

# Detector Support Group

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

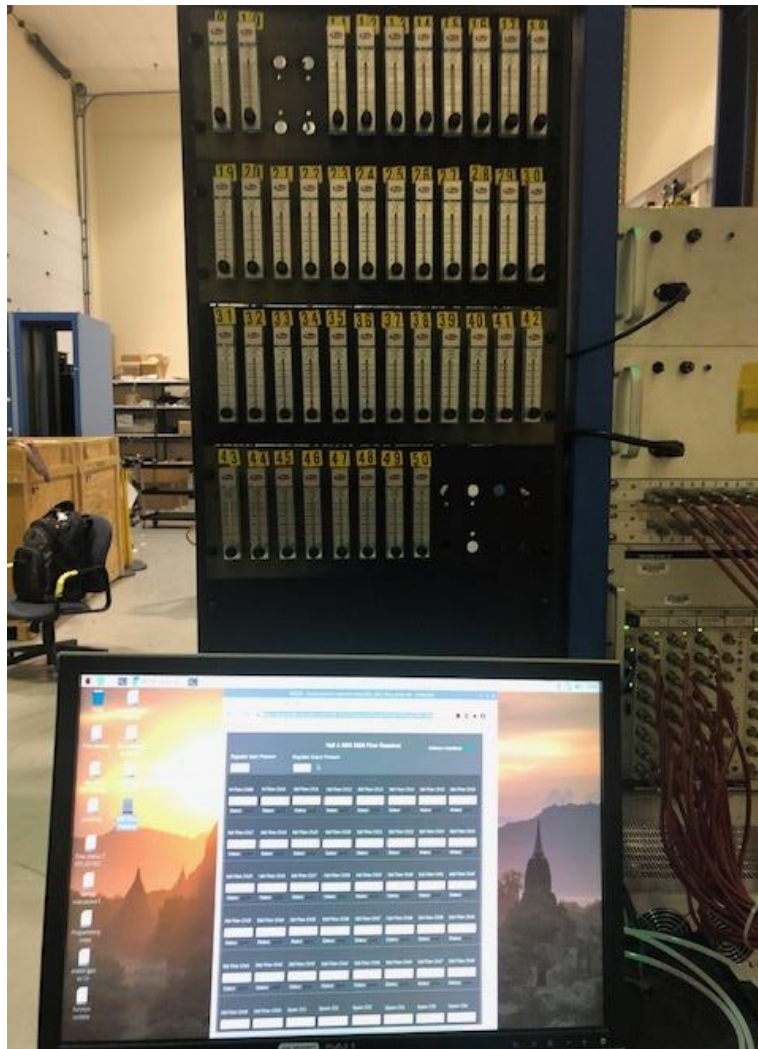
**Weekly Report, 2021-10-06**

## Summary

### Hall A – GEM

*Brian Eng, George Jacobs, Marc McMullen*

- Set up 48-channel gas flow readout monitoring system for SBS: 42 operational channels plus six spare channels
- Set up local gas flow monitoring station at the SBS test stand



DSG designed SBS gas flow distribution system with 48-channel gas flow monitoring screen

### Hall A – SoLID

*Mary Ann Antonioli, Pablo Campero, Brian Eng, Mindy Leffel, Marc McMullen*

- Wired PLC IO module's terminal to the instrumentation rack terminal blocks
- Developing electrical drawings A00000-16-03-0050 and A00000-16-03-0304



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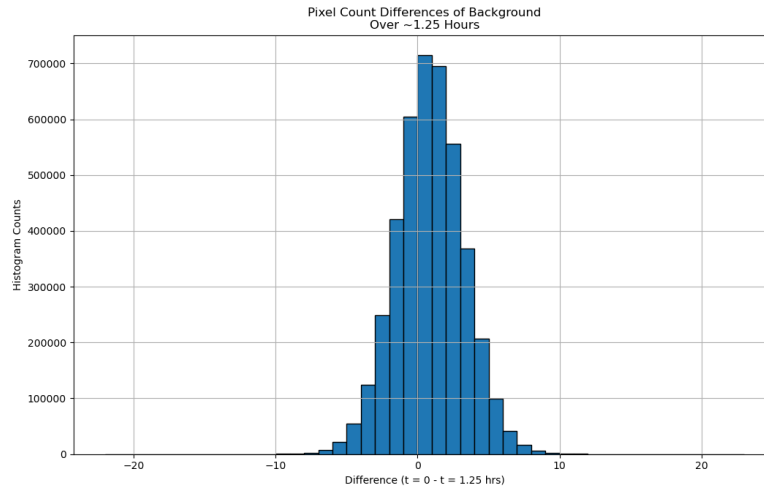
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## Hall B – RICH-II

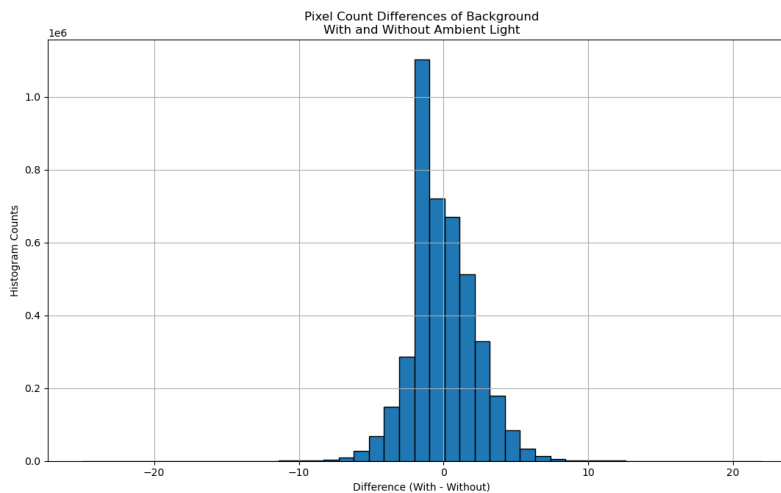
Mary Ann Antonioli, Peter Bonneau, Pablo Campero, Brian Eng, George Jacobs, Tyler Lemon, Marc McMullen

