DSG NPS Collaborators' Meeting Update

Aaron Brown and the
Detector Support Group
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- High Voltage Supply Cable
  - Fabrication
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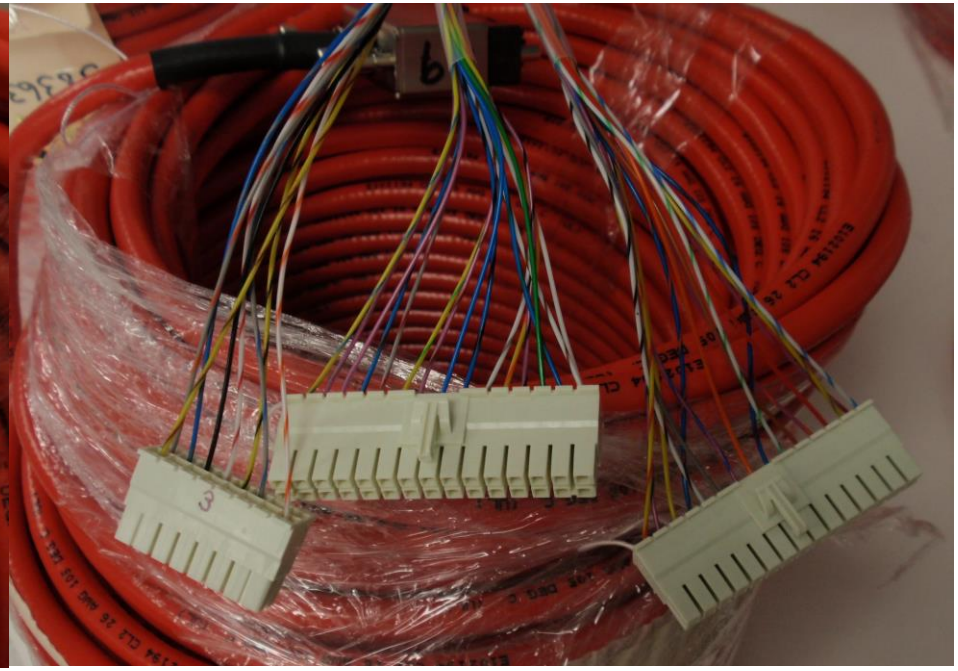
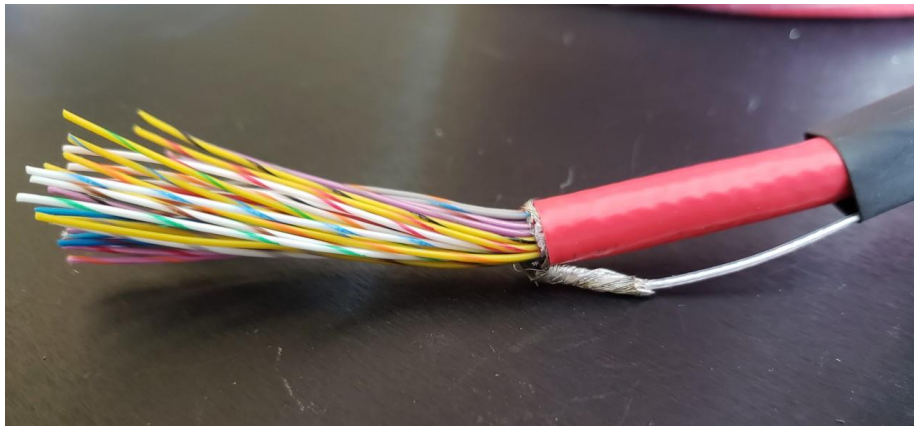
HV Supply Cable Fabrication

