

Detector Support Group

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

Weekly Report, 2023-10-04

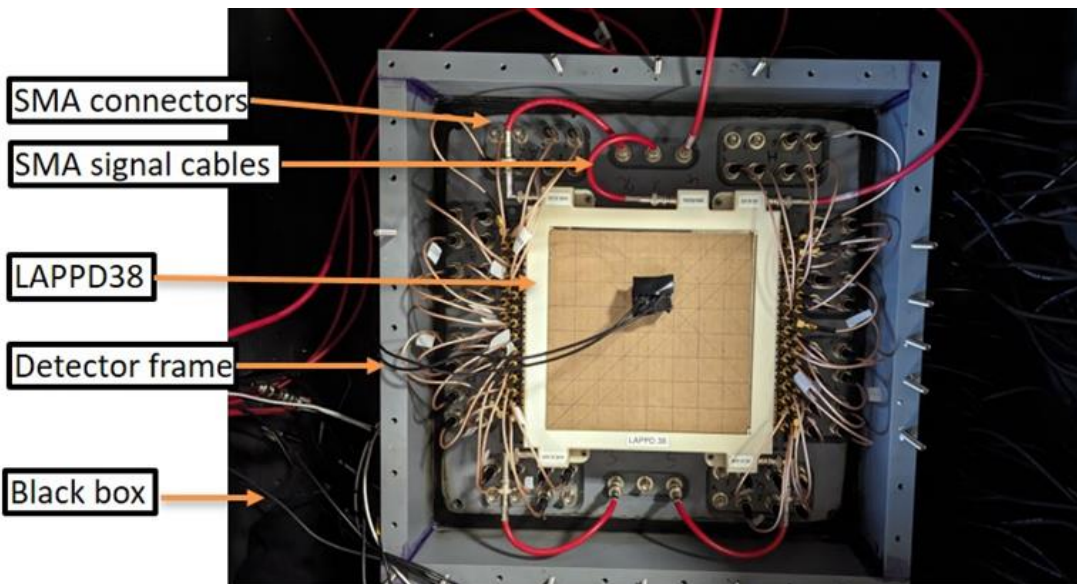
Hall A – ECAL

Brian Eng and Marc McMullen

- Completed installation and testing of 16-channel thermocouple module; will be used to monitor the surfaces of the six-supermodule test stand crystals
- Completed installation and testing of watchdog relay
 - ★ Monitors heartbeat signal
 - ★ Opens relay box heater power contacts if heartbeat is lost for >30 seconds; closes contacts if heartbeat returns
- Fabricated one high voltage cable with two Fischer connectors; 22/24 completed

Hall A - SoLID LAPPD (Large Area Picosecond Photodetector)

- Need to build an LED positioning system for LAPPD38



Hall B - Magnets

- Completed pre-power-up instrumentation and interlock checkouts for both magnets
 - ★ [P003 - Solenoid Pre-Power-Up Instrument Checkout](#)
 - ★ [P025 - Torus Pre-Power-Up Instrument Checkout](#)
 - ★ [P027 Torus Pre-Power-Up Interlock Checkouts](#)
 - ★ [P005 Solenoid Pre-Power-Up Interlock Checkouts](#)
- Debugged issues with voltage tap readback
 - ★ <https://logbooks.jlab.org/entry/4189846>



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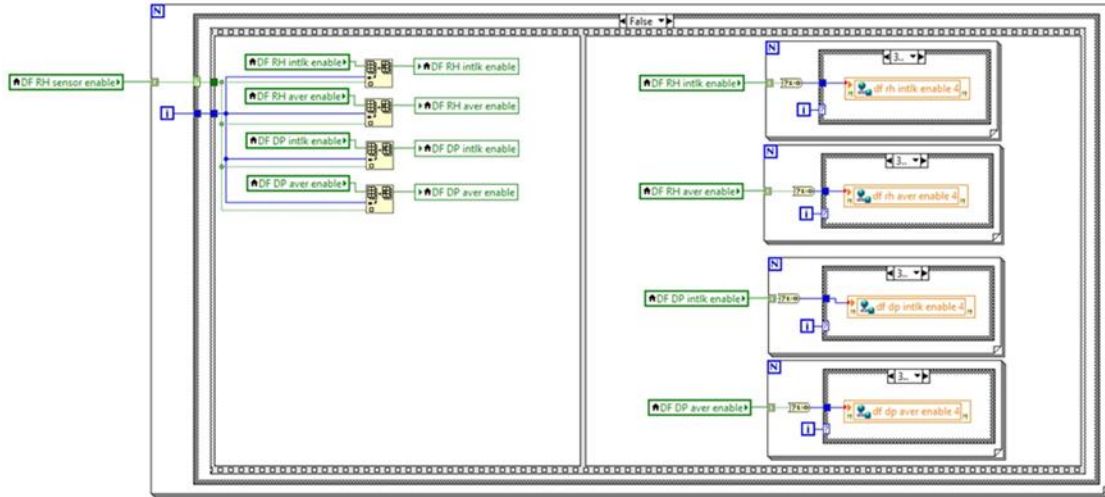
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Hall C – NPS

