Detector Support Group

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

Weekly Report, 2021-06-09

Summary

Hall A – SoLID

Mary Ann Antonioli, Pablo Campero, Mindy Leffel, Marc McMullen

- Developing PLC Control manual
  - ✶ Generated flowcharts for *v3_set LN2 Bottom Fill Valve* and *LN2_Shield_Cooldown* PLC subroutines
  - ✶ Generated a true/false table to show cryogenic conditions required to open and close *JTV3 LN2 Bottom Fill* and *JTV5 LN2 Top Fill* valves

Hall B – Magnets

Aaron Brown, Tyler Lemon

- Completed the Torus and Solenoid pre-power-up and instrumentation checks
- Developed, using Python, automated program for Torus pre-power-up instrumentation checks
  - ✶ Program compares sensor reading to expected value and automatically posts check results to appropriate logbook

Hall B – RICH-II

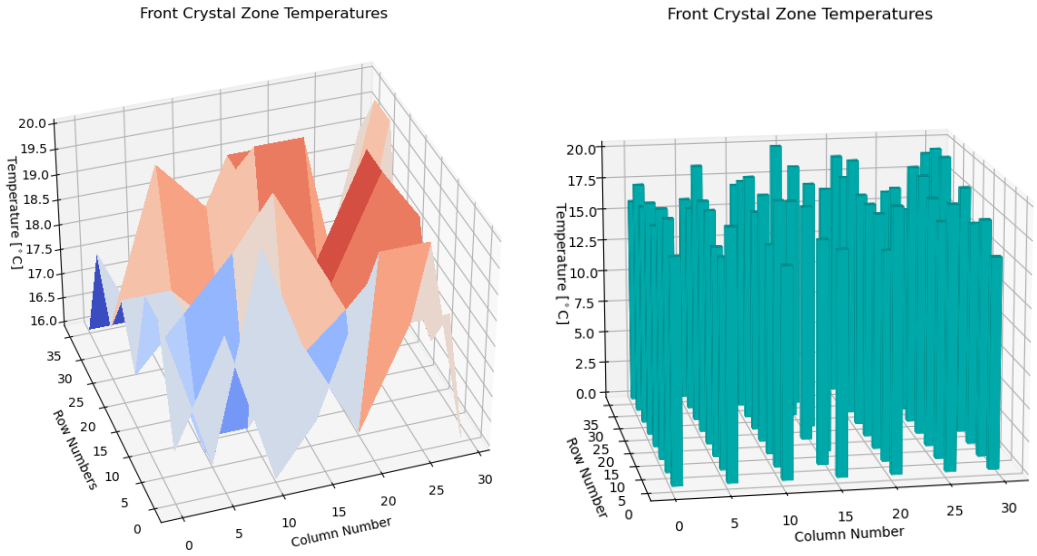
Mary Ann Antonioli, Peter Bonneau, Pablo Campero, Tyler Lemon

- Tested Conec feedthrough for passing hardware interlock cables into N_2 Volume
  - ✶ Feedthrough has two parts: bulkhead feedthrough and backshell
  - ✶ Assembly leaks around RJ45 connector, through cable jacket; looking into whether connector can be sealed with RTV or silicon sealant
- Investigated alternative gas-tight cable feedthroughs; compiling options into a talk
- Developing LabVIEW front panel for hardware interlock system
- Developing, using ANSYS, thermal simulation for electronic panel
  - ✶ Analyzing points for heat loads
  - ✶ Researching FPGA specifications for the heat load generated during operation
- Developing RMC PCB
  - ✶ Completed routing traces for the RMC connector to the backplane board connector area