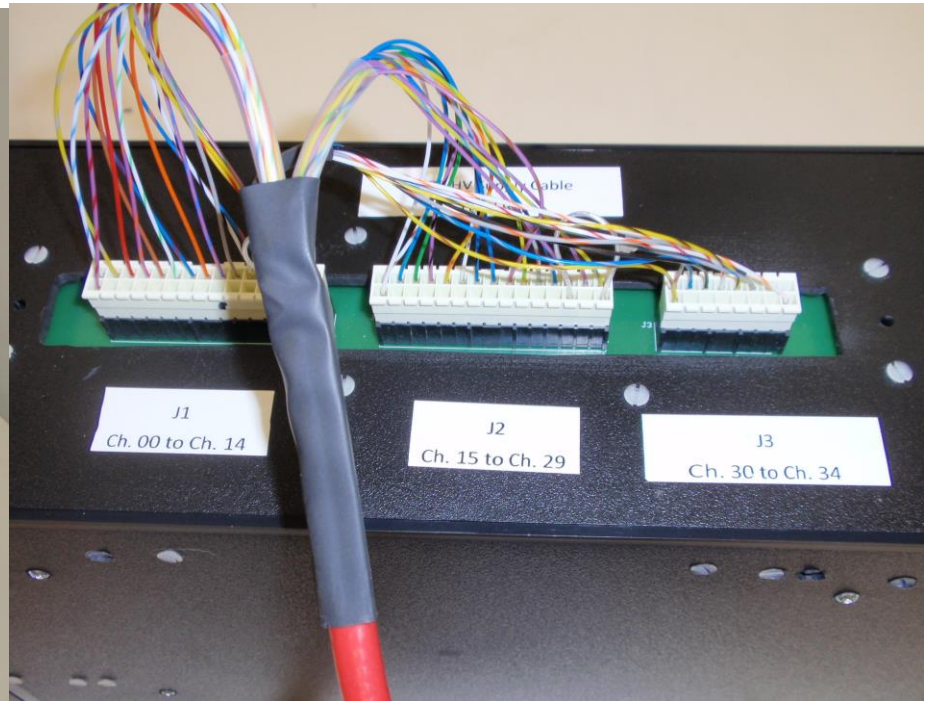


- Fabricated forty 145’ HV supply cables
- Terminated Radiall 52-pin connectors
- Terminated three SAMTEC connectors
