

Geosci. Model Dev. Discuss., author comment AC2
<https://doi.org/10.5194/gmd-2022-121-AC2>, 2022
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Reply on RC2

Arthur Nicolaus Fendrich et al.

Author comment on "Matrix representation of lateral soil movements: scaling and calibrating CE-DYNAM (v2) at a continental level" by Arthur Nicolaus Fendrich et al., Geosci. Model Dev. Discuss., <https://doi.org/10.5194/gmd-2022-121-AC2>, 2022

Dear Dr. Metzler,

We would like to thank you for the very relevant comments about our work. We answer below the comments, and we will fix all the issues in the next round of manuscript revision.

Reviewer: "In this regard I like also the explanation of the matrix shape in Section 3.3. Nevertheless, I wished I could have "seen" a matrix, at least as a schematic block matrix after the authors speaking so much about matrices."

Answer: We agree that it would be interesting to visualize the matrix structure. We will add this image and information in the next manuscript version.

Reviewer: "Sometimes though the text appears too lengthy in my opinion. This starts with the abstract and continues with quite some overlap in the sections about calibration, results, simulations and limitations. Furthermore, in particular in later sections I was overwhelmed by an extensive use of potentially unnecessary numbers."

Answer: It was a common point in both Reviewer's comments that some text sections are lengthy. In order to fix this problem and improve readability, we will rewrite several passages in the next version of the manuscript, with extra attention to the aforementioned unnecessary numbers.

Reviewer: "I furthermore do have some issues about an easy reproducibility of the method, because to me it seems that in Section 2 some formulas are incorrect and notation is not precise. Well, either the formulas are incorrect or I understood them wrong, neither option is preferable (...) Under this point of view formulas and notation should show no flaws. (...) This starts with Table 1, which is in general very nice, but it is incomplete (...). So would like to encourage the authors to carefully check the notation and the formulas again, along with their implementation."

Answer: We thank very much the Reviewer for pointing out all the problems with the notation adopted. We strongly agree that this is critical for adopting and disseminating the matrix approach and for future developments of the method. In order to fix all issues, all the formulas of the manuscript will be carefully reviewed and rewritten to prioritize precision, conciseness, and clarity. We hope the new notation will be precise and resolve any confusion that may have arisen.

...

Reviewer: "This allows the application of sparse matrix models as well as an improved application of parallel computation methods. Another advantage of matrix models is that they allow a rigorous mathematical analysis something the authors did not do in this manuscript (it was not their goal) but can be done in the future based on the matrix reformulation."

Answer: We truly appreciate this suggestion and agree that it would be an interesting work to develop in the future.