

Interactive comment on “Shingle 2.0: generalising self-consistent and automated domain discretisation for multi-scale geophysical models” by Adam Candy and Julie Pietrzak

Anonymous Referee #1

Received and published: 23 June 2017

This manuscript presents the general structure and design of the Shingle 2.0 library. The goals of the library are to allow the full description of domain discretizations in a reproducible and shareable manner. From this perspective meshes are an integral part of the overall model description. This contrasts with the somewhat ad-hoc manner in which meshing is often treated in today’s literature. Shingle 2.0 uses the Spud library, which allows common model features to be exposed to users through a hierarchical options interface, diamond, that is easily extensible when new features are required.

The general idea of this library is excellent. Meshes and domain discretizations should be treated much better than they often currently are and allowing users to share and

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build on other authors' work in a reproducible manner will certainly be helpful. I am however concerned that while this paper does a reasonable job of the difficult task of presenting the library, much of the theory (and the original version of the Shingle library) appears to be in a paper (Candy, A.S., 2016. A consistent approach to unstructured mesh generation for geophysical models.) that is still under review. This manuscript relies heavily on this paper, frequently citing and referencing it, and the authors have made it available online, which is useful, but it would seem odd if this manuscript was published first.

Beyond this manuscript the library appears to be well documented and I was able to install it however the claim is made (e.g. line 541) that deviations in the mesh are only expected to depend on the version of the shingle library. This seems like quite a bold claim, given that the library has a number of dependencies. These dependencies should be discussed in the manuscript - some are mentioned throughout but some more discussion or a table would be useful (a full list is provided in the manual).

A number of example snapshots are given but these are mostly taken from the aforementioned paper, Candy 2016. I think it would be very useful if a full worked example was included in this manuscript. This would demonstrate the workflow and could be used to direct potential users to more complete examples in the manual.

A worked example may also help to illuminate Figure 2, which is referenced a lot but did not help me to understand the manuscript very much. It's quite a confusing list set of arrows and labels, with no clear workflow presented. I realize there may be multiple possible workflows depending on how the user interacts with the library but these could be described much better in worked examples.

Some more minor technical issues:

- line 32: missing "is": "... - is likely to grow."
- line 49: first reference to table 1 (page 3) but then table 1 doesn't appear until page

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9. Please move up.

- line 100: the sentence beginning "Its modular library framework, ..." is very long and unwieldy. Please break up.

- line 133: typo? "Lower-lever" -> "Lower-level"?

- line 148: Another unwieldy sentence. Consider changes marked by *: "The LibShingle library*,* central to the generalised approach (illustrated in figure 2)*,* is detailed in section 5 *and* ways to *interact* with the framework *are* presented in section 6. Examples and validation *are* covered in section 7,..."

- line 162: outcome*s*

- after equations 7 and 8: "identification elements" are not defined

- figure 4: make bigger (text width?) and higher resolution?

- line 313: "This information can *be* presented..."

- line 537: "... if possible, *is* better handled automatically..."

- line 673: "... in *the* COPYING *file*..."

Interactive comment on Geosci. Model Dev. Discuss., <https://doi.org/10.5194/gmd-2017-47>, 2017.

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