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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Multiobjective sensitivity analysis and optimization of a distributed hydrologic model MOBIDIC" *by* J. Yang et al.

Anonymous Referee #1

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This paper presents a multiobjective sensitivity and optimization method to calibrate a distributed hydrologic model MOBIDIC for three objective functions. The paper is within the scope of HESS, and can be published after a minor revision.

1.A flowchart figure is suggested to add to clarify the methodology, i.e., the relationship between the two sensitivity methods.

2.The single objective optimization is performed with the Nelder–Mead Simplex algorithm, why not use the Genetic Algorithm and make the comparisons fairer. In fact, ε-NSGAII is also very effective for single objective optimization.

3.In section 5.2, the high flows are underestimated (that can be observed in Fig. 9) because the logarithm scale of the observed and simulated flows (SRMSE and MARD)

are chosen. It needs to justify that the purpose of the hydrologic model is not for the flood forecasting. Particularly, MARD seems to more address the normal flows.

4.In section 5, the authors used SDP method to discuss multiobjective sensitivity analysis quantitatively. This study did not give a threshold for the sensitivity index (vertical axisin Fig. 4) that the factors could be screened out clearly, i.e., has a very low sensitivity index (Fig. 4) while it is chosen as a sensitive factor.

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