

## DSG-NPS R&D Meeting Minutes

**Date:** July 27, 2021

**Time:** 11:00AM – 12:30 PM

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

### 1. Reviewed minutes from 07/20/2021 meeting

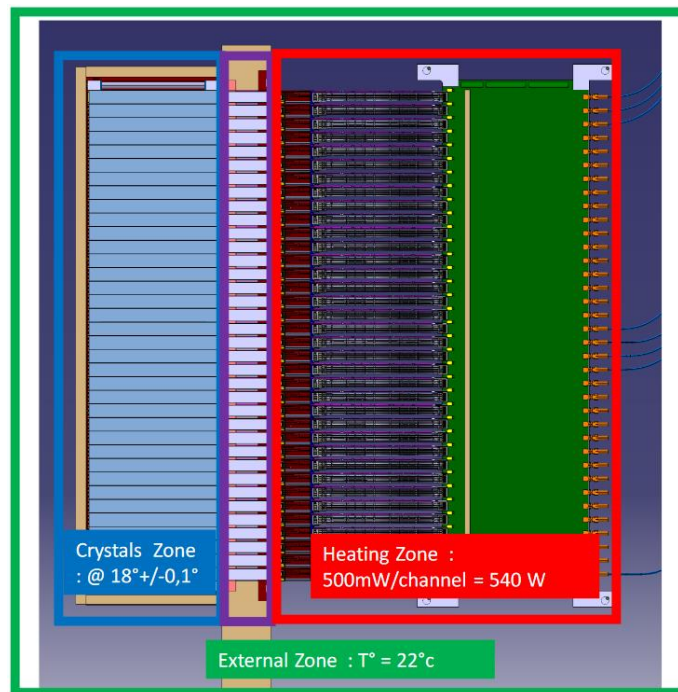
DSG

1. [07/20/2021 DSG-NPS R&D Meeting Minutes](#)

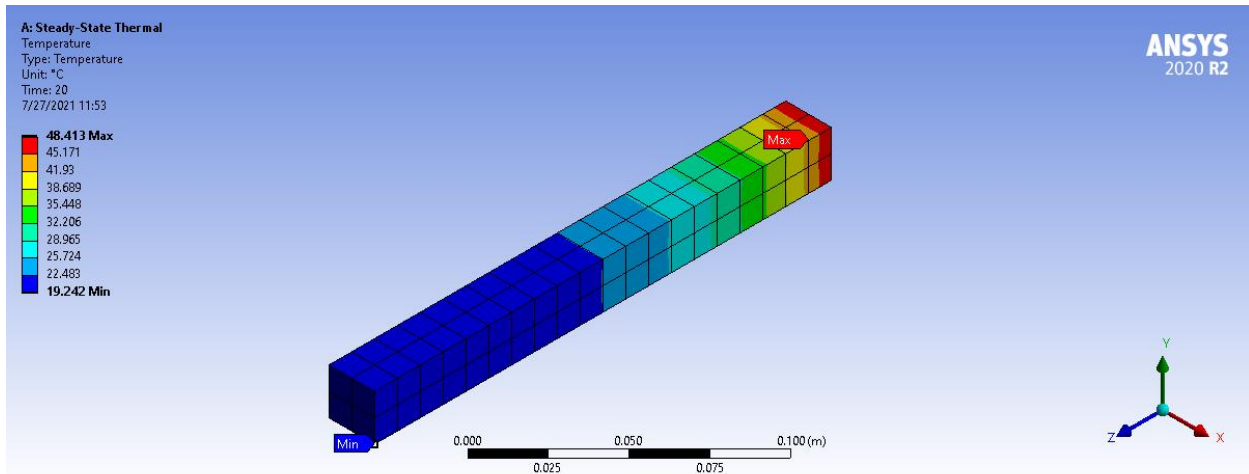
### 2. Thermal analysis and Ansys simulation

Aaron Brown

1. Reviewed Ansys steady-state thermal simulation of one block of  $\text{PbWO}_4$  crystal
  - Using assumed total heat load of 540 W for the heating zone as shown in the figure below (with all heat being transferred from the high voltage dividers directly to the crystal), a 0.5 W heat load was applied ( $540 \text{ W}/1080 \text{ crystals} = 0.5 \text{ W}$ )
  - A new convection, with a film coefficient of  $5 \text{ W/m}^2 \text{ }^\circ\text{C}$ , was used for the top and bottom of the crystal; the convection method “stagnant air: vertical planes” was used for all other sides.



Expected temperature and/or heat for each detector zone from [NPS ERR 2019](#) talk by Carlos Munoz



Steady-state thermal analysis of single PbWO<sub>4</sub> crystal with 0.5 W applied to rear face

2. The steady-state thermal simulation will be repeated using the 3x3 block of PbWO<sub>4</sub> crystals and 0.5 W, along with the original convection method (stagnant air: vertical planes) for all crystals
3. A graph of W vs T will be generated to show how the temperature changes depending on the amount of heat is applied to the crystal

### 3. HV supply cable testing

*Peter Bonneau, Aaron Brown, Brian Eng, George Jacobs, Mindy Leffel, and Marc McMullen*

1. Five male pins have arrived from CAEN
  - Using these pins, the Radial connector will be connected to a voltage calibrator and the voltage will be read via a DMM connected to the flying leads on the other cable end
2. Two sticks of hot glue for potting the Radial connectors have arrived from CAEN
3. Aaron Brown ordered an alternative hot glue and glue gun
  - Will test the hygroscopic properties of this glue using an Environmental Test Chamber or by leaving a sample outdoors, but not in direct sunlight
4. A MySQL database has been created for the CAEN high voltage module testing analysis plots
  - Two columns will be added—a comments column and a date of testing column
  - Another database will be created for the high voltage supply cable testing analysis plots
  - George Jacobs will complete the databases