DSG Ansys R&D Meeting

Date: April 20, 2023
Time: 2:00 PM – 2:30 PM

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

1. **NPS detector volume thermal analysis**
   Pablo Campero and Brian Eng
   1. Discussed thermal simulation for the model that includes the fan interaction with the detector's volume
      - Contacted Ansys tech support to solve issues with model
        – Used Ansys Fluent with Mesh for meshing the model
        – Added cylindrical wall for fan with dimensions based on specs
        – Used shared topology approach
      - Imported model into Fluent
      - Configured material properties for fluid and solid parts
      - Set up cell zone conditions
        – Fan angular velocity of 1500 RPMs
        – Heat source for crystal block of 3530 W/m^3
        – Random heat removal for heat exchanger fin section of -100 W/m^3
      - Ran steady state solver simulation
   2. Reviewed velocity and temperature contour plot for the simulation
      - Temperature plot shows incorrect high temperature values
      - Velocity plot shows correct flow direction
   3. Reviewing model geometry, configurations, and adding boundary conditions to improve simulation
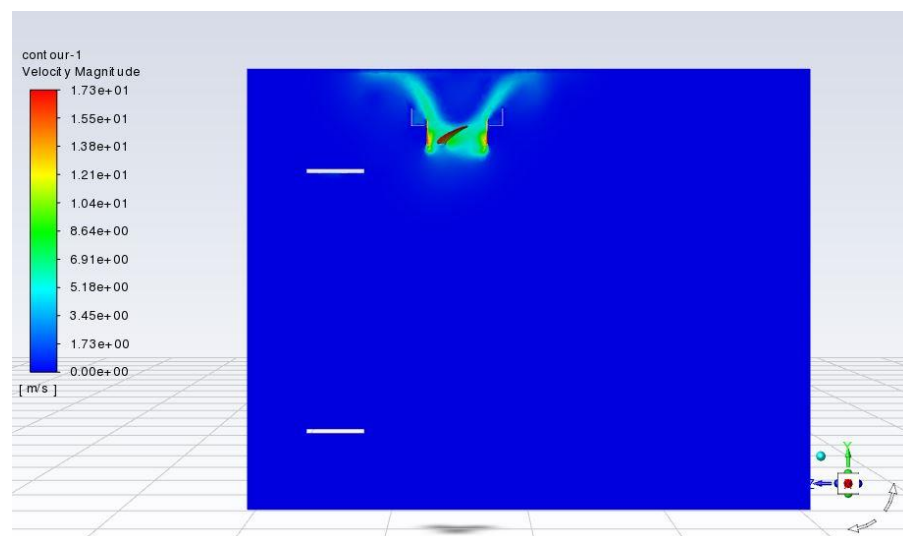   - Brian Eng suggested measuring the flow rate in the fan input and comparing with the fan specifications

Fig.1. Velocity contour plot for initial setup