



Detector Support Group

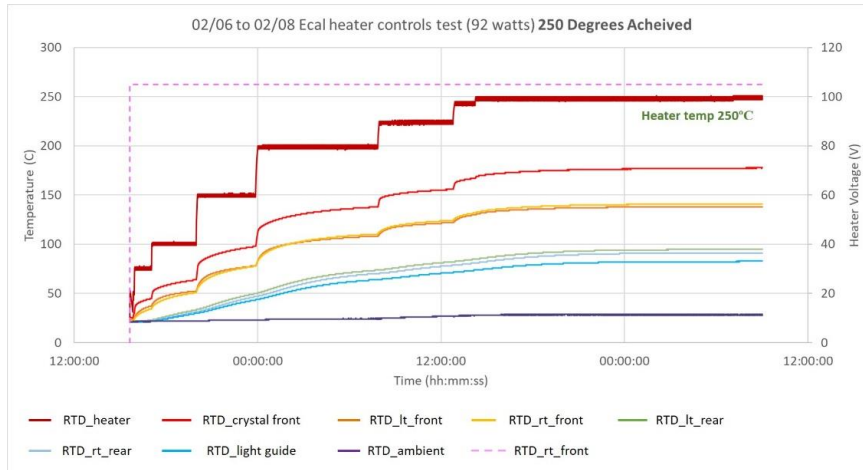
We choose to do these things "not because they are easy, but because they are hard".

Weekly Report, 2023-02-15

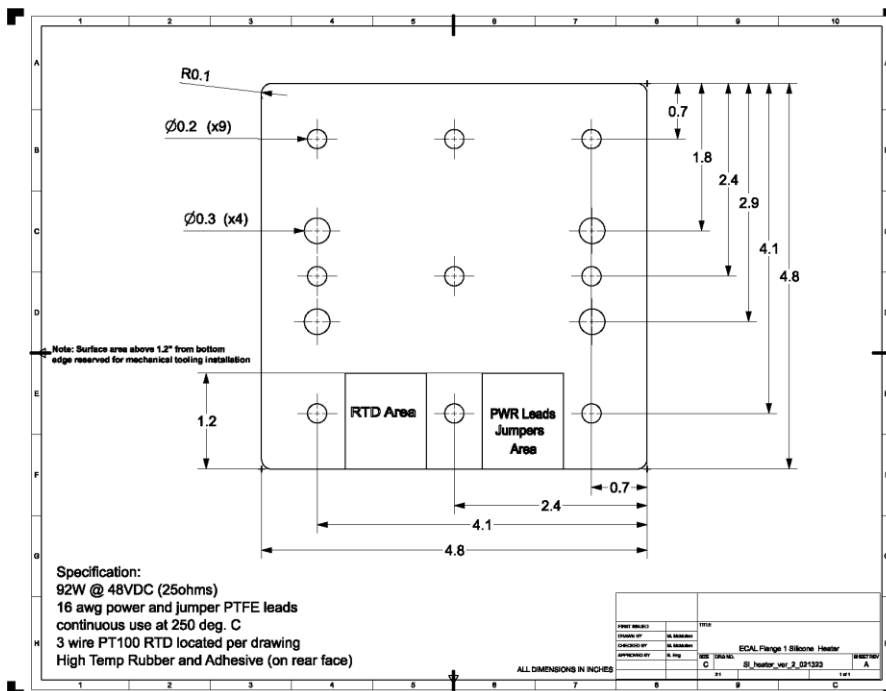
Hall A – ECAL

Marc McMullen

- Completed test of ECAL heater inside an insulated enclosure (mineral wool and Teflon) at 92 W
 - ★ The heater temperature was controlled to 250 °C, $\leq 0.5\%$



- Completed version 2 drawing of the heater





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Hall A – Møller

Mary Ann Antonioli and Brian Eng

- Reviewed RTD drawings with Kaiyi and Probir
 - ★ Switched to regular multi-conductor cable from the previously chosen twisted pair
- Discussed possible isolation amplifiers with vendors, via emails and meetings
 - ★ Prefer to have single unit of at least 250 V, preferably 300 V, that can handle all voltage taps, since 224 V needed for entire torus magnet 4, coils A – G
- Began Phoebus screen for magnet 2 temperatures

