

Interactive comment on “Parameter uncertainty analysis for an operational hydrological model using residual based and limits of acceptability approaches” by Aynom T. Tweldebrahn et al.

Anonymous Referee #2

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The manuscript is in general well-written and in line with the scope of HESS.

The manuscript performs a parameter uncertainty analysis of a distributed hydrological model by means of two variants of GLUE. Specifically the authors apply one variant based on the residuals and other in the limits of acceptability. The paper has a good practical component. However, I think it can be potentially highly improved by refining with a more rigorous and formal perspective.

Here i provide some comments that can I think can help to strength the paper:

1. introduction Pag 1 Line 23: there is not reference to Statkraft model Line 27: 'equally good' needs some definition or explanation Line 32: 'less justifiable' I would advice to

be more rigorous Pag 2 Line 8: 'Uncertainty analysis classification'. more references are needed

In general, i think, introduction is missing references and explanations and more rigour in the scientific writing I think the introduction would be benefit from these.

2. Methods and materials Pag 3 Line 30 and first paragraph: if possible, provide more explanation to define PT_GS_K Pag 5. Line 20: variables? Line 35: in my opinion the reference to the link fits better at the end of the paper, together with the date when the authors acceded to the data - this is for readers being able to reproduce the study 2.3.1. this section needs to provide more description, i.e. to guide the reader 2.3.2. equation (5): if possible, i suggest to use other letter different to L, as it can be confuse a reader to the likelihood function (i.e. in statistics the likelihood function is $L(\theta_{\text{model}}|\text{data})$) I suggest to use a more formal notation

In general, i think section 2 would be improved by 1) making clear distinction about statistic language from what the GLUE approach uses - which is what this paper uses. I think this might help to a reader that is not familiar with the approach to use it in right way with no confusion. 2) providing a road map of the methodology to re reader - for repeatability purposes

3. Results and 4 Discussion Same comment as in my last paragraph, I suggest to avoid confusion, when possible. for example, in pag 13, line 38 'information content'. This should be used with caution, as it requires an approach to be evaluated.

Finally, in case the editor ask to the authors a reviewed manuscript, i am happy to review it again

Kind Regards, Reviewer

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