

DSG Ansys R&D Meeting Minutes

Date: November 9, 2023

Time: 2:00 PM – 2:30 PM

Attendees: Peter Bonneau, Pablo Campero, Brian Eng, George Jacobs, Tyler Lemon, and Marc McMullen

1. NPS thermal analysis with Ansys Mechanical

Aaron Brown

1. Meshed model with crystal array, cooling plate, and dividers
 - Since crystal meshing was too coarse, used *Face Sizing* method to generate a finer mesh for the crystals
 - Total mesh cells 1,839,998
2. Simulation has been running on PHYCOMP2 for more than 24 hours and it's at 37%

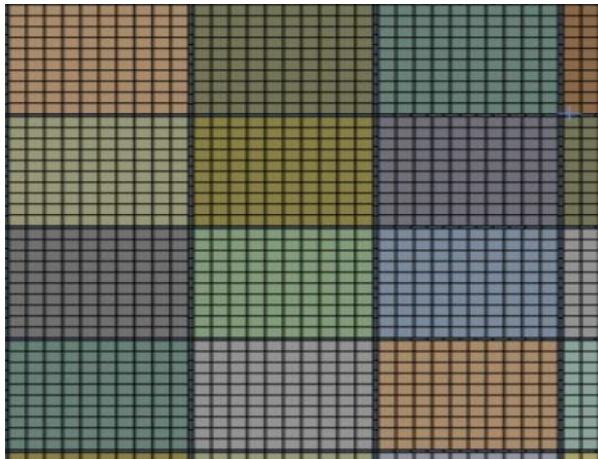


Fig. 1. Screenshot of portion of crystal array mesh

2. NPS thermal analysis with Ansys Fluent

Pablo Campero

1. Using SpaceClaim software drawing tools, generated figure of crystal #522 with dimensions and region labels
 - Added colors to each component
2. Re-ran thermal simulation on crystal #522 to get temperature contour plots in right side view

3. EIC beampipe Ansys Fluent thermal analysis

Pablo Campero

- Discussed graphics display issue with Ansys Mechanical Mesh software when using PHYCOMP2 computer remotely
- Opened the same Ansys project file on EXPCAMPERO PC (not remotely) and did not have the issue
2. Reworking mesh due to issues found during first attempt of simulation
 - Added multizone option and removed face sizing options to improve mesh of the aluminum parts of the model

- For the beryllium pipe
 - Utilized sweep method and size option to achieve two layers in the thickness of the beryllium pipe
 - Changed the mesh cell divisions in the z -axis direction from 10 to 200 divisions
- Used automatic method to mesh the inner volume of the beampipe

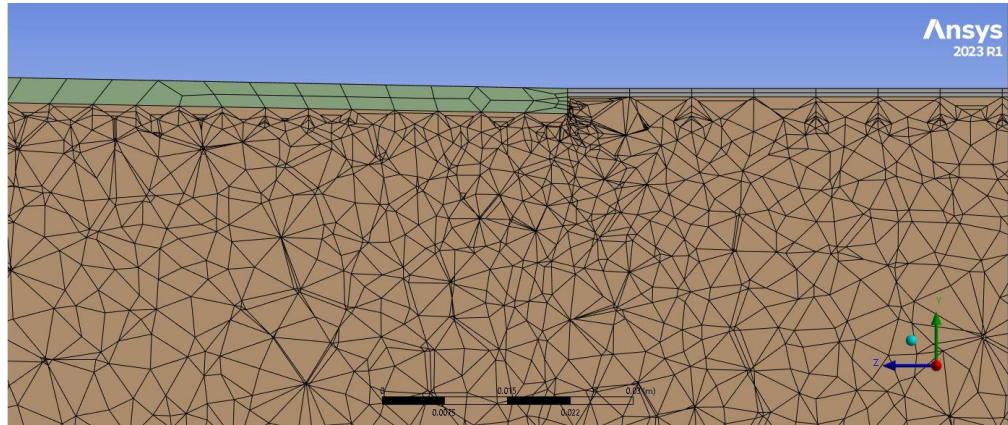


Fig. 2. Close-up view, cross-section, of the meshed model for the beryllium, aluminum and inner air fluid sections

3. Completed setup of materials thermal properties and boundary thermal conditions
4. Ran simulation and resulting temperature values are still not correct; investigation in progress