Hall A – SoLID

Mary Ann Antonioli and Pablo Campero

- Made Visio flowchart of alarm and email notification system
- Modified *Solenoid CCR Expert* HMI screen

Hall B – Magnets

Brian Eng

- Fast dump of both magnets: <https://logbooks.jlab.org/entry/4127751>
- Appears to be issue with Torus PLC
 - ★ Generated support ticket with Rockwell Automation: 4010006007
 - ★ Needed to provide much information to get support—models and firmware for all modules, software versions, current project file, etc.

Hall B – SVT

Brian Eng

- Troubleshooting lost communication from interlock cRIO
 - ★ <https://logbooks.jlab.org/entry/4130269>
 - ★ Swapped out the cRIO controller/supply: <https://logbooks.jlab.org/entry/4130487>
 - ★ Generated support request with National Instruments: 02052980 (RMA may be generated for bad hardware)

Hall C – NPS

Mary Ann Antonioli, Peter Bonneau, Aaron Brown, Pablo Campero, Brian Eng,

Mindy Leffel, and Marc McMullen

- Adding relay module to cRIO to control remote power controllers for chillers
 - ★ Relay module not accessible from project despite being visible in NI-Max and from computers with higher versions of LabVIEW (development computer uses LabVIEW 2020)
 - ★ Downloading LabVIEW 2022 to development computer for possible resolution
- Debugging Python script for high voltage settings
 - ★ Some channels return a warning of write request failure and some channels will not accept a new set value
 - ★ Implemented a wait time of 0.25 s after each set command, but still unresolved
 - ★ Checking Pyepics (Python package for EPICS) documentation for a method of accessing PVs that may be more reliable



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- Attempted to correct problem of overlapping components in Ansys crystal array model by using Ansys SpaceClaim interference tool
 - ★ Corrected overlapping components and generated mesh, but was unable to import corrected model to Fluent
 - ★ Debugging in progress
- Connected AC relay switch to the cRIO power distribution and tested circuit
- Terminated two 50-conductor, D-sub cables; nine of 12 completed
- Tested all Phoebus V4.6.10 applications after system rebuild

Hall D – JEF

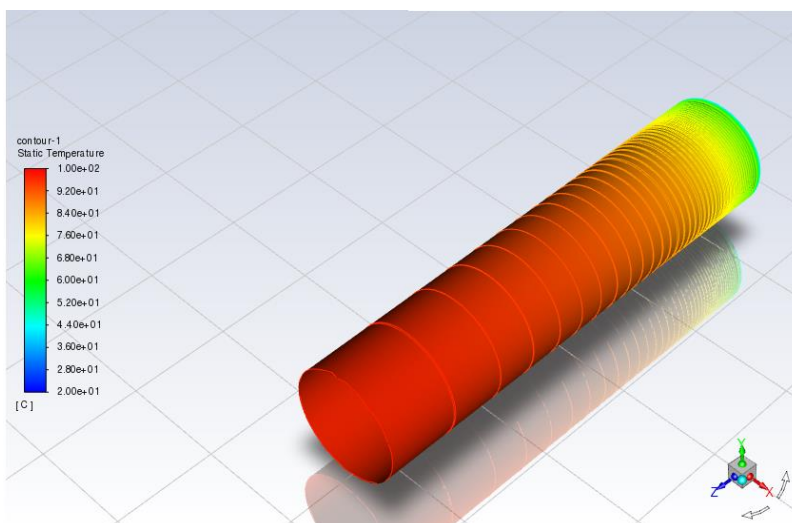
George Jacobs and Mindy Leffel

- Disassembled, cleaned, and inspected three crystals (42 total)
- Wrapped 18 crystals with foil only (no Tedlar)

