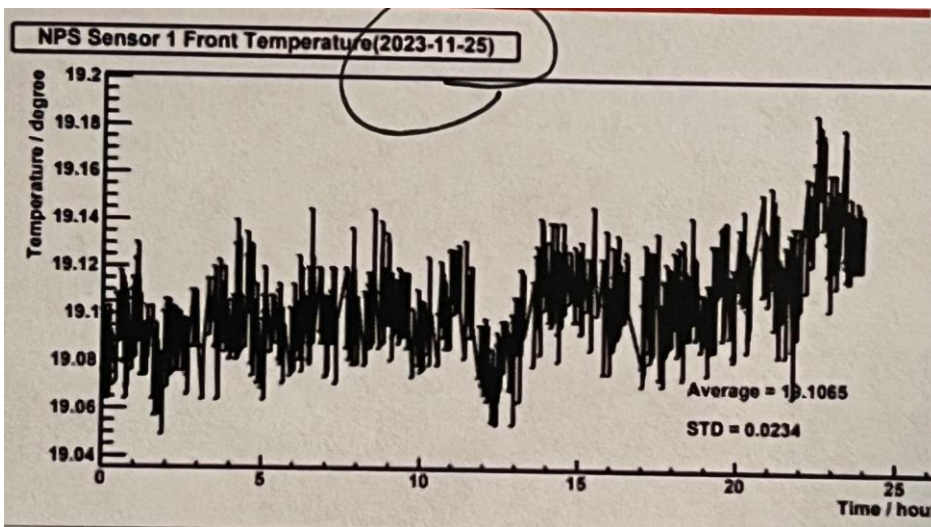
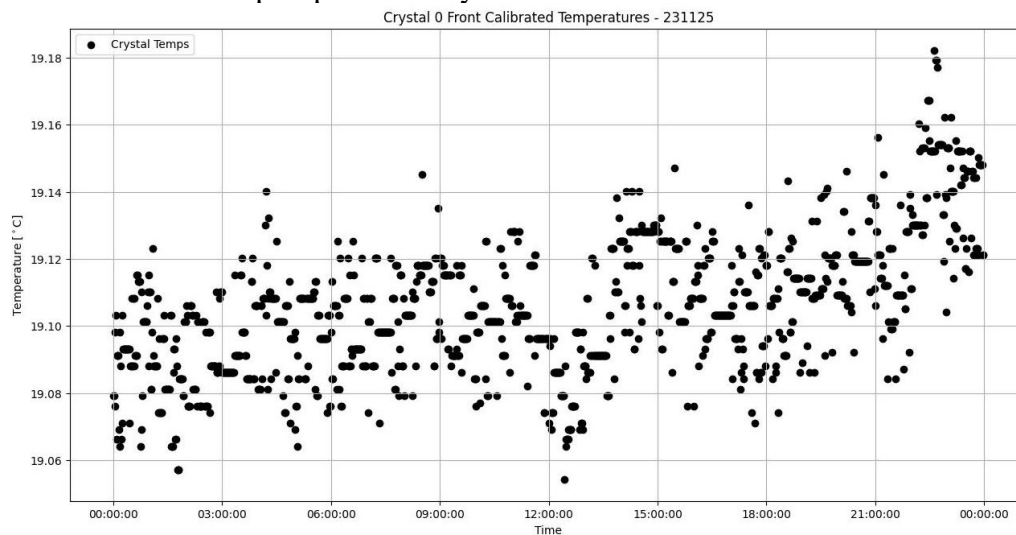


Photo of calibrated plot presented by Mark Jones



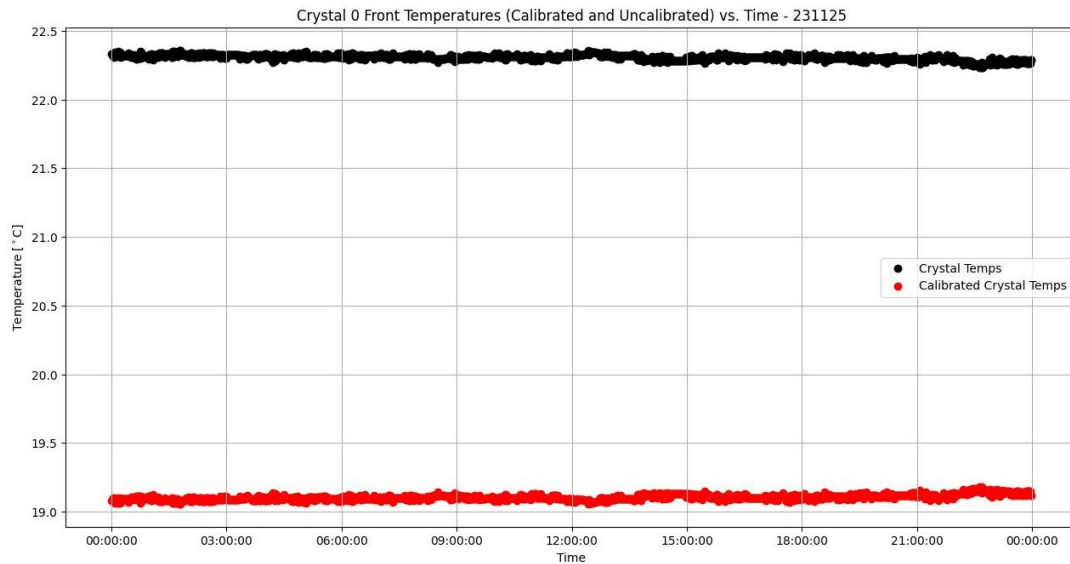
Calibrated plot by Aaron Brown (DSG) of crystal 0 front temperatures (front sensor 1), which matches the plot shown by Mark Jones



