

General comments

This manuscript describes a JavaScript version of the Ice Sheet System Model that enables users to interact with the model via a web browser. My understanding is that users are able to set up simulations via the web interface and either run them directly on the web server or indirectly via through a job that is automatically submitted to a cluster or supercomputer. In either case, the results are displayed interactively using the browser's 3D graphics capabilities. The concept is that this approach will make ISSM more accessible to non-experts without compromising capabilities or requiring separate development of the core ISSM capabilities for this purpose.

The paper is well written and only some fairly minor revisions are required to make it ready for publication, as outlined in my specific comments below.

The other 2 reviewers expresses a certain amount of confusion about what the intended audience for the JavaScript representation might be. While I felt that was fairly clear to me, I can appreciate that further explanation would be useful. The translation of so much of ISSM to JavaScript must have been quite a tour de force, something that other ice sheet models are unlikely to undertake unless it is very clear what the benefits of developing (and maintaining) a JavaScript version of their models will be.

I was very impressed with the online examples on the VESL. While I share Reviewer 2's view that users are currently restricted to an extent that the example results could have been pre-run and cached, I appreciate the potential versatility that could be built into this system, quickly making pre-caching results completely impractical. I'm pleasantly surprised with the quick turnaround from setup to viz that this system allows (presumably because the examples are relatively light weight, but even so). I look forward to seeing how the VESL develops.

Specific comments

l. 62: It is probably a question of reference frame, but do you perhaps mean "downloading" instead of "uploading"? My picture was of the server automatically downloading the data it needs to run the simulation, whereas uploading seems like something the user has to do manually. Perhaps I'm just unclear on what exactly is being moved to the server and from where.

l. 119-120: "The basis for representing a model in ISSM is a series of classes (mesh, mask, geometry, settings, toolkits, etc.) that are carried into a global model class." I'm unclear as to what exactly is meant by a "model" at the beginning of this sentence and by "carried into" in the second part. Please explain these two concepts in a bit more detail. My sense is that what you refer to as a "model" here is what I am more familiar with as a model setup or a test case or something like that. My guess is that "carried into" might mean that the global class contains instances of each of the other classes, but I really am not clear on what is meant.

Supplement:

I tried to compile ISSM with JavaScript under Ubuntu 16.4 but was not successful. I realize the supplement states that only MacOSX is currently supported, but I decided to give it a try. When I run the configure command as given in the supplement, the command hangs after printing the line:

```
checking whether the em++ linker (/usr/bin/ld -m elf_x86_64) supports shared libraries... yes
```

I wasn't able to figure out what command is being executed that causes the hang.

Anyway, that is to say that I think probably more support will be needed to get the JavaScript version of ISSM up and running on more platforms.

Typographic corrections

l. 4-5: Here and elsewhere in the manuscript, I think "pre and post-processing" should be "pre- and post-processing" with two hyphens.

l. 5: I think "i.e." should probably be "e.g." since other tools such as IDL are also sometimes used for this purpose, as pointed out later in the manuscript.

l. 5-6: "non specialists" should be "non-specialists"

- l. 139: “In addition to the classes representation in JavaScript...” I think “classes” should just be “class”.
- l. 189 and 191: “respective to” should probably be “depending on”
- l. 230: “all without loss of the physical representation of processes nor scalability” here, “nor” should be “or”.
- l. 237: “The first simulations pertain to the simulation of glacier flow...” Presumably “simulations” could be changed to “setups” or similar to avoid redundant use of the word “simulation”?

Fig. 1: I would suggest changing this figure to be a listing instead. If you prefer to keep it as a figure, I would suggest changing the color scheme to be dark text on a light background to make it more print-friendly and easier on the eyes (especially at this rather small font size).

- l. 331: There seems to be a stray semicolon here, right before before Listing 2.

Supplement:

- l. 7-8: “...JavaScript support turned on lies in the specific configuration...” You probably want to keep only one or the other of “turned on” or “lies in”.