

Interactive comment on “Practical experience and framework for sensitivity analysis of hydrological models: six methods, three models, three criteria” by Anqi Wang and Dimitri P. Solomatine

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Providing insight and guidance for users of Global Sensitivity Analysis (GSA) in selecting the appropriate method for their situations is a very current and relevant issue. One thing that has certainly not been sufficiently assessed is how we can combine different approaches in a multi-method approach to GSA (e.g. discussion in Pianosi et al., 2016, EM&S). So, I think that there is some value to the work done here. There is also clearly some more work to be done by these authors as the other reviewers already mentioned and I will not discuss the same again here. Rather I am making some more suggestions for the authors to consider.

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[1] Reduce the content and more clearly focus the study. Certainly, I would avoid presenting a framework. I think that comparing methods in detail and discussing how they can and should be combined is much more valuable. We know they give different results, but how can we use this? See point [4] as well.

[2] Some of the conclusions in model selection are trivial or are not consistent with example studies already in the literature. For example, there are already quite a few GSA studies using variance-based approaches with distributed hydrological or environmental models (in contrast to the authors' third recommendation) (e.g. van Werkhoven et al., 2008, GRL).

[3] If the focus lies on convergence of these algorithms, then you should really assess this issue in great detail and study for example whether convergence depends on the catchment studies or other things that can be varied between model runs (such as different uncertainties in the input and output data).

[4] Figure 10 is a generic flowchart for GSA and as such more suitable for a review paper or a book chapter. I do not see how this advances on past work and would take it out. Focusing on what you can learn from applying these different methods would be much more valuable and interesting.

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