Response letter to reviews of the first revised hess-2021-514

"Pitfalls and a feasible solution for using KGE as an informal likelihood function in MCMC methods: DREAM(ZS) as an example"

Yan Liu, Jaime Fernández-Ortega, Matías Mudarra, Andreas Hartmann

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We thank the editor and reviewers for their comments that help us to improve our manuscript. In the following, the reviewer comments are shown in regular font, and our point-by-point replies are shown in italic and blue font. Upon revision we have made the following changes to the manuscript and Supplementary Material:

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1. *We updated Fig. 5c to be visually seen the difference between the results for formal and KGE_{gamma}.*

2. *We thoroughly changed Cl, NO3 and SO4 to Cl^-, NO_3^- and SO_4^{2-} in our revised manuscript.*

3. *We updated one affiliation of Yan Liu and Andreas Hartmann.*

15 ## Reply to the comments of editor

Suggested Revisions/Corrections by two referees have been included in version 2 of the manuscript. These modifications have been confirmed by Reviewer 1 and the editor. There are still some minor corrections to address. I agree with Reviewer 1 that results for the formal likelihood in Fig 5c) are unreadable. Can you improve this?

20 *We thank the editor for the comment. We have set a transparency for KGE_{gamma} in Fig. 5c. Now the small difference between formal and KGE_{gamma} can be visually seen. We also added a small embedded figure for a better local visualization. Please find the change in the revised Fig. 5c.*

Reply to the comments of reviewer #1, Jiangjiang Zhang

25 I appreciate the efforts made by the authors in answering my questions/comments. Now the quality of the manuscript has been greatly improved. A few final minor comments:

We thank the reviewer for the positive evaluation on our first revision.

1. Line 195: Cl->Cl^-, NO3->NO3^-, SO4->SO4^2-

30 *Response: We have revised this accordingly. We have thoroughly changed them in other places of the manuscript. We have updated them to Cl^-, NO_3^- and SO_4^{2-} in the captions, labels and titles of Fig. 8, 9, and S2.*

2. Figure 5(c): results of formal likelihood are not visible, try to improve the depiction.

Response: We have updated Fig. 5c, which is now readable for the difference between formal and KGE$_{gamma}$. Please also refer to our reply to the editor' comment.