

Chère Collègue,

I have now received the evaluation of two referees on the new version of your paper. The referees are the same as those of the first version. In particular, referee 1, who has now let his name known, is Jeffrey Anderson.

Both referees suggest acceptance of your paper as it is. Jeffrey Anderson adds comments on the question of localization. I follow their opinion, and accept the paper. I however suggest, as editor, two corrections.

1. It seems that the parameters that are introduced in subsection 2.1 (*Mantle convection model*) are not all properly defined. For instance, I understand that a^E (p. 5, l. 28) is the same as a (p. 4, l. 13), *i.e.* $r_a - r_b$ in Table 1. Please check carefully that all parameters are properly defined, and their numerical values specified.

2. You write (p. 7, ll. 18-19) *We choose to include in the state the whole temperature field, but also add the surface velocities, to form an augmented state vector,* I understand that this means that the analyzed surface velocities are used only as diagnostic quantities, and have no impact on the sequel. But it also means that the analyzed temperature and surface velocities are not linked by Eqs (1-2). If so, say it clearly. If not, explain.

I thank you for having submitted your paper to *Nonlinear Processes in Geophysics*, and look forward to receiving your final version,

Cordialement,

Olivier Talagrand
Editor
Nonlinear Processes in Geophysics