DSG-Ansys R&D Meeting Minutes

Date: April 28, 2022
Time: 14:00 to 15:00

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

1. ## NPS thermal analysis
   Aaron Brown, Pablo Campero, Brian Eng, and Marc McMullen
   1. Discussed geometry and dimensions for each zone of the model under analysis
      - Defined electronic zone and crystal zone volumes
      - Generating a simplified diagram showing isometric, front, and top view for defined zones on the model
   2. Ran steady-state thermal simulation for model without heat exchangers heat removal effect
      - Model includes detector frame (box), electronic zone volume, and air volume surrounding electronic zone volume
      - Detector frame defined as solid domain and electronic zone and air volume as fluid domains
      - Set internal heat generation for the electronic zone of 982 W/m3
      - Applied convection for the electronic volume at 20°C with a film coefficient of 5 W/m2*C
      - Generated section plane to display temperature profile inside the electronic volume
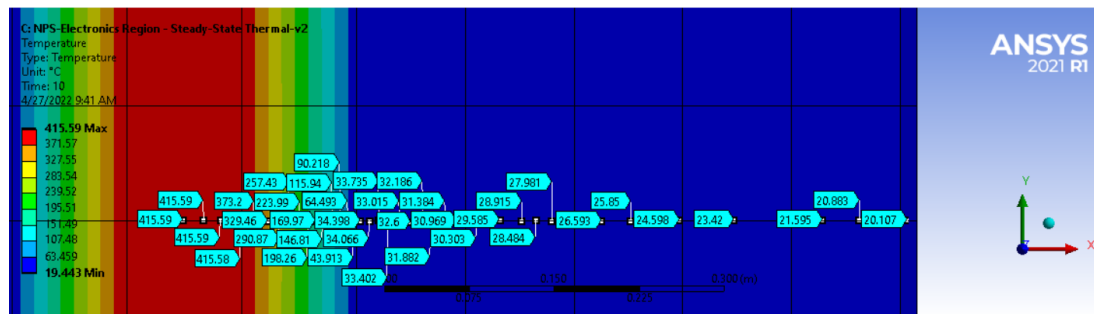

Fig.1. Preliminary steady-state thermal simulation results for model without heat exchangers, only internal heat generation due to the electronics

   3. Implementing model to *Ansys Fluid Flow Fluent* software
      - Discussed the assignment of boundary conditions, inlet and outlet sections for the model
      - Marc McMullen will modify the simplified model for the heat exchangers (top and bottom) in electronic zone. Will add two cylinders to represent the fans for each heat exchanger.
        - Dimensions of the cylinders will be based on original geometry of the fans