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Interactive comment

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

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Dear Prof. Renata Romanowicz,

thank you very much for your valuable comments to our article. We read them carefully and addressed them in the following text. An updated version of the manuscript including your suggestions is currently being prepared and will be soon available.

The use of the terms "uncertainty" vs. "sensitivity" analysis seems to be a constant discussion in the scientific community and it obviously leads to misunderstandings. For example in the references you mentioned: Saltelli et al. (2004) wrote (Box 1.1) "This is in fact an uncertainty analysis, e.g. a characterisation of the output distribution of Y given the uncertainties in its input."; Berends et al. (2018) used the Monte Carlo

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method and referred to the results as “uncertainty estimation /quantification”; Saltelli et al. (2008) in Section 1.1.4 described exactly what we presented in our analysis with the Monte Carlo method as "uncertainty analysis“. Further examples of the use of the term "uncertainty analysis“ can be seen in Hofer (1999), Maskey and Guinot (2003) and Altarejos- García et al. (2012), where the term was employed similarly to the way we did. Furthermore, Walters and Huyse (2002) described in Section 2 (“Review of Uncertainty Analysis Methods”) amongst others the same three methods we used.

I understand the need for a common language and agreement in using identical names when addressing identical things. Therefore, my suggestion would be to exchange the term “uncertainty analysis” with “uncertainty quantification” in our manuscript. This would be in agreement with Berends et al. (2018) and with other studies carried out similarly to ours, e.g. Hosder and Walters (2010), Oladyshkin and Nowak (2012), and Sudret (2015).

Our goal of investigation is to quantify the uncertainties of hydrodynamic model results on floodplains with regard to different friction methods. Within the large number of different friction methods there is still no generally accepted method for large scale applications. The outcomes of the uncertainty quantification will help to choose a better suited friction method for practical use. The model was previously calibrated based on the best information available and the input parameters are perturbed within a practical range of variation, and not across the whole feasible parameter space. Analyses considering the entire parameter space are still computationally unfeasible in real engineering projects involving large models and cannot be put in practice in our case.

With respect to the problem formulation we will improve the description in Sections 1 and 3 accordingly. Furthermore, from the sensitivity methods presented in Saltelli et al. (2004), we will add scatterplots and calculate the standardised regression coefficient (SRC) to assist the evaluation of each friction formulation (see figures). With respect to the calibration method, we will emphasize in Section 4.1 the fact that previous investigations already presented good results for the hydrodynamics. This knowledge was

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the starting point for our study.

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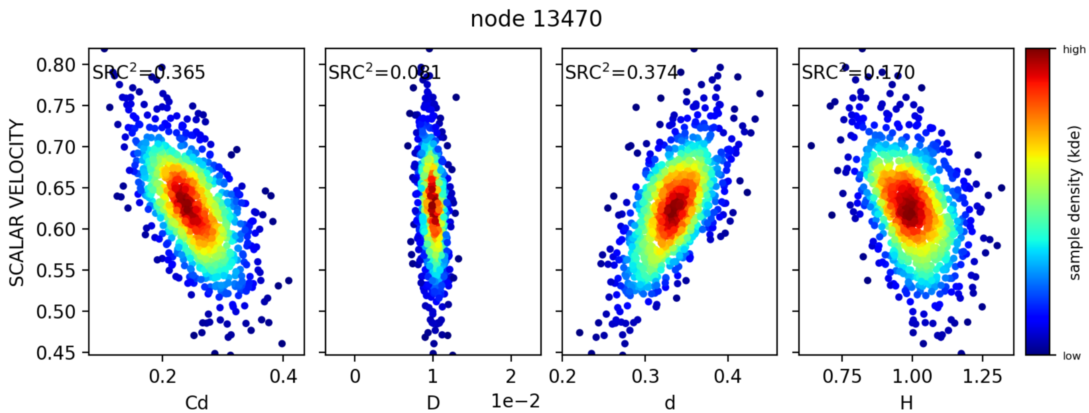

Fig. 1. Scatterplot of scalar velocity for BAPT friction formulation.

