

Interactive comment on “Scientific Workflows Applied to the Coupling of a Continuum (Elmer v8.3) and a Discrete Element (HiDEM v1.0) Ice Dynamic Model” by Shahbaz Memon et al.

Anonymous Referee #2

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General comments

This manuscript describes a new workflow implementations based on the state-of-the-art UNICORE middleware suite to automate and simplify complex task structure across distributed and heterogeneous computing environments. The authors take as a case study an example of coupling two numerical models, one for continuum dynamics of a glacier (Elmer Ice) and a discrete model for calving processes (HiDEM), to demonstrate the progress made by this new implementation. This is an interesting paper that describes a new coupling method that will make the lives of scientists that want to couple different models, even on different platforms, much easier, if the implementation is

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as simple as described. The progress in process understanding in many areas, including Earth Sciences, climate research and glaciology, calls for coupling of models, for example climate models with dynamic ice sheet models, ocean circulation models with ice shelves and many others in addition to the example taken in this paper. There will be increasing numbers of coupling tasks in the future and this method opens a way forward in making this kind of task more straight forward and less error prone.

The paper is well written and clear, even though it is somewhat long, the problem is well described, the issues with the initial workflow and the requirement analysis is useful for assessing how well the new method improves the workflow. Authors manage to convince that the new workflow is a great improvement to the previous bash-shell script and will make adaptation of new processes relatively easy. They state that this workflow implementation can be exported for re-running simulations on different platforms, it can be re-used to adapt and apply to new datasets and easily extended. I have only a few minor comments to details in the text, see below.

Specific comments

Title: suggest to put "model" in plural

Page 4, line 1, suggest to find an easier name for "the glacier coupling and calving use case" – and in other places use this name, it will make reading easier

Page 4, line 2, add "a" in front of "part"

Page 4, line 14, suggest to replace "largely" with "extensively"

Page 4 line 24, suggest to edit "the later-on extruded footprint" is not clear

Page 4, line 30 suggest to replace "long-time" with "long-term"

Page 5, line 11, missing r in through

Page 12, line 32, can you state how much "significantly reduced" is?

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Page 16, line 17, missing t in "It also..."

Page 18, line 28, missing year in reference

Page 19, line 5, is a repeat, it has already been stated, maybe it is possible to combine these sentences?

Page 23, line 29, suggest to replace "huge" with a quantitative statement

Page 25, line 1, suggest to replace "verify" with "validate" and "glaciology" with "glaciological"

Interactive comment on Geosci. Model Dev. Discuss., <https://doi.org/10.5194/gmd-2018-158>, 2018.