

The manuscript *Scientific Workflows Applied to the Coupling of a Continuum (Elmer v8.3) and a Discrete Element (HiDEM v1.0) Ice Dynamic Model* has substantially benefited from the last revision. The paper now is much more reader-friendly than before.

I still am not fully convinced by the idea of first listing the steps in the workflow, then stating requirements for the rewrite, then describing the realization of the workflow, and then showing how the new workflow fulfills the requirements. I largely regard this as a stylistic decision, that is left to the authors, but during reading I am left with the impression, that I'm repeatedly reading similar passages. One such case is the overlap between sections 3.3 and 4.3.2. I would suggest to revisit the two sections and perform some streamlining (maybe use exactly the same structure in both, so referencing 3.3 in 4.3.2 is easier?).

Sec 6 Related work is unexpected in this location. The information looks like it could be part of the overview of the state-of-the-art in the introduction. Also, please re-consider which parts of this section are relevant to the reader.

Physics and setups:

Section 3.3 could use a few more references to Vallot et al. (2017,2018) regarding the setups. The prescribed temperature field could be briefly explained.

In section 3.3 step 3, it is stated that "HiDEM scales down the obtained friction parameters it receives from Elmer/Ice (in our case using the factor  $10^{-4}$ ) so as to increase the sliding speeds and thereby reduce the physical time (in our case 100 s) needed to evaluate the resulting fractures."

At this point more information on how the stress field is preserved in this scaling and which parameters are affected by the scaling would be very helpful, especially to other scientists planning similar couplings. Is viscosity scaled as well? Any other constants or fields? Is this a feature of HiDEM, or is this done in the transfer scripts? Can you provide evidence of the successful rescaling of the equations?

Also, the reasoning for the separation of time scales permitting the rescaling needs to be more precise than "are separate anyhow" (p7 130), especially considering the rescaling by a factor of  $10^4$  (turning a second into a few hours).

A reference to the prescribed temperature field, that removes the effects of strain heating and basal frictional heating (which would grow drastically with upscaled velocities) might also be helpful.

Specific comments:

page 3 line 5: Gagliardini et al. (2013) needs an *e.g.*. This is just one (rather new) ice dynamics model.

Page 3 line 20: *fraction* should probably be *fracturing*.

Page 3 line 28: *very complex* – that's subjective. *complex* should do. Similarly *two (or even more)*.

Page 7 line 4: *basal friction law of any type* sounds strange. Maybe just say *a Weertman friction law*

Page 7 line 9: Cuffey and Peterson needs an *e.g.*

Page 7 lines 19, 21 ~~required~~, also lines 21-23 ~~Without input ... is a necessary prerequisite for all further iterations.~~ There is no need to justify that the input data and directories need to be provided before the models can be started.

Page 8 line 21: ~~in a batch system agnostic manner.~~ The agnostic part is probably requirement 11.

Page 9 line 13/14: Please rephrase.

Page 9 line 24 ~~against any errors~~ show me an error-free piece of code...

Page 16 lines 9 ... We can consider it standard good practice to bail out of a job when one of the components has failed. That's not a very innovative thing relying on UNICORE, but standard housekeeping.

Page 19 Section 5.4 Lines 5/6 and 9/10 seem to be duplicates. Consider rephrasing the subsection to clarify.

Page 19 lines 19...

"one could argue ... workflow." maybe just say that this is facilitated by UNICORE, instead of lamenting about the difficulty of writing a job header.

Page 19 line 33 ~~"and in a batch system agnostic manner"~~

Page 22, line 9: consider replacing "fire-and-forget pattern" with something that's not missile-terminology.

Figures:

On the way from Vallot 2018 (there Fig. 3) to Memon et al., Fig. 1 gained crevasses in the sketch, but lost "+1" in the bottom index in the right part of the Figure.

Fig 5 still is the right half of Fig 4, and shares a lot of information with Fig. 2. Please change this or make the intentions of this duplication clear in the captions.