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Interactive comment on "A parallel workflow implementation for PEST version 13.6 in high-performance computing for WRF-Hydro version 5.0: a case study over the Midwestern United States" *by* Jiali Wang et al.

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We would like to express our deep appreciation to the two reviewers (Dr. Doherty and the anonymous reviewer) for the thoughtful comments and insightful suggestions. Working to resolve these comments helps us add lots of interesting science and add value to the manuscript.

The primary objective of this study, as pointed out by Reviewer #2, is to build a bridge for linking the parallel PEST and WRF-hydro on the basis of HPC clusters and explore

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the computational benefits of this bridge. We do not attempt to extensively assess each individual tool or address questions in each individual domain, such as optimizing the objective functions in PEST or calibrating WRF-Hydro to achieve the best set of model parameters. However, we appreciate the opportunity every much during the revision of this manuscript by learning more about PEST especially the method of regularization for calibrating environmental models. We are also very glad that the reviewers found the bridge we built useful for helping WRF-Hydro users with the long and tedious model calibration.

In the revised version of this manuscript, several major changes are made based on both reviewers' comments/suggestions. They are listed below:

1. We re-do the WRF-Hydro calibration using SVD-based regularization method in PEST.

2. We consider prior information for the calibrated parameters.

3. We also consider different weight for the stations that are calibrated, based on their inversed mean of discharges.

4. To test the computational benefits of the bridge, we design five experiments by assigning different amount of computing resource for parallel PEST and for parallel WRF-hydro.

5. To constrain the problem size due to the limits of computing resource, we reduce the number of calibrated parameters to 22 according to the model sensitiveness of this particular study.

Please find our one-on-one response in Supplement to each reviewer's comment. A complete list of the changes made for the revised manuscript can be found in the "track changes" version of the manuscript. A clean version of the revised manuscript is also attached at the end.

Sincerely,

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Please also note the supplement to this comment:
https://www.geosci-model-dev-discuss.net/gmd-2018-253/gmd-2018-253-AC1-supplement.pdf

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