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Plot of calibrated (red) and uncalibrated (black) crystal 0 front temperatures (front sensor 1)

- Debugging version 2 of the control and monitoring LabVIEW program
  - ★ Made the same changes to version 2.4 as were made in 2.1; now both versions run for about 8 minutes before crashing
  - ★ Researching what can cause a LabVIEW program to lose connection to a real-time target
- Working on version 3 of control and monitoring program LabVIEW program
  - ★ Completed subVI to read configuration file; included subVI in a larger subVI of configuration file code
  - ★ Began chiller subVI and main VI

## **Hall D – FCAL2**

*George Jacobs and Mindy Leffel*

- Stripped 120 wires
- Tested 103 PMT bases; 542 good bases tested
  - ★ Five had shorted low voltage caps (output amplitude lower than expected), two had no signal, four had missing wires (visual inspection)

## **EIC – DIRC**

*Tyler Lemon*

- Started developing accelerometer system for shipping crates that logs data over entire trip from JLab to SLAC
  - ★ Previously used accelerometers with only a 4-hour battery life
  - ★ New system includes ten accelerometers read by an Arduino Uno R3 using a multiplexer that logs data to an SD card and is powered by a bank of 12 AA batteries; battery bank should last about five days
  - ★ Wrote code that initializes all system components, reads accelerometer data, and formats the data to a string for writing to the SD card

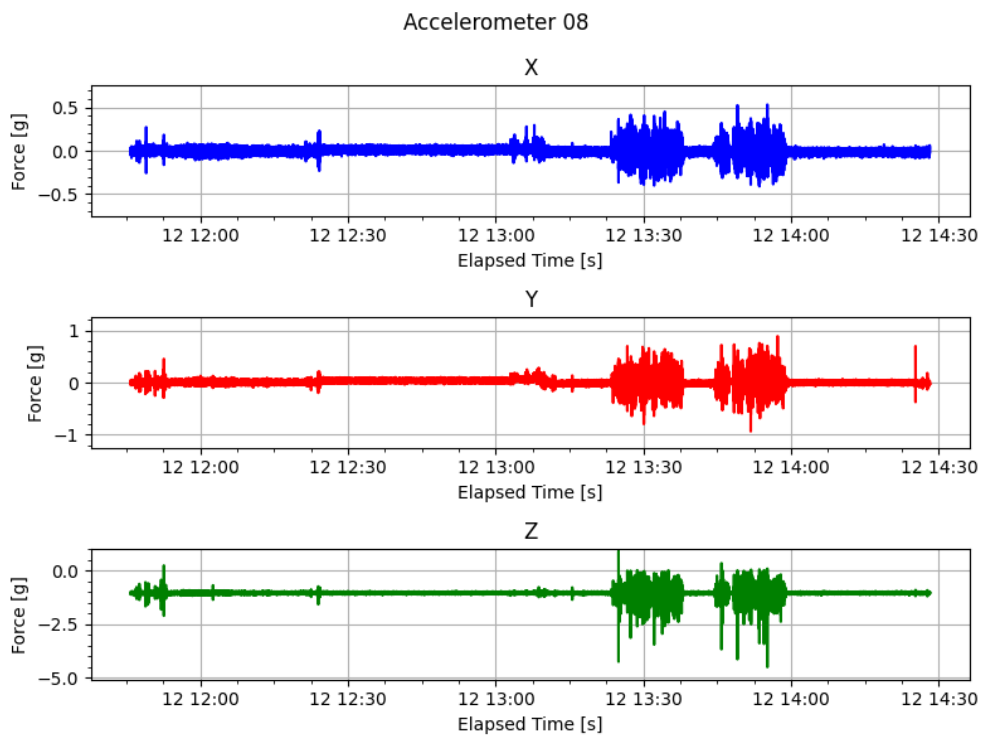


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- In NX, designed two boxes for accelerometer system that will be 3D printed
  - ★ The sensor box covers the accelerometers and has mounting holes for securing to crates
  - ★ The controller box holds the Arduino, multiplexer, power distribution, and RJ11 ports for connections to accelerometers
- Reviewed data from March 12 shipping crate suspension test
  - ★ Developed program to stitch USB accelerometer data files together and to timestamp data based on accelerometer's real-time clock
  - ★ Sensors on interior basket of crate showed higher forces than those on barbox mock-up when putting on the interior basket lid and crate exterior lid
  - ★ After crate lids were secured, truck vibrations caused the most forces



Plot of accelerometer data during shipping crate suspension test

## **DSG – R&D**

*Peter Bonneau*

- Developing self-test program for the Phoebus alarm system software packages
  - ★ Program will aid in the independent setup and debugging of the Kafka message streams and the Phoebus alarm server

## **DSG – Website**

*Mary Ann Antonioli*

- Completed updating website code so that talks include dates