

An argument for parsimony in differentiable hydrologic models

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Key

Black font: Reviewer comments

Bold blue font: Author responses

Dear editor,

We found both suggestions made by the reviewer helpful and have incorporated them accordingly into the revised manuscript. Please see our responses below.

- In Fig.4 because you are mainly comparing the models (line 314) and not the operational mode for each model, it would be better if the MLP and LSTM are next to each other. The two “columns” are then out-of-sample in time and out-of-sample in space, but each column contains the MLP and LSTM next to each other.

This was a helpful comment. We have reorganized the boxplots in Figure 4 in the revised manuscript according to the reviewer’s suggestion. The revised figure now provides more clearer comparison between the MLP and LSTM models for both out-of-sample evaluations.

- 527 – 547 could be an independent section for limitations, after the conclusions. That would make the conclusions smoother and then clearly establish the limitations in an independent section.

Thank you for this suggestion. We agree that the limitations should be more clearly distinguished from the primary conclusions. In the revised manuscript, we have therefore reorganized this material as a separate numbered item within the Discussion and Conclusion section. This preserves the numbered structure used to summarize the study’s main findings while clearly identifying the scope and limitations of those findings. We also revised the introductory text to the numbered list accordingly. We believe this change

improves the flow of the conclusions while giving the study limitations greater visibility and a clearer place within the overall discussion.