Mary Ann Antonioli, Peter Bonneau, Aaron Brown, Pablo Campero, Brian Eng, Mindy Leffel, and Marc McMullen

- Working on code to automatically disable interlock and averaging if a sensor is disabled



- ★ Adding code to send new values for interlock and averaging enables to EPICS shared variables
- Continued revision of control and monitoring software
 - ★ Continued changing local variables to shared variables and created new shared variables
 - ★ Created subVI that compares average to limits; replaced code with subVI for each detector area monitored
- Recovered NPS high voltage channels after interlock triggered by external chiller flow meters: <https://logbooks.jlab.org/entry/4191214>
 - ★ Investigating cause of erroneous flow meter temperature, pressure, and flow readings, shown below in red boxes

CS-Studio@cdaq12.jlab.org

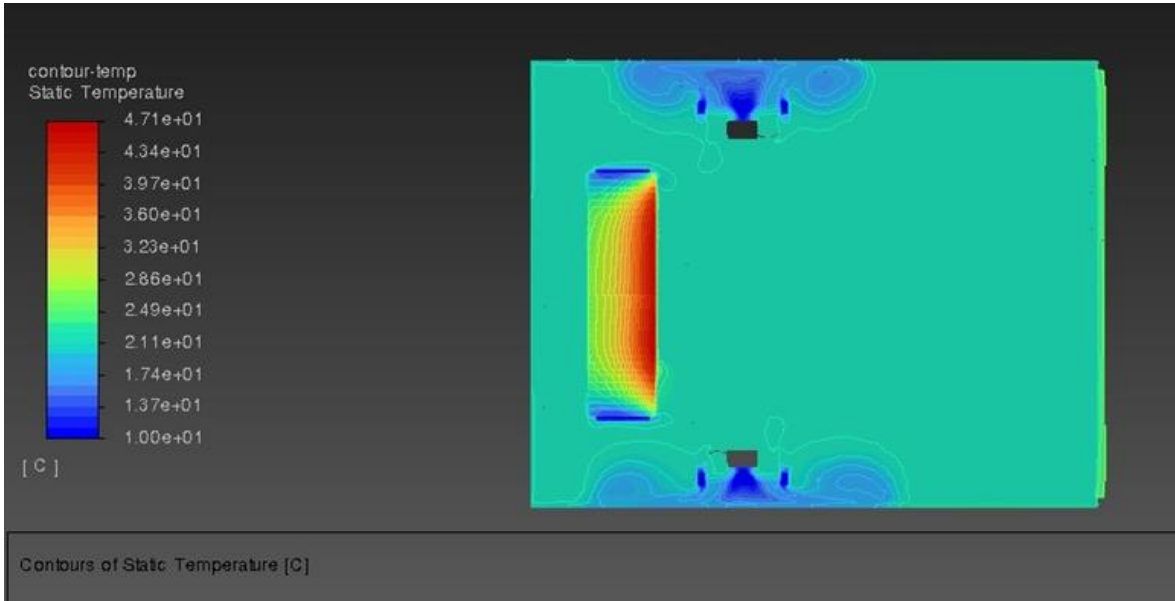
chiller coolant x

2023-10-02 19:45: Chiller Coolant

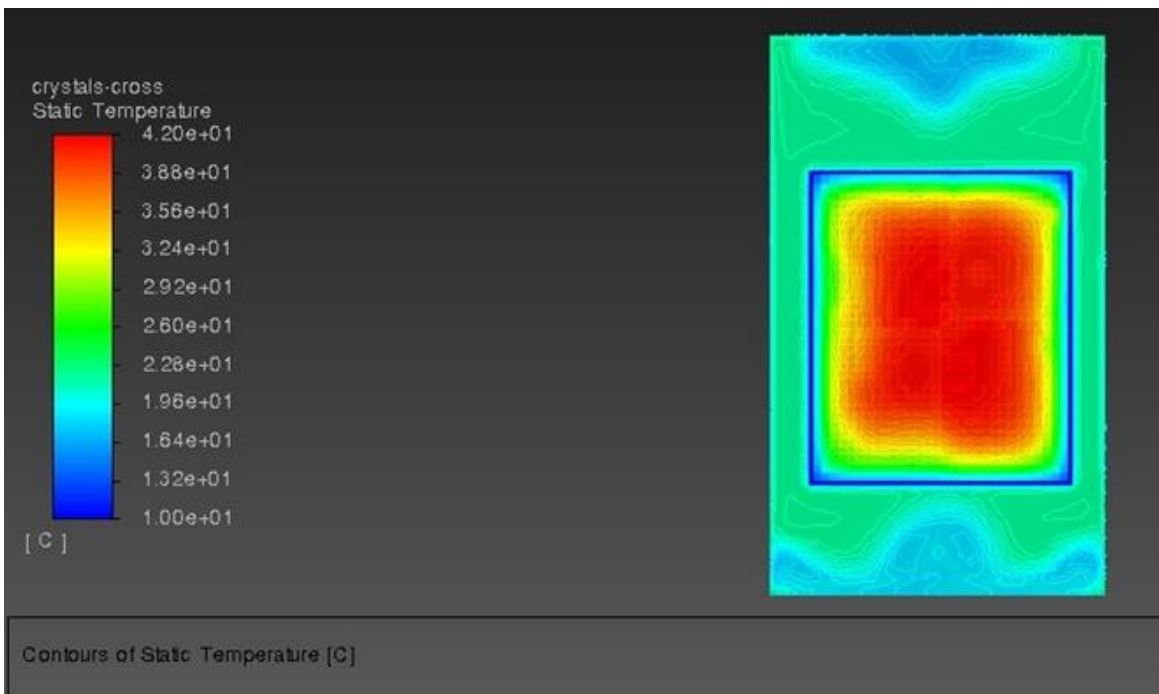
| Crystal Zone | | | | | | | Electronics Zone | | | | | | |
|-------------------------|---------|---------|----------|--------------|--------------|---------|------------------|----------|--------------|--------------|--|--|--|
| Monitoring | | | | | | | | | | | | | |
| Sensor | Avg | | σ | Intlk status | Latch status | Avg | | σ | Intlk status | Latch status | | | |
