



DSG NPS Status Update

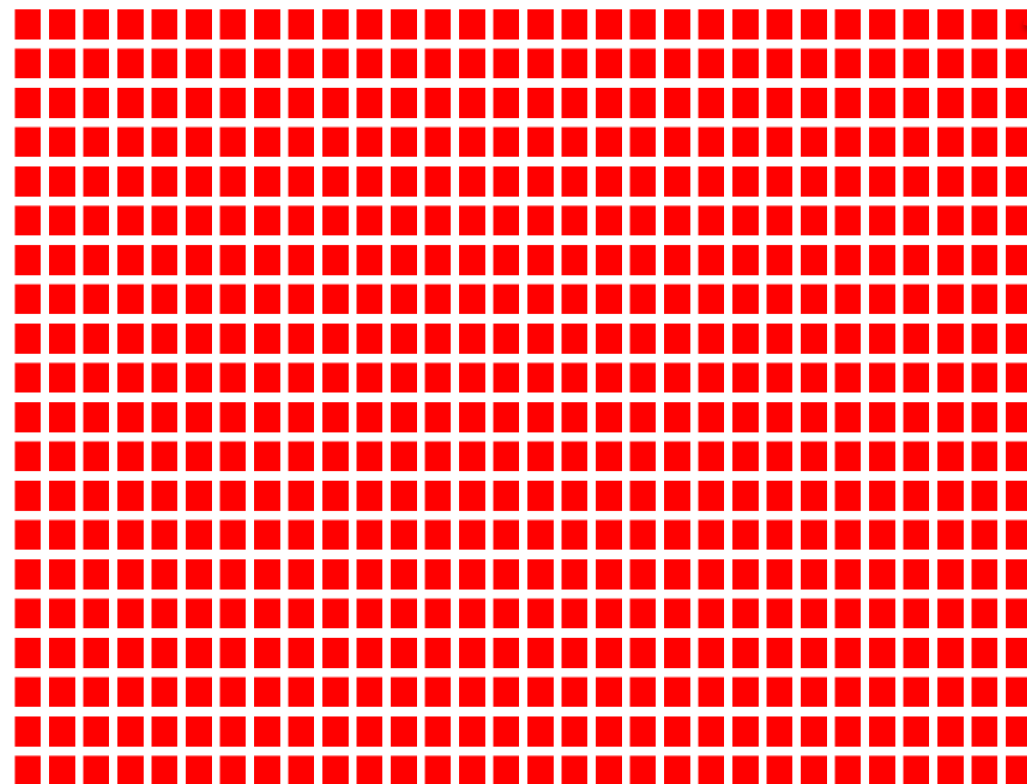
Aaron Brown and the
Detector Support Group
April 14, 2022

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EPICS Phoebebus High Voltage Controls

NPS Overview

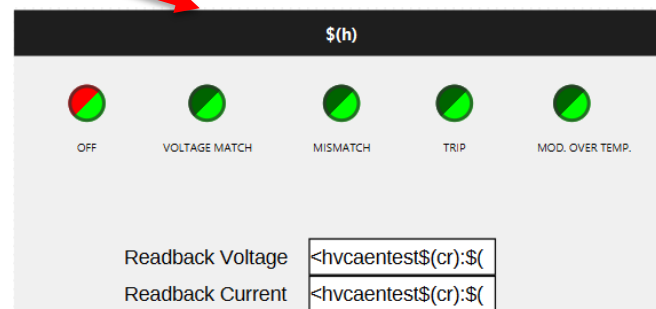


■ OFF
■ ON
■ FAULT

TRIP RESTORE

CAEN MODULE
TEMPERATURES















PMT status screen
displays readback
voltage and current



Buttons to open screens for trip
restore and module temperature
monitoring

- Each clickable block represents a high voltage channel
- Clicking a block opens a PMT status screen

EPICS Phoebebus High Voltage Controls

Row 35	00-35 	01-35 	02-35 	03-35 	04-35 	05-35 
Voltage [V]	<hvcaente...	<hvcaentest...	<hvcaente...	<hvcaente...	<hvcaentest...	<hvcaente...
Current [uA]	<hvcaente...	<hvcaentest...	<hvcaente...	<hvcaente...	<hvcaentest...	<hvcaente...
Row 34	00-34 	01-34 	02-34 	03-34 	04-34 	05-34 
Voltage [V]	<hvcaente...	<hvcaentest...	<hvcaente...	<hvcaente...	<hvcaente...	<hvcaente...
Current [uA]	<hvcaente...	<hvcaentest...	<hvcaente...	<hvcaente...	<hvcaente...	<hvcaente...
Row 33	00-33 	01-33 	02-33 	03-33 	04-33 	05-33 
Voltage [V]	<hvcaente...	<hvcaente...	<hvcaente...	<hvcaente...	<hvcaente...	<hvcaente...
Current [uA]	<hvcaente...	<hvcaente...	<hvcaente...	<hvcaente...	<hvcaente...	<hvcaente...
Row 32	00-32 	01-32 	02-32 	03-32 	04-32 	05-32 
Voltage [V]	<hvcaentest...	<hvcaente...	<hvcaentest...	<hvcaente...	<hvcaente...	<hvcaentest...
Current [uA]	<hvcaentest...	<hvcaente...	<hvcaentest...	<hvcaente...	<hvcaente...	<hvcaentest...
Row 31	00-31 	01-31 	02-31 	03-31 	04-31 	05-31 
Voltage [V]	<hvcaentest...	<hvcaentest...	<hvcaentest...	<hvcaente...	<hvcaente...	<hvcaentest...
Current [uA]	<hvcaentest...	<hvcaentest...	<hvcaentest...	<hvcaente...	<hvcaente...	<hvcaentest...

