

Interactive comment on “Fast sensitivity analysis methods for computationally expensive models with multidimensional output” by Edmund Ryan et al.

Anonymous Referee #3

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This manuscript presents different approaches to global sensitivity analysis for expensive (potentially large dimensional) models. In this respect this study is well done. I have just a few comments:

Page 4, lines 1-6: I think local sensitivity can be described better here. In this case the sensitivity is only analyzed along the nonlinear trajectories (locality). So the model is still nonlinear, the linearity is assumed for the perturbation.

Page 4, lines 7-12: I am not sure how thorough this analysis can be conceived. Depending on the community, people call sensitivity analysis either global or local implicitly. I would argue that this should be discussed in the analysis of the results as

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well.

Page 6, lines 10-15: Calibrating the emulator may not be a trivial task especially for a global search. This is an element that needs to be discussed in any case.

Page 16, line 17: an R^2 of 0.97 to 0.99 is quite high. This may be an indication of a mostly linear system (necessary but not sufficient). Have the authors looked at this aspect in some detail?

Figure S3 could benefit from adjusting the colormap.

Interactive comment on Geosci. Model Dev. Discuss., <https://doi.org/10.5194/gmd-2017-271>, 2017.