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Interactive comment on "Total energy norm in NWP closure parameter optimization" *by* P. Ollinaho et al.

Anonymous Referee #1

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Comments on Total energy norm in NWP closure parameter optimization By Ollinaha et al.

This paper is about using (dry) total energy norm with EPPES. The results clearly indicate the usefulness of the norm in tuning the parameters and should be published in GMD. However, I do have a few comments on the manuscript and hope the authors can address them before the final publication of the paper.

The title does not make much sense to most readers. Something about EPPES, or related, should be there.

Should have "dry" in front of total energy norm throughout the paper. Discuss or even speculate how much the moisture part can influence the results and conclusions. Also

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when kinetic energy is used, please explain why not use the dry total energy.

As this is based on the previous work using other norms, it would be nice to show some comparison results, which can demonstrate the superiority of the energy norm.

I guess the energy norm can also computed over a limited area and a selected vertical range. I know many people try to find a universal number for a model parameter over the whole globe, but I guess we may have to use different numbers for different areas. Some discussion may be useful, especially in connection with the regional degradations.

All readers need to read previous EPPES papers in order to read this paper. Is EPPES really well-known?

Eq (2). Should there be a delta_p or delta_sigma in the vertical summation to give proper weights to different model layers? At least some comments should be offered on why they can use the same weight for different layers for the total energy computation.

"The impact of initial state and parameter perturbations separately ... (not shown)." Why not? It is quite interesting.

Fig.1. What is the unit for energy norm?

Fig.2. Where is the shading scale? May need to use colors. Units?

Fig.3. Units?

Fig.4. Units? Are these large or small differences?

Fig.5. Too small.

Fig.6. Why not dry total energy?

Fig.7 Too small.

Interactive comment on Geosci. Model Dev. Discuss., 6, 6717, 2013.