| supply temperature [°C] | 295.04 | -68004. | 10214. | On | On | -11668 | -92373. | 47882. | On | On | | | |
| supply pressure [psi] | -15554 | -12313 | 63835. | On | On | -15554 | -10693 | 72857. | On | On | | | |
| supply flow [l/min] | -24886. | -19701. | 11826. | On | On | -24886. | -17108. | 11657. | On | On | | | |

| Control | | | | | | | | | | | | | | |
|-------------------------|------------------|---------------|------------|------------------|--------------|-------------------|---------------------|------------------|---------------|------------|------------------|--------------|-------------------|---------------------|
| Sensor | Alarm limit [°C] | Sensor enable | Avg enable | # of pts. to avg | Intlk enable | Trip delay enable | Trip delay time [s] | Alarm limit [°C] | Sensor enable | Avg enable | # of pts. to avg | Intlk enable | Trip delay enable | Trip delay time [s] |
| | low high | | | | | | | low high | | | | | | |
| supply temperature [°C] | -1 30 | Off | Enabled | 300 | Off | Enabled | 30 | -1 30 | Off | Enabled | 300 | Off | Enabled | 30 |
| supply pressure [psi] | -1 70 | Off | Enabled | 300 | Off | Enabled | 30 | -1 70 | Off | Enabled | 300 | Off | Enabled | 30 |
| supply flow [l/min] | -1 30 | Off | Enabled | 300 | Off | Enabled | 30 | -1 30 | Off | Enabled | 300 | Off | Enabled | 30 |

