

A summary of all modifications to the final revised version is provided hereafter. Thank you for taking the time to review our revised manuscript.

General comments of Reviewer 1 (R1) & R2

R1 requests availability of code and data in a form suitable for GMD.

- The code is now available in a suitable format, including all scripts to run the presented simulations. However, the Zenodo links need to be added to the "Coda availability" section.

- However, there is no model output data provided. I'm not sure whether this is a requirement; even if it is not required, model run data would be useful to have. Most useful would probably be the data format used in the SHMIP exercise.

A new version of SUHMO has been tagged and referenced in the manuscript. This new version includes the following additional input files/scripts/results:

- inputs and scripts to run the distributed test cases of Sect. 4
- convergence analysis results for both distributed and channelized test cases presented in Sect. 4
- results for all one-dimensional plots presented in Sect. 5

Note that each test case is structured as follows: a main folder (say, SHMIP_A for the A suite) contains subfolders for each specific run (say, A1 to A6) where input files are provided for the main run and (when applicable) to launch a series of post-processing. Alongside these run subfolders, a (or a series of) python script(s) is (are) present to semi-automatically launch all of the runs and their analysis, and produce all data reported in the manuscript.

For convenience and easy testing of reproducibility, all of the 1D results presented in the paper are provided in plain text (.dat, to be as general as possible). These data files are located in "results" subfolders under the appropriate run subfolders (for SHMIP) or in a CONV_ANA subfolder at the root of the main folder (for results of Sect. 4).

Including the entirety of the 2D results presented in the paper ("plotfiles") would take too much storage space, especially for the 2D fields of Sect. 6. The aforementioned python scripts will produce these 2D results, however (for all runs of Sect 4, 5 and 6 along with the modified tests of suite E as presented in the Supl. Mat.). These plotfiles will be in HDF5 format. These HDF files can be visualized with several open source software -e.g., ParaView. This has all been precised in the "Code Availability" Section.

R2 was wondering about tuning SUHMO to the GlaDS results in SHMIP:

- it's fine to not do that but:

- state clearly that SHMIP runs are mostly done for a 1-1 comparison to SHAKTI and not so much to for a comparison to other models. Add this to the first paragraph of Section 5.

This has been addressed in Sect. 5.

Specific comments of R1

Re-Remark to R1, Table 1, value of A: the SHMIP paper recommends to use $A=3.35e-24 \text{ Pa}^3\text{s}^{-1}$ (which is reasonable for temperate ice), however that is for a closure formulation of form $2A/n^n S N^n$. Here a form $A' S N^n$ is used and thus the used $A'=2.5e-25$ corresponds to the recommended $A=3.35e-24 \text{ Pa}^3\text{s}^{-1}$.

This has been specified in the legend of Table 1.

Specific comments of R2

Hewitt 2011 needs to be cited <https://doi.org/10.3189/002214311796405951>. This is the base for this model and thus the original warrants a citation even though the specifics are found in SHAKTI. Probably best in the first paragraph of Section 2.

This has been rectified.