Hall C – NPS

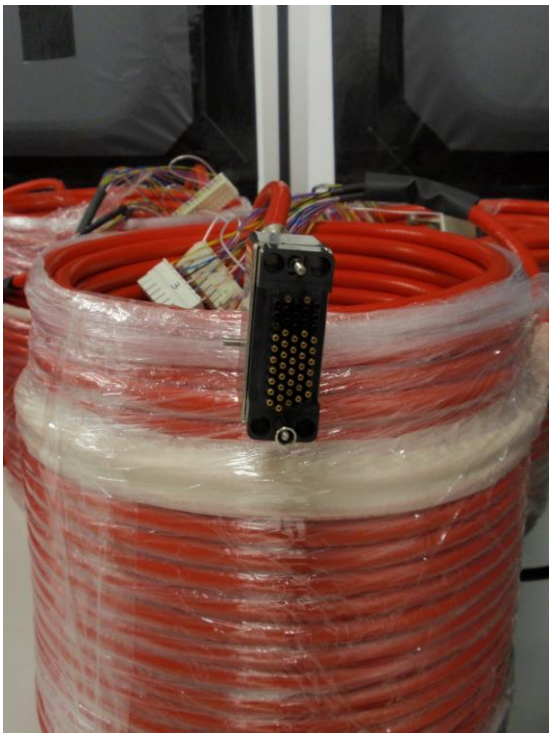
Mary Ann Antonioli, Peter Bonneau, Aaron Brown, Pablo Campero, Brian Eng, George Jacobs, Mindy Leffel, Tyler Lemon, Marc McMullen

- Generated, using Python, surface and bar plots of front crystal zone temperatures
  - ✶ Plots were created using randomly generated numbers for the 56 temperature sensors in the front crystal zone



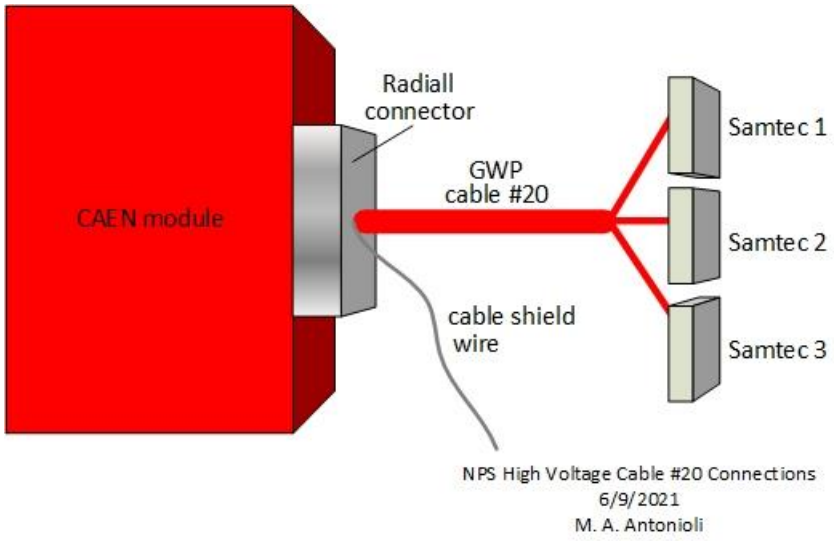
Surface plot (left) and bar plot (right) of randomly generated front crystal zone temperatures

- Developing LabVIEW Keysight scanning program
  - ✶ Populated four arrays with temperature values corresponding to front and back crystal zone temperatures (two arrays of 28 values each)
- Fabricated five HV supply cables: 39 of 40 complete
- Long-term load testing of HV supply cables: 17 of 40 complete



Radiall and SAMTEC connectors for one of the 140' HV supply cables

- Made Visio drawing of high voltage supply cable



Drawing showing connectors and cable shield wire of HV supply cable #20

DSG R&D - GEM

Brian Eng

- Setting up external ADC/DAC boards for Raspberry Pi that communicates over Serial Peripheral Interface to monitor Magnehelics
- Output and input are both ~0.5% off, so that when the DAC is supposed to output 20 mA, the ADC reads it as ~20.2 mA
    - ✶ Will need to test with a more accurate DMM and voltage calibrator