Detector Support Group

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

Weekly Report, 2023-10-18

Hall A – ECAL

Brian Eng, Mindy Leffel, and Marc McMullen

- Troubleshooting heater controls cRIO issues
  - ✶ Unable to connect via MAX; able to connect to debug session in RealTime app; rebooting cRIO via LabVIEW project fails; trying to connect via SSH works, but immediately closes connection
  - ✶ Running commands via SSH seem to indicate hard drive failure
- Completed control GUI which can be used from any LabVIEW PC on the Hall A subnet to control and monitor the ECAL heater controls
- Fabricated one HV cable with two Fischer connectors – 24 of 24 completed

Hall A - SoLID LAPPD (Large Area Picosecond Photodetector)

Pablo Campero

- Installed software (Kinesis) to control and monitor linear translation stage system from Thorlabs
- Installed Kinesis simulator software to simulate the incremental movement of the stage system to a desired location within the allowed distance of travel
  - ✶ Simulates the incremental movement of the stage system to a desired location within the allowed distance of travel
  - ✶ Outputs the coordinate position for Kinesis software

Hall B – Magnets

Pablo Campero and Brian Eng

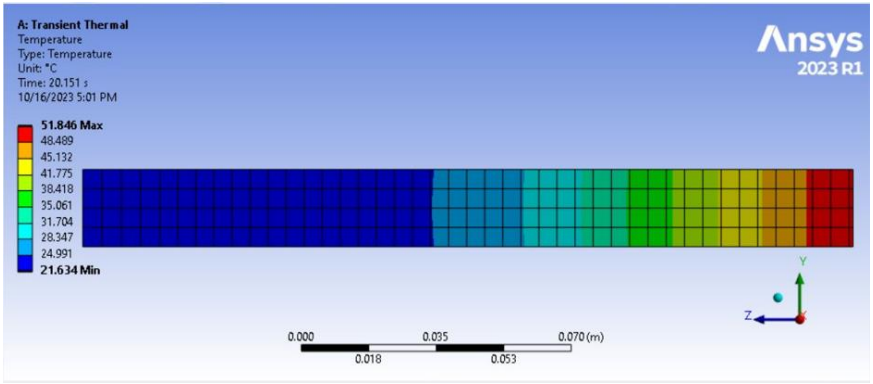
- Investigating 10-10-23 fast dump
  - ✶ Received fast DAQ data from tape and submitted pull request on Github to update analyzer program to have hardware comparators as plot choices
  - ✶ Working on extracting data just around the time of the dump rather than full 20 minutes to analyze using Excel or Python

Hall C – NPS

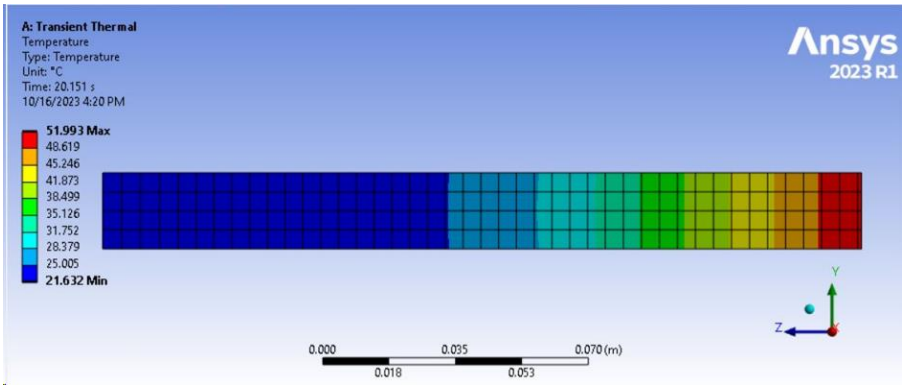
Mary Ann Antonioli, Peter Bonneau, Aaron Brown, Pablo Campero, Brian Eng, Mindy Leffel, and Marc McMullen

