gmd-2020-350: responses to reviewer comments

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We thank the anonymous reviewers and the editor for carefully reading the manuscript and for providing valuable comments. We address the comments one by one below. The reviewer comments are pasted verbatim below in italics, and the author responses to these comments can be found immediately under the comments, starting "A:". These are followed by "**Changes to manuscript:**" sections. All three edits are highlighted with boldface in the text of the article, all in Section 2 there.

Anonymous Referee #1

The authors have addressed most of my earlier suggestions and I find the paper reads better as a result. I have a few more minor suggestions:

(1) While I understand that a more concrete summary of algorithmic steps in the LA-MCMC algorithm may be too far afield for this paper, I wouldn't assume that all readers are familiar with Matlab or will have access to Matlab licenses. Some specific words like "we implement Algorithm 1 from Davis et al 2020, with the following parameter values as defined in that paper", would help the readers to know exactly where to go in that paper to see what is being done.

A1: **Changes to manuscript:** The respective sentence has been edited, and the reference to Davis et al 2020 has been added.

(2) If the authors used ridge regression in their implementation of Davis et al 2020, I assume there is a hyperparameter associated with the strength of the L2 penalty on polynomial coefficients. I don't see such a hyperparameter mentioned in the text, nor comments about how they would have set its value – though it could be done through cross-validation which is already performed on the local regression results as the algorithm runs. Anyway, it would be good to see some brief mention of this, especially since it is a variation on Davis et al 2020.

A2: In numerical experiments it turned out that the results of the ridge regression were rather insensitive with respect to the spesific value of the regularization/hyperparameter α used, as long as it was roughly in the range (0.1,10) (similarly as is shown, e.g., in the demo of the Matlab's ridge function help). The choice $\alpha = 1$ was then selected to be used.

Changes to manuscript: The regression has been explained with a bit more details in the text, and the hyperparameter value is given.

(3) The mention of previous classic emulator papers should actually include citations to those papers in the bibliography! The references are Sacks, J., W. J. Welch, T. J. Mitchell, and H. P. Wynn (1989). Design and analysis of computer experiments. Statistical Science 4(4), 409–423. Kennedy, M. and A. O'Hagan (2001). Bayesian calibration of computer models. Journal of the Royal Statistical Society: Series B (Statistical Methodology) 63(3), 425–464.

A3:

Changes to manuscript: The references have been added.