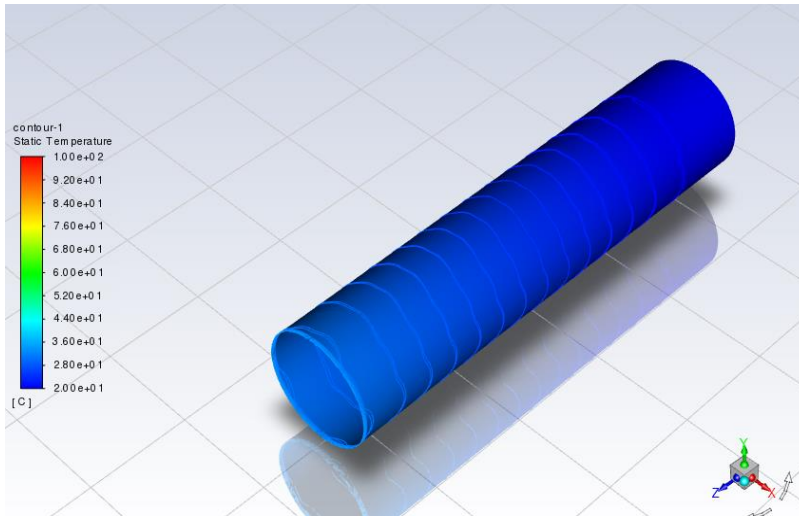
EIC

Brian Eng and Pablo Campero

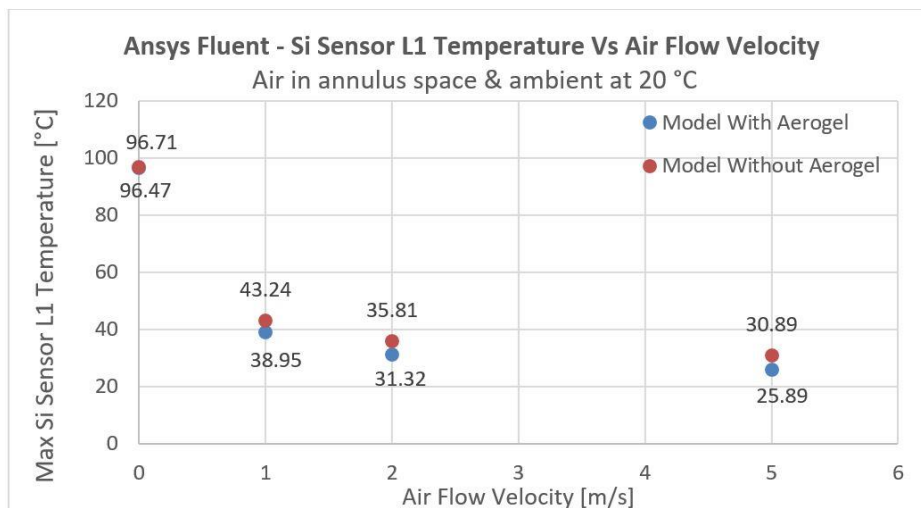
- Met with LBL Mechanical Designers about possibility of contributing to silicon design
- Modified beampipe 3D model, imported model to *Ansys Fluent*, and configured for thermal analysis
- Ran simulations with different aerogel properties to see effect on silicon sensor layer 1 temperature
 - ★ Changed density from 50 to 250 Kg/m³
 - ★ Used two values for thermal conductivity (cp = 0.0156 and 0.0140)
 - ★ Only change in thermal conductivity affects silicon sensor layer 1, by 1°C
- Ran five simulations to check maximum temperature of silicon layer 1, varying air flow velocity in the annulus space and enclosure from 0 to 5 m/s and temperature constant at 20°C



Model with aerogel and 5 mm separation between the beryllium pipe and silicon sensor layer 1; air flow velocity of 0.001 m/s



Model with aerogel and 5 mm separation between the beryllium pipe and silicon sensor layer 1; air flow velocity of 2 m/s



Temperature vs velocity for 5 mm separation model, with and without aerogel

EIC-DIRC

Tyler Lemon

- Investigating side walls for optical table in laser lab
 - ★ Pre-made vs. custom panels
 - ★ How to lock walls into vertical position
- Tested Altium's simulation capabilities with laser interlock circuit; best for non-interactive simulations of circuits with generic components used at the beginning of design process
 - ★ Replaced schematic components with generic simulation models
 - ★ Performed DC operating point simulation; runs system at 5 VDC and probes monitor output