DSG Ansys R&D Meeting Minutes

Date: September 21, 2023
Time: 2:00 PM – 3:30 PM

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

1. **NPS thermal analysis with Ansys Mechanical**
   Aaron Brown, Pablo Campero, and Brian Eng
   1. Accessed SpaceClaim license with no problems
   2. Verified geometry of the model in SpaceClaim
      - Detected overlapping faces on the model geometry
      - Resolved overlapping using interference tool, which detects and fixes interfering bodies
      - Applied share topology to ensure that surface and edges are in contact for thermal interaction
      - Unable to mesh

2. **NPS thermal analysis with Ansys Fluent**
   Pablo Campero
   1. Ran simulation for 500 iterations, resulting in same high temperature spots as 1000 iterations
   2. Contacted Ansys technical support and followed recommended Fluent setup
      - Changed boundary conditions for each crystal rear wall from heat flux option to shell conduction and coupled with heat source of 750,000 W/m3
      - Enabled High Order Term Relaxation under solution methods option
      - Changed initialization mode from hybrid to standard
   3. Started third simulation with 1000 iterations in steady state mode
      - From the report definition plots that are available while simulation is running, noted that maximum temperature for crystals was above 30°C
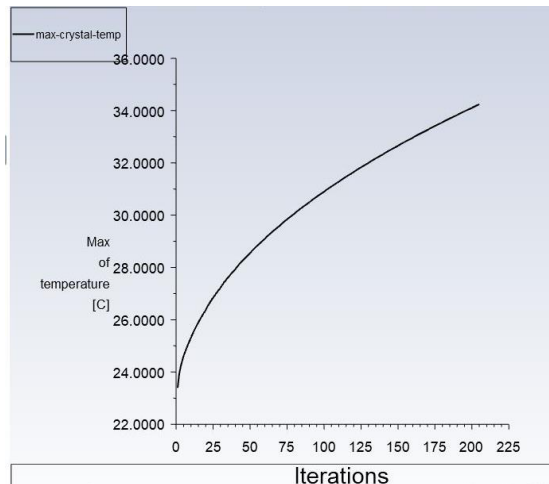   - Stopped simulation (iteration #200) and checking results

Fig. 1. Maximum crystal temperature report definition plot during simulation