

DSG Ansys R&D Meeting

Date: May 18, 2023

Time: 2:00 PM – 2:30 PM

Attendees: Aaron Brown, Pablo Campero, Brian Eng, Marc McMullen, Tyler Lemon, and Amrit Yegneswaran

1. NPS detector thermal analysis

All

1. Determined Ansys Fluent steady and transient analysis conditions for model with a single block and with individual blocks
2. Amrit Yegneswaran assigned all Fluent thermal analysis to be done by Pablo Campero

2. EIC beampipe test stand thermal analysis

Pablo Campero, Brian Eng, and Marc McMullen

1. Made modifications to the 3D model in SpaceClaim
 - Combined air inlets with annulus space volume to ensure proper contact
 - Generated selection names for inputs and outputs
2. Completed meshing of the model in Ansys Fluent with Meshing software; improved surface mesh for model
3. Completed setup of the boundary and cell conditions
4. Ran simulations
 - Generated velocity and temperature contour plots
 - Ansys Fluent simulation showed $\sim 18^{\circ}\text{C}$ higher temperature in silicon pipe than measured in the test stand
 - Discussed possible causes for higher temperature in the simulation
 - Will re-do the cap (represents the O-ring used in the actual test stand) of the SpaceClaim 3D model so that it covers only the annulus and not all components
 - Will use rubber silicon material for cap component, which will not transfer heat to the other components

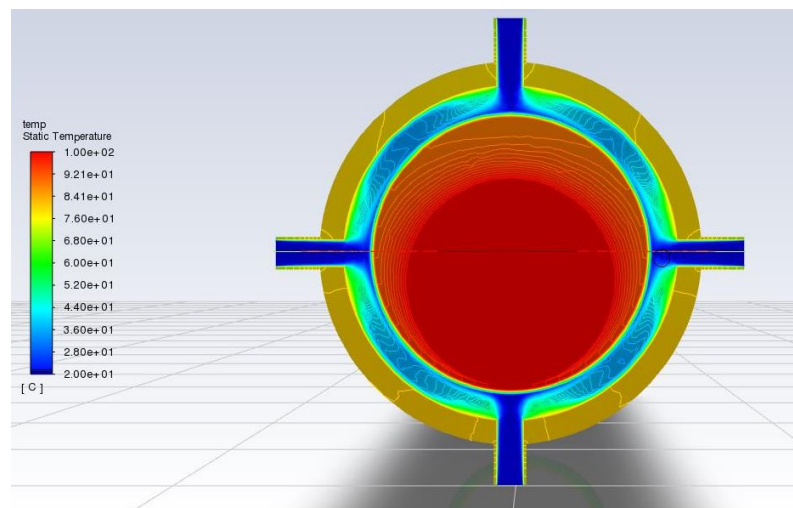


Fig.1. Back view, XY plane of temperature contour plot

5. Brian Eng will provide thermal properties of the aerogel layer used in the test stand