- Close-up of attached cable shield wire for grounding



HV Supply Cable Testing

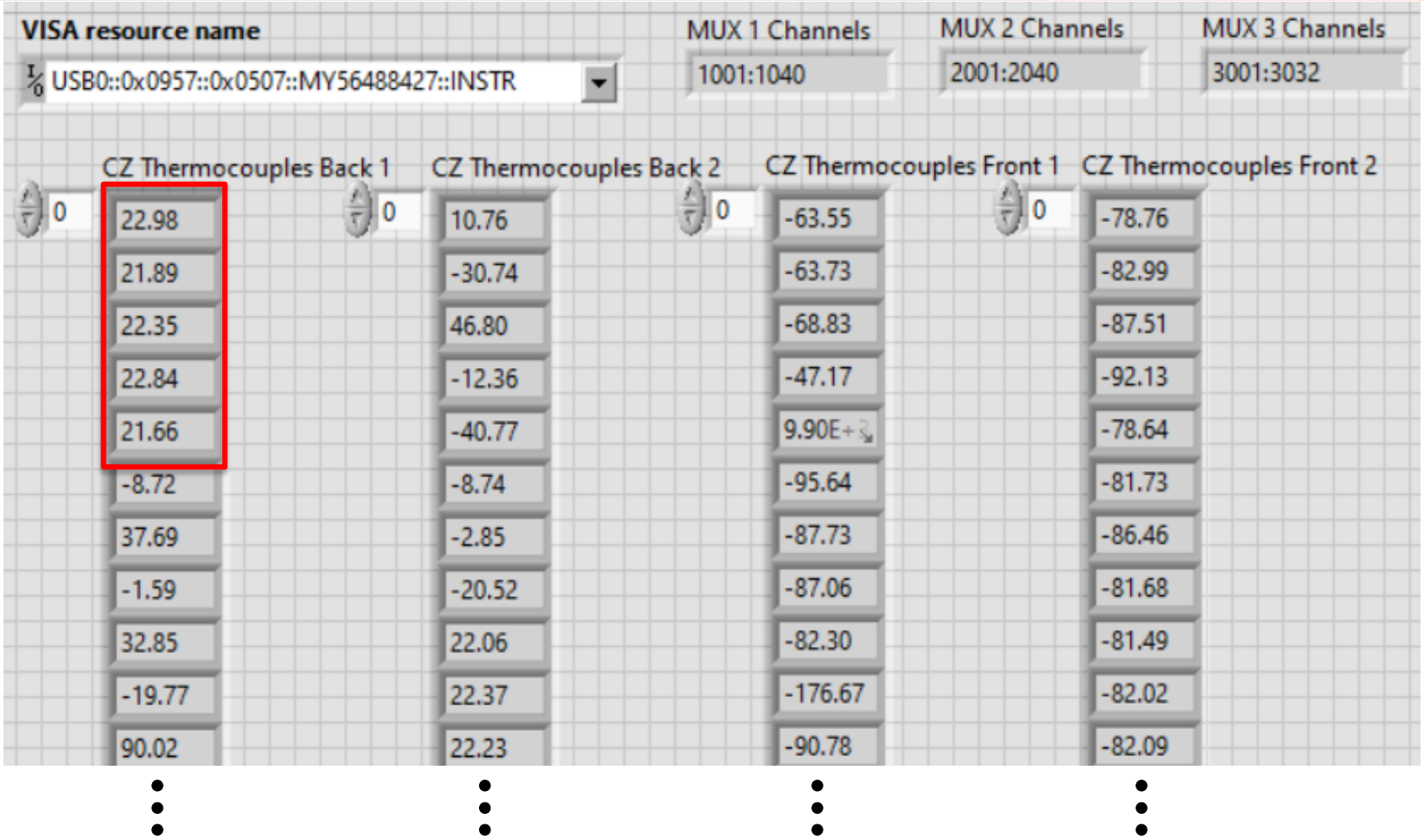
HV supply cable test station in DSG cleanroom



