Review of: "Dynamic structure factors and equation of state of fluid iron under Earth’s core condition"

Diyar Nasih Qader[1]

1 Cihan University

Potential competing interests: No potential competing interests to declare.

This paper explains geodynamo's involvement in Earth's fluid iron outer core. The equations of states and ion-ion dynamic structural factors for pure iron in Earth's core are computed using ab initio molecular dynamics. They match in situ x-ray diffraction and inelastic scattering data. We present a multivariate polynomial method for accurate equations of states and direct calculation of pressure- and temperature-dependent thermoelasticity. Iron's isentropic profiles in Earth's outer core have 10% higher density, 7% lower sound velocity, and nearly identical adiabatic bulk modulus than the preliminary reference Earth model. The fitted equation of state produces 5% lower sound velocity than dynamic structural factors, although adiabatic sound velocities are similar.

Although you have done a good job on the manuscript, the following revisions are necessary to make it even better:

1. Please add a flowchart summarizing the methodology of this research.
2. The figures and their legends are unclear. It is recommended to increase and improve the resolution of the figures.
3. It is recommended to enhance the conclusion section by providing a point-by-point summary of the manuscript.
4. Some of the references are old. It is recommended to use up-to-date references (i.e. last five years).