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Discussions

Interactive comment on "Uncertainty analysis of floodplain friction in hydrodynamic models" *by* Guilherme Dalledonne et al.

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The authors present an interesting study of the variability of the velocity predictions of a 2-D hydrodynamic model related to the uncertainty of vegetated floodplain friction parameterisation. Four parameterisation models are tested using three uncertainty analysis methods. These methods include First Order Second Moment, Monte Carlo sampling and metamodeling (Non-Intrusive Polynomial Chaos).

My main concern is the misleading formulation of the problem. Namely, the authors introduce the term 'uncertainty' based on the error between simulated and observed variables (page 5, lines 19-26) and apply it to analysing the variability of the model output in the form of velocity simulations. In other words, a sensitivity analysis is performed

instead of the earlier-defined 'uncertainty' analysis. Unfortunately, the wrong use of the term 'uncertainty' leads to wrong conclusions. Four different friction parameterisation models have different numbers of parameters (from one to three). According to the authors, the model with three parameters shows smaller uncertainty than the model with only one parameter. This could be true only when the term 'uncertainty' is replaced by 'variability'. It simply shows that some parameters in that particular parameterisation scheme have a small influence on model output. Unfortunately, it does not mean that the model output has a small uncertainty (i.e. is better defined). In some way, the authors do the opposite to what Gupta and Razavi (2018) described as a sensitivity analysis using the goodness of fit criterion instead of output variables. The latter and the present papers show that a clear formulation of the problem helps to avoid drawing wrong conclusions.

In summary, the authors are asked to correct their problem formulation and apply a sensitivity method (e.g. the Global Sensitivity Analysis GSA of Saltelli et al., 2004). Berends et al. (2018) could also be helpful in dealing with the high computer time costs of hydraulic models. My specific comment regards the calibration method which is not explained.

References

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