

## DSG Ansys R&D Meeting

**Date: April 13, 2023**

**Time: 2:00 PM – 2:30 PM**

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

### **1. Discussed NPS heat simulation**

*Aaron Brown, Pablo Campero, and Brian Eng*

1. Worked on the thermal simulation for the model that includes the fan interaction with the detector's volume
  - Using SpaceClaim Design Modeler software, generated 3D model of the NPS detector
    - Based on the model build by Marc in NX-12 software
    - Removed individual crystals blocks, crystal's supports, and three fans
    - Using Boolean features on design modeler, generated rotating volume, which includes the fan volume and the blades
    - Created a volume inside the entire detector enclosure and then combined it with each inner component/volume of the model
    - Ensured that inner volume geometry contains internal walls
    - Resolved interference between heat exchanger plates and electronics volume
  - Meshed model
  - Imported model to Fluent and ran simulation; had unexpected temperature values
    - Checking model geometry and errors
    - Contacted Ansys technical support
2. Aaron ran transient mode simulation for crystal array
  - Plotted average temperature vs time for a period of 48 hours.
    - Ambient temperature was held constant at 20°C
  - Average temperature for the crystals was 15°C, which is different from the temperature in the steady state analysis mode
    - Investigation is ongoing