

# Project Progress Report

## **Student Name(s):**

Sujit Kumar Kamaraj (u1466410), Mukunth Balaramachandran Srinivasan (u1467270)

**Project title:** Convection in Earth's Mantle - A Visualization

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**Estimate the percentage of the overall project you have completed thus far.  
What have you completed?**

Around **40%** of the overall project has been completed so far.

**Completed:**

- Data exploration and preprocessing, familiarizing with the structure and content of the dataset.
- Initial visualizations focusing on temperature, velocity, and density anomalies (using surface rendering).

**Some initial results:**

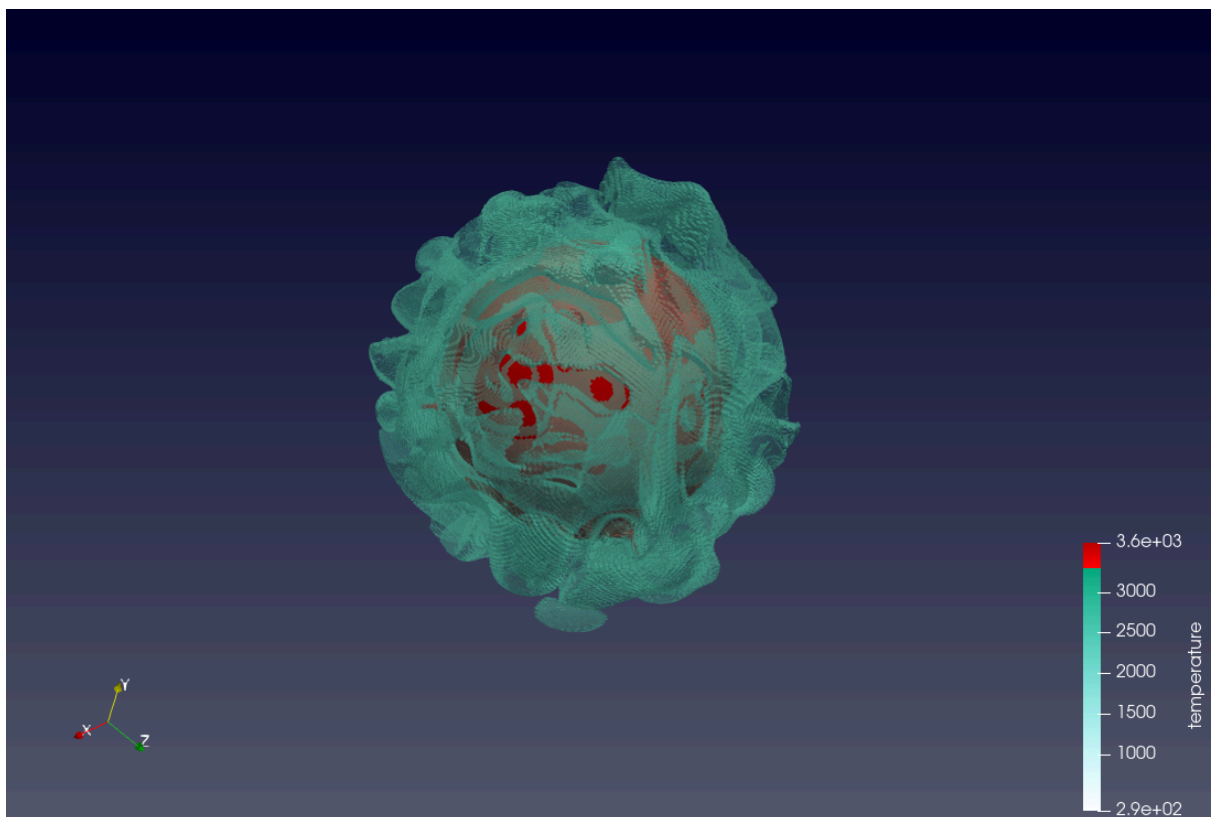


Fig 1. High vs.Low Temperatures

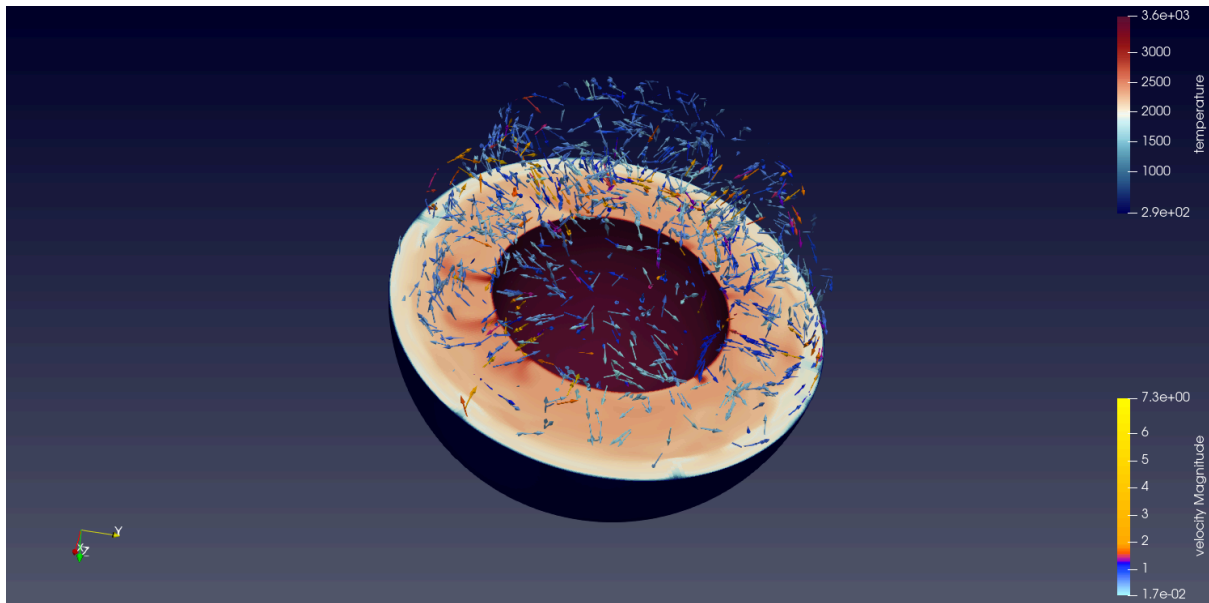


Fig 2. Velocity glyphs vs. Temperature of surface & core

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**Create a list of what still needs to be done on the project and estimate the effort each item will take to complete.**

- Development of dynamic visualizations illustrating temporal evolution and spatial distribution of anomalies.
- In-depth analysis of spin transition-induced density anomalies and their correlation with mantle dynamics.

These will involve using volume rendering (using CHPC systems), which we hope to complete in a few weeks.

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**Have you had to make any changes to your project description? If so, please list and justify the changes.**

No changes have been made to the project description so far.

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**Any additional information?**

To complete the above-mentioned analyses, we will be utilizing CHPC systems to render volume rendering, since our data size is enormous.

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