

Interactive comment on “A new open-source visco-elastic Earth deformation module implemented in Elmer (v8.4)” by Thomas Zwinger et al.

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The module proposed in this article is a good alternative in modeling Glacial Isostatic Adjustment (GIA) because it takes advantage of an open-source and free FEM package Elmer. The article is well written with a clear structure. I can support publishing the article if the author can provide more details of the method and more benchmark tests:

In section 2, what are the boundary conditions on internal boundaries and external surface for a flat Earth model and how are they implemented in the model? In terms of solving Equation (9), what are the detailed form of the test and weighting functions

C1

and what is the integration method?

In section 3, when doing benchmark tests, it is more convincing that if the numerical solution can be compared with the analytical or semi-analytical solution. Therefore, it is good to compare the result from Elmer/Earth with that from normal-mode method for a Heaviside single harmonic load and a flat Earth model.

Below are some small issues:

Figure 1 and Figure 2: font size on axes is too small. Line 148: why does a high viscosity (e.g. 1×10^{14} Pas) in Lithosphere enables an approximately elastic behaviour? Why the viscosity of upper and lower mantle are set to be 1×10^{18} Pas and 1×10^{22} Pas respectively?

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C2