DSG Ansys R&D Meeting Minutes

Date: October 26, 2023
Time: 2:00 PM – 3:00 PM

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

1. **NPS thermal analysis with Ansys Mechanical**
   Aaron Brown
   1. Meshing model with crystal array, cooling plate and dividers
      - Meshing process stops at 5%
      - Ansys support made recommendations
        – Disable the Share Topology option in SpaceClaim software
        – Set bounding contact for all regions in contact
        – Change the physics preference from CFD to Mechanical
      - Applied recommended changes but still stops at 5%
      - Model's geometry and mesh files sent to Ansys support for revision

2. **EIC beampipe Ansys Fluent thermal analysis**
   Pablo Campero
   1. Set up model materials and boundary conditions in Fluent
      - Included materials for beampipe and insulation
      - Air flowing from left to right with 100°C at the inlet section
   2. Added three layers of insulation—80 μm of polyimide, 0.1 μm of aluminum, and 80 μm of aerogel
   3. Re-working the mesh due to issues during first attempt of simulation
      - Monitored velocity and energy residuals
      - Solution in steady mode did not converge after 300 iterations
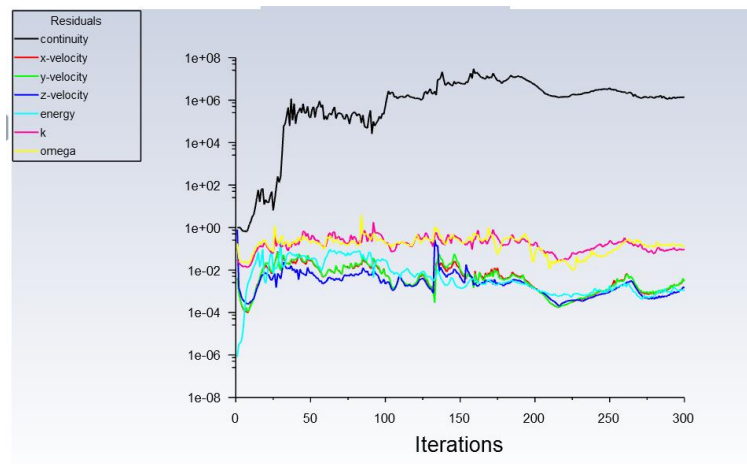   - Maximum temperature result for beryllium pipe showed incorrect values > 4500°C

Fig.1. Ansys Fluent residuals monitored during simulation