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Interactive comment on "The Kenya Rift revisited: insights into lithospheric strength through data-driven 3D gravity and thermal modelling" *by* Judith Sippel et al.

G. Peron-Pinvidic (Editor)

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This manuscript fits very well the scope of SE contributions. It is clear, detailed and very well written. The study is original, new, well presented, very well referenced and should be of good interest to many of our colleagues. Two reviewers have listed various comments and recommendations (the 'RC' Referee Comments 1 and 2) that are very pertinent and should be highly useful to the authors to improve their contribution. As Editor, I have some additional recommendations:

1. I agree with the referees on the point that your initial model geometries should be better justified. Please add explanations, especially on how you defined your top-basement and the partition between your crustal layers. In that scope, please add

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Discussion paper

the KRISP profiles to your contribution (in the Appendix). These will help justifying your initial geometries and help the reader better understand the geological setting of the rift. You should also add information on the uncertainties regarding your input constraints and consequences for the your modelling approach (e.g. the geometries and thicknesses of your various layers). The density values in your input parameters are also crucial to your results. Please expand the explanations and justifications given on pages 5-7 regarding the density/velocity values : what are the uncertainties / error bars on the initial density/velocity values? how does that impact the model results and resolution? How the uncertainties of each input dataset have been handled in the final model? (e.g. values such as 6.325 km/s are extremely precise, is such precision realistic? what is the associated error bar?).

2. Please add a proper 'Geological Background / Tectonic Setting' section.

3. Your figures are very good, complete and clear, and very well referenced. I have only minor recommendations: - same comment as RC1: please add a title on each of the your figure so that the reader can easily and rapidly get what the maps are about. - please increase the font size of all your labels and texts (many of them will probably be difficult to read on the final version of the manuscript). - would it be possible to generate '3D perspective views' of your model? (e.g. with the topo/top-basement/Moho layers). That would help a lot the reader getting a good understanding of your geometries and of the rift configuration (to be placed for instance on the Figure 7?). - can you display the volcanoes on the Figure 8b as done for the Figure 6c? - add labels for your upper/basal crustal layers on Figure 9.

4. Your reference list is very complete. Many doi numbers are however missing. Coudl you carefully check and add the informtaion wherever needed?

Best regards, Gwenn Peron-Pinvidic Trondheim, November 9th 2016

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