- Performed stability study with Ximea CCD for d0 test station – calculated average difference in background data for background images taken ~1.25 hours apart
  - ★ Average difference was  $0.36 \pm 2.38$  counts
  - ★ Background data will be taken before each d0 measurement



Histogram of difference between pixel counts at time T= 0 hours and T = ~1.25 hours

- Conducted study to determine whether eliminating ambient light sources in cleanroom affects background data – calculated average difference in background data for background with and without ambient light in cleanroom
  - ★ Average difference was  $0.13 \pm 2.39$  counts



Histogram of difference between pixel counts with and without ambient light eliminated from cleanroom

- Repeated d0 tests on spherical mirrors 5 and 5C in horizontal and vertical positions
  - ★ All measurements were taken with no ambient light sources in cleanroom



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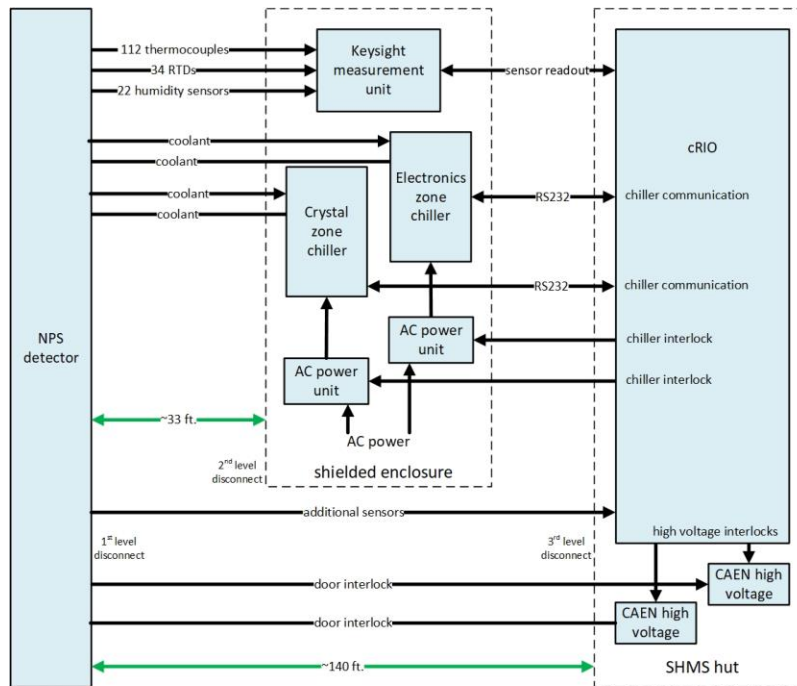
- ★ Each set of measurements was preceded by a background measurement that was then used in analysis

Mirror	Position	Lowest d0 Observed [mm]	Fit d0 [mm]	Fit Mirror Radius of Curvature [mm]
5C	horizontal	2.008	2.16	2708.23
5C	vertical	2.989	3.01	2702.15
5	horizontal	2.468	2.81	2709.8
5	vertical	2.670	2.69	2704.26

## Hall C – NPS

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

- Imported 36x30 model of PbWO<sub>4</sub> crystal array with copper shell and dividers from NX-12 into Ansys – debugging meshing issues
- Installed PyVISA and python-vxi11 packages to enable direct communication with the Keysight switch/mainframe via Python script – able to query mainframe identification number using both packages
- Generated Visio drawing of instrumentation connections in the additional radiation shielding area



NPS Shielded Area Connections  
M. A. Antonioli  
10/4/2021

Visio drawing of NPS shielded area connections



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- Fabricating high voltage supply cable voltage test chassis – soldered wires to banana sockets and stripped wires on meter end of cable
- Continued work on reflective film pre-shaping for  $\text{PbWO}_4$  crystals – film is wrapped around an aluminum form and baked in an oven for about one hour

## **EIC**

*Pablo Campero, Brian Eng*

- Constructing model of beam pipe in Ansys for thermal simulations
  - ★ Due to meshing issues with imported model, using NX-12 to draw basic model of the beryllium pipe
- Presented talk on sub-detector status of the Silicon Tracker for the Office of Project Assessment status review

## **DSG R&D – SoLID**

*Pablo Campero*

- Developing HMI programming
  - ★ Created and configured HMI server
  - ★ Tested communications between emulated PLC controller and HMI server by creating testing PLC tags
- Developing PLC programming to simulate PID control over the valves
  - ★ Added 1756-IF16 analog input module to the PLC project so the simulation program will be able to receive signals from IO hardware

## **DSG – Safety**

*Marc McMullen*

- The moisture sample of the cleanroom was cancelled due to the inability to source a self-leveling epoxy finish
- The moisture permeable finish will be used
- Facilities is in the process of contracting the job
  - ★ Proposed job dates are 11/01/2021 – 11/12/2021 from start to finish