\$(h)

OFF

STATUS

Set voltage

<hvcaentest\$(cr

Set current limit

<hvcaentest\$(cr

CONFIRM

Clicking on rectangle, e.g. 00-35, opens above screen to set voltage level and current limit

- A portion of readback voltage and current screen for all 1080 PMTs

EPICS Phoebebus High Voltage Controls

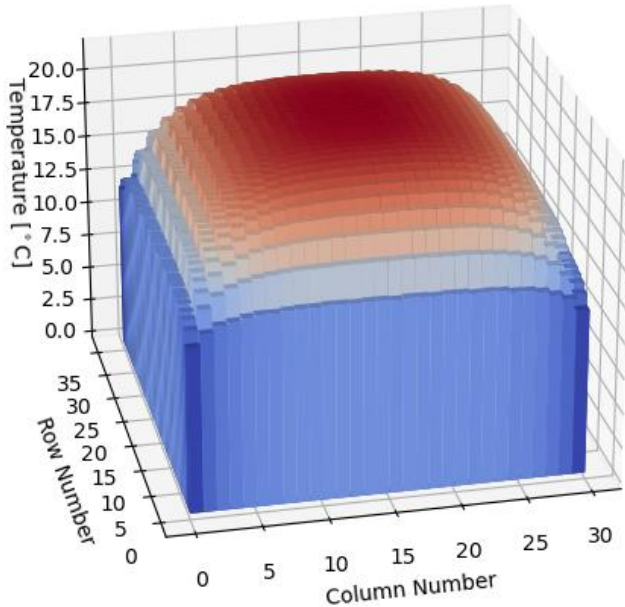
- Monitors internal CAEN modules' temperatures
- LEDs indicate module power status
- Modules can be turned on and off manually by clicking the on/off buttons

CAEN MODULE TEMPERATURES

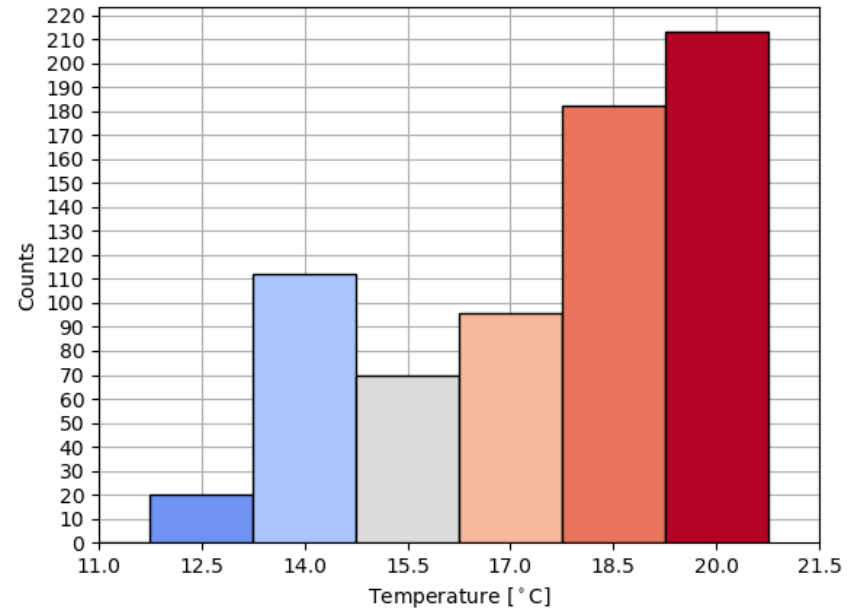
HVCAENTEST2					HVCAENTEST3				
<input type="checkbox"/>	ON	SLOT 0	<hvcae	OFF	<input type="checkbox"/>	ON	SLOT 0	<hvcae	OFF
<input type="checkbox"/>	ON	SLOT 1	<hvcae	OFF	<input type="checkbox"/>	ON	SLOT 1	<hvcae	OFF
<input type="checkbox"/>	ON	SLOT 2	<hvcae	OFF	<input type="checkbox"/>	ON	SLOT 2	<hvcae	OFF
<input type="checkbox"/>	ON	SLOT 3	<hvcae	OFF	<input type="checkbox"/>	ON	SLOT 3	<hvcae	OFF
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<input type="checkbox"/>	ON	SLOT 5	<hvcae	OFF	<input type="checkbox"/>	ON	SLOT 5	<hvcae	OFF
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<input type="checkbox"/>	ON	SLOT 7	<hvcae	OFF	<input type="checkbox"/>	ON	SLOT 7	<hvcae	OFF
<input type="checkbox"/>	ON	SLOT 8	<hvcae	OFF	<input type="checkbox"/>	ON	SLOT 8	<hvcae	OFF
<input type="checkbox"/>	ON	SLOT 9	<hvcae	OFF	<input type="checkbox"/>	ON	SLOT 9	<hvcae	OFF
<input type="checkbox"/>	ON	SLOT 10	<hvcae	OFF	<input type="checkbox"/>	ON	SLOT 10	<hvcae	OFF
<input type="checkbox"/>	ON	SLOT 11	<hvcae	OFF	<input type="checkbox"/>	ON	SLOT 11	<hvcae	OFF
<input type="checkbox"/>	ON	SLOT 12	<hvcae	OFF	<input type="checkbox"/>	ON	SLOT 12	<hvcae	OFF
<input type="checkbox"/>	ON	SLOT 13	<hvcae	OFF	<input type="checkbox"/>	ON	SLOT 13	<hvcae	OFF