Close up:SAMTEC connectors plugged into DSG HV Cable Test Chassis

- Long-term testing: 21 of 40 complete
  - Plots uploaded to DSG NPS Technical Documentation webpage
- Switch testing will start after long-term testing is completed

LabVIEW Keysight Scanning Program



- Crystal zone sensors scanned and temperatures stored in four arrays
  - 28 elements/array
- Two arrays each for front and back thermocouples
- Formatting and conversions handled by Keysight mainframe (no raw values)

LabVIEW Hardware Interlock System Program

Crystal Main | Front Crystal Zone Temperatures | Back Crystal Zone Temperatures | Ambient Temperatures | Temperature Map | Plots | Expert Settings

STOP

Front Crystal Zone Temperatures [C°]

average, all front Crystal Zone temperatures: 17.9

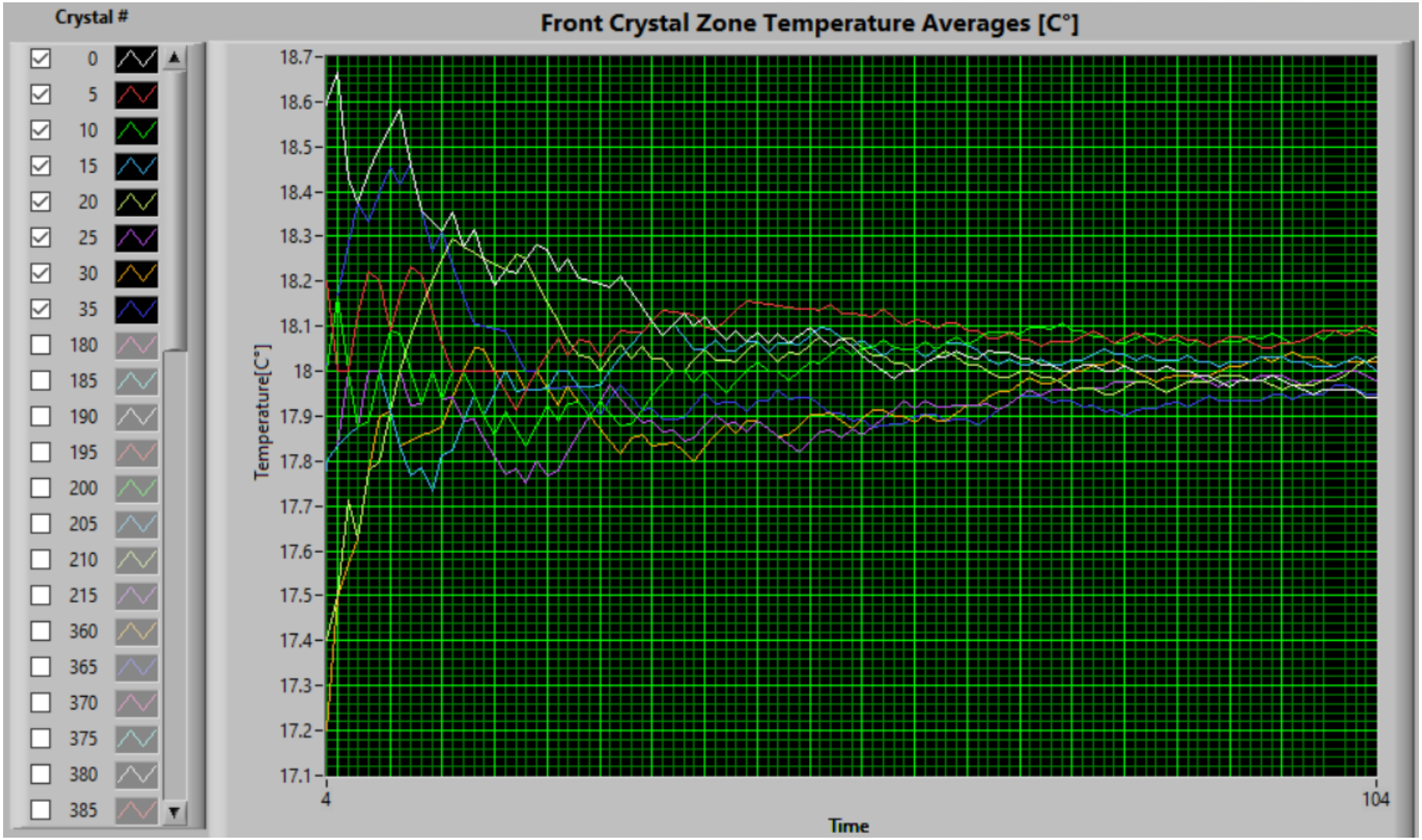
crystal	temps.	avg.	std. dev.	over limit	under limit
0	19.0	18.0	0.8		
5	18.0	18.1	0.8		
10	18.0	18.0	0.8		
15	17.0	17.9	0.8		
20	19.0	18.0	0.8		
25	19.0	18.0	0.8		
30	17.0	18.1	0.9		
35	19.0	18.0	0.8		
180	18.0	18.0	0.8		
185	18.0	18.0	0.8		
190	18.0	17.9	0.8		
195	17.0	18.0	0.8		
200	17.0	17.9	0.8		
205	19.0	18.1	0.8		
210	18.0	18.0	0.8		
215	17.0	18.1	0.8		
360	19.0	18.1	0.8		
365	19.0	18.0	0.8		
370	19.0	18.0	0.9		
375	19.0	18.0	0.8		
380	18.0	18.1	0.8		

crystal	temps.	avg.	std. dev.	over limit	under limit
540	18.0	18.1	0.7		
550	18.0	18	0.8		
560	17.0	18.2	0.8		
570	17.0	18.1	0.8		
684	17.0	18	0.8		
689	17.0	18	0.8		
694	19.0	18	0.9		
699	17.0	17.9	0.8		
704	17.0	18	0.8		
709	19.0	18	0.8		
714	18.0	18	0.8		
719	18.0	17.9	0.8		
864	17.0	18	0.8		
869	18.0	18.2	0.8		
874	19.0	18	0.8		
879	18.0	18	0.8		
884	19.0	18	0.8		
889	19.0	18.2	0.8		
894	18.0	17.9	0.8		
899	18.0	18	0.8		
1044	17.0	18	0.8		