- Debugging and revising thermal readback LabVIEW program
  - ✶ Completed code to automatically disable corresponding averaging if the interlock has been disabled
  - ✶ Changed code to have the interlocks triggered using the temperature and flow directly from the chillers
    - ▪ The chiller has built-in alarms for low flow as well as for under and over temperature; these alarms will now be used to trigger interlocks for both chillers
- Creating named selections for each crystal of the 1080 crystals using Ansys SpaceClaim
  - ✶ The named selections are the portion of the crystals between the carbon fiber and mu metal dividers (along the length of the crystal) that are exposed to air
  - ✶ Convection will be applied to these named selections and the simulation will be rerun

- Modified single crystal model
  - ✶ Divided crystal into five regions: front, back, air, mu-metal, and carbon fiber regions – regions allow setting convection only on air region
  - ✶ Kept thin slice volume attached to the rear face of the crystal to enable the setup of internal heat generation
- Ran simulation with different thermal conditions
  - ✶ Set up model with internal heat generation of 7.5×10^5 W/m^3 and then with heat flow of 0.3 W
  - ✶ For both cases, applied convection on six faces: front, back, and air region (four faces)
  - ✶ Noted a maximum temperature of ~52°C for both cases



Right side view; temperature contour plot of crystal with internal heat generation of 7.5×10^5 W/m^3 and convection on six faces. Max. temp. was 51.8°C



Right side view, temperature contour plot of crystal with heat flow of 0.3 W and convection on six faces. Max. temp. was 51.9°C

Hall D – FCAL2

Mindy Leffel

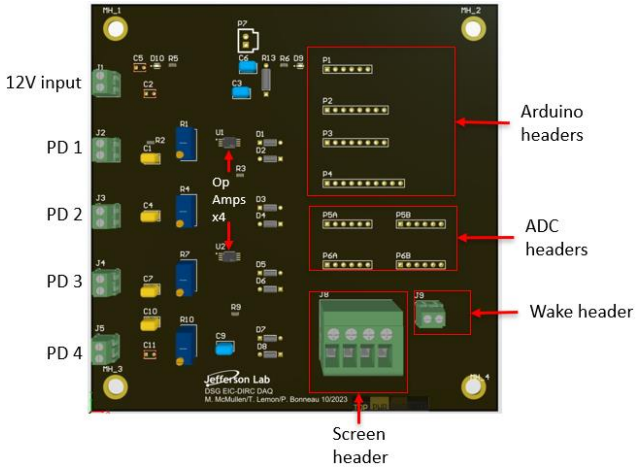
- Populated 20 PMT bases – 665 of 1750 completed

EIC - DIRC

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

- Verified the fit of the large wood bracket in new crate

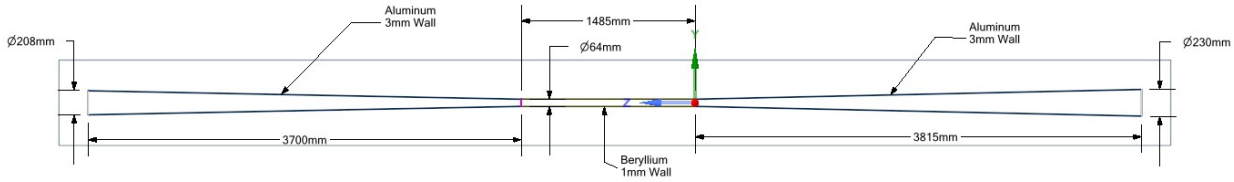
- Continued component placement for the data acquisition PCB with photodiodes (PD 1-4), wake header (used to activate the screen), and an Arduino microcontroller used to read the photodiodes from the ADC



EIC - Thermal Test Stand

Pablo Campero, Brian Eng, George Jacobs, and Marc McMullen

- Created simplified model with the Aluminum and Beryllium sections of the beampipe – dimensions are based on the EIC design drawings and CAD model



Beampipe simplified model with Beryllium and Aluminum sections

EIC – Tracking

Brian Eng

- Presented talk on day 2 of CD-3A director's review

DSG R&D – Phoebus

Peter Bonneau

- Phoebus alarm test for EIC-DIRC interlock
  - ✶ Developed and implemented an EPICS softIOC laser interlock signal simulator to test the code written for the EIC-DIRC test
  - ✶ Developed a user interface for the EIC-DIRC alarm system and softIOC simulator

DSG

Peter Bonneau

- Developed and implemented a navigation bar for all DSG web pages