Ansys Thermal Analysis

Crystal Temperatures - Front (0 W, 10 °C Cu Shell)

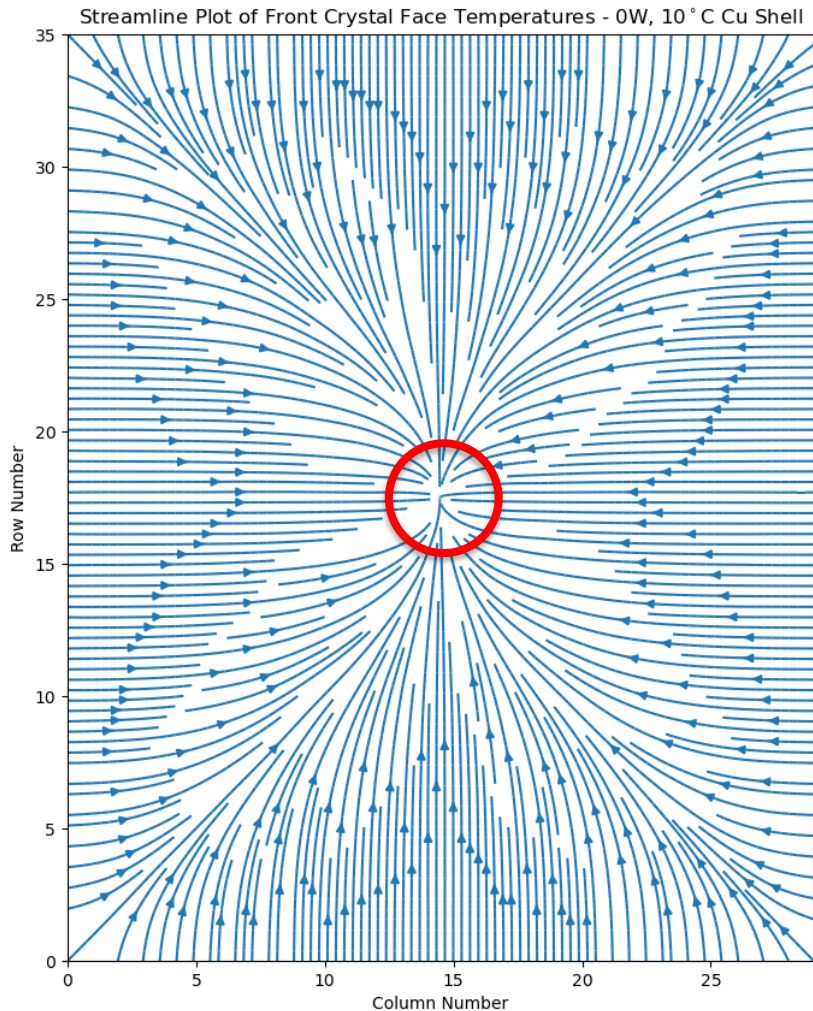


Front Crystal Face Temperatures - 0 W, 10 °C Cu Shell



- About 210 crystals in the central zone between 19.0°C and 20.5°C
- Due to cooling, peripheral crystals are between 11.5°C and 13.0°C
- Ambient temperature is 22.0°C

Ansys Thermal Analysis



- Streamline plot of the heat flow gradient
- Heat flow to the peripheral crystals is indicated in this plot
- Arrows are from low to high temperature

Conclusion

- DSG is developing high voltage EPICS controls
 - Need to be tested
- Ansys thermal analysis of crystal array in progress

Thank You!