- Ansys Fluent thermal analysis
 - ★ Resolved high spot temperature issue; temperatures are within expected range

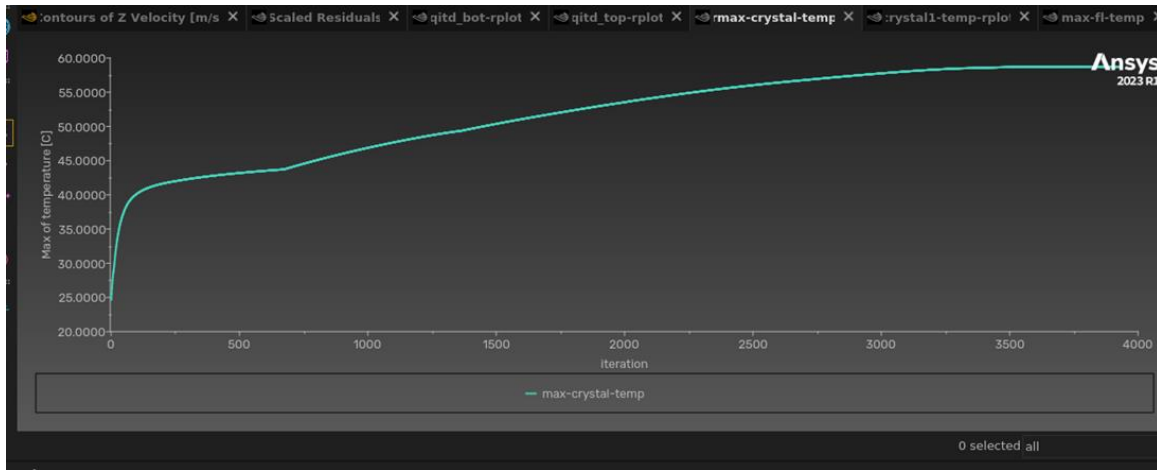


Temperature contour plot for YZ plane cross-section, right view, of detector. High temperature at the crystals rear face is $>47^{\circ}\text{C}$.



Temperature contour plot for XY plane cross-section, front view, of the detector.

- Needed 4000 iterations for the crystal temperature to reach steady state



Hall D – FCAL2

Mindy Leffel

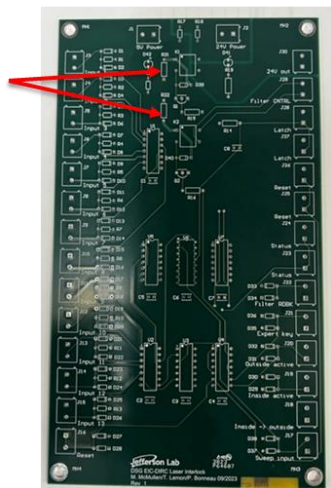
- Populated 10 PMT bases; 620/1750 completed

EIC - DIRC

Peter Bonneau, Mindy Leffel, George Jacobs, Tyler Lemon, and Marc McMullen

- Installed optical table side wall position monitors
- Performed study of light from exit sign in laser area to determine whether light is steady (DC-powered) or varies over time (AC-powered)
 - ★ Results show that light is steady and can be treated as background noise
- Braces are missing from six of eight quartz bar shipping crates; made NX12 model of wooden brace design that can be used for a formed aluminum panel version
 - ★ Requested quotes for formed aluminum panels for fabrication by online machine shop and for identical wooden braces from external shop
- Received DIRC Laser interlock PCB rev1; tested new connections and checked for plane shorts

New 330-Ω resistors will limit the current to the relays from 50 mA to 30 mA





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- Continued Phoebus alarm test software for interlock
 - ★ Developing Phoebus alarm system server interface

DSG

Peter Bonneau and Aaron Brown

- Website
 - ★ Moved Monthly Memos from HTML webpages to Drupal webpages
 - ★ Revised DSG Spotlight photo software
 - ★ Converted DSG weekly summary section of website to Drupal
 - ★ Updated main index page, staff phone list, and additional webpages