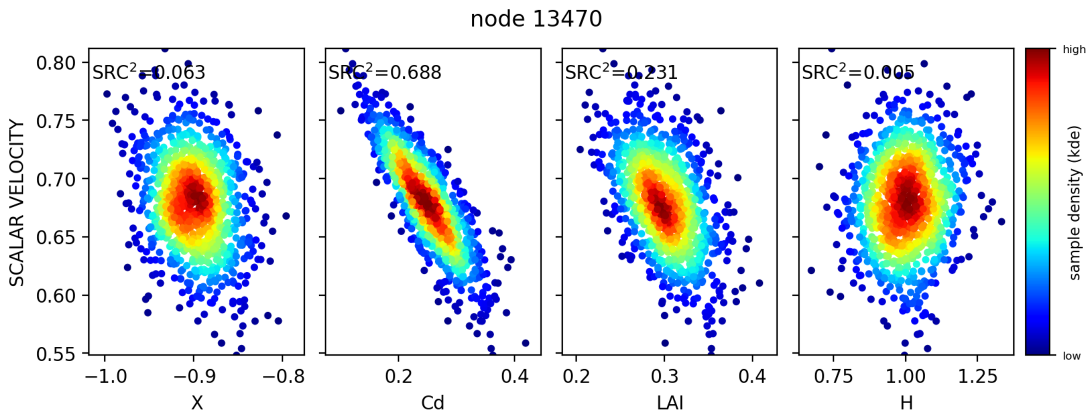

Fig. 2. Scatterplot of scalar velocity for JAER friction formulation.

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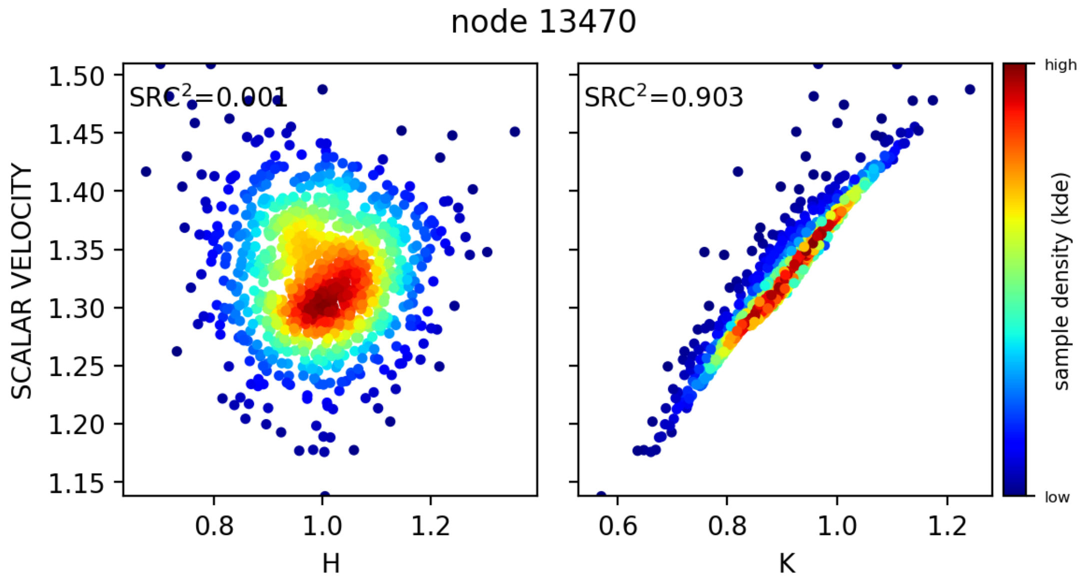

Fig. 3. Scatterplot of scalar velocity for BATT friction formulation.

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