LabVIEW Hardware Interlock System Program

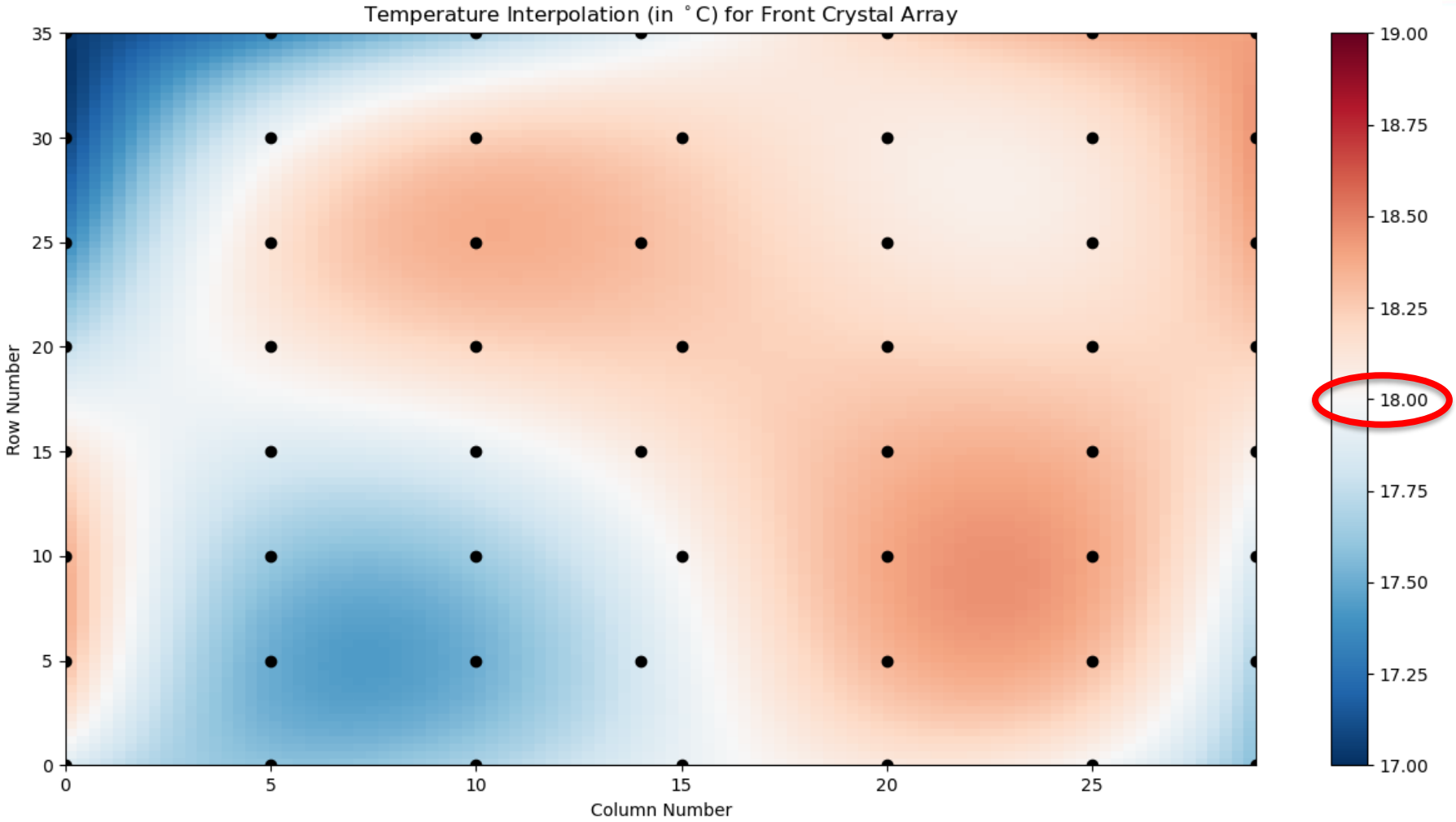
- Developed code for front and back crystal zone temperatures – tested averages, standard deviations, and over/under limits
- Added all-temperatures average to Crystal Main tab
- Completed plotting of averages for both crystal zones

LabVIEW Front Panel Development



- Live plot of crystal zone average temperatures (random numbers)

Crystal Zone Temperature Mapping



- Temperature map of front crystal array
  - Made using randomly generated temperature values 17°C ≤ T ≤ 19°C
  - Temperatures between sensor locations estimated using Python bivariate spline interpolation

Conclusion

- George Jacobs is currently testing the HV supply cables fabricated by Mindy Leffel using the load box designed by Marc McMullen
- Development of LabVIEW Keysight scanning program (Aaron, Peter, and Brian) and Hardware Interlock System (Mary Ann) in progress
- Thermal analysis (Aaron) of crystal zone underway
- Good progress!

Thank You!