Geoscientific
Model Development
Discussions

Interactive comment on "pynoddy 1.0: an experimental platform for automated 3-D kinematic and potential field modelling" *by* J. F. Wellmann et al.

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Thank you for the encouraging and very helpful comments! We are specifically happy to see that our aim to make uncertainty studies with kinematic models more accessible is well reflected in the reviewer comment!

Please find below a detailed list of reviewer comments and our responses. Changes are incorporated into a revised version of the manuscript.

(1) Comment from Referees: Section 2.2 (Kinematic structural modelling with Noddy) might be reduced. In particular the Eulerian/Lagrangian part is hard to follow to me.

Probably a list of features of Noddy provide enough information, without the description of "how a fault is represented" or "how rotations are implemented".

(2) Author's response: The consideration of the amount of material is a difficult decision—see also that the first reviewer requested more information on specific features! We decided to keep the information, as it provides important background information to the reader so that the capabilities (and limitations!) of Noddy can be better understood.

(3) Author's changes in manuscript: -

(1) Comment from Referees: Section 2.3.1 Only Magnetic fields are mentioned here. Although, in the examples, gravity fields are computed and shown. A list of the available fields that can be synthesised from the models would be helpful.

(2) Author's response: Thank you for pointing this out. We added an introduction sentence explaining this point.

(3) Author's changes in manuscript: Introduction sentence added.

(1) Comment from Referees: Three numerical schemes are described to compute observables (spatial convolution, spectral and full spatial). From Section 3.2, one could infer that gravity is always computed with the later scheme. Is that right? Are the different schemes used to compute different fields?

(2) Author's response: It is possible to compute gravity with any of the described schemes, and we actually describe this in lines 173-175. We included a note stating specifically that these schemes are applicable to both, gravity and magnetic fields.

(3) Author's changes in manuscript: Adjusted text in lines 173-175.

(1) Comment from Referees: Could pyNoddy be used to perform inversion studies? For example, which is the timing of the activation of some fault that produces a gravity field matching better with observations? Maybe something in this line could be added

in the discussion section, showing the potentialities of the framework.

(2) Author's response: Absolutely—this is actually one of our current paths of investigation.

(3) Author's changes in manuscript: We extended the paragraph on "Future extensions" with a note on this interesting possibility.

(1) Comment from Referees: Also for the discussion: do you think is would be possible to develop an abstract framework that could be used not only with Noddy, but with any (or a wide range) of simulation tools? Maybe, just extending a "modeling Program" class one could get an simple way of generate in a systematic way a serie of model results and automatically deal with the produced outputs.

(2) Author's response: This is also a very good idea, and we expect that this is in fact possible in the future! We hope to provide a step in this direction with the work presented here, as it should enable an integration into a more abstract modelling scheme.

(3) Author's changes in manuscript: -

(1) Comment from Referees: I found the paper more easy to follow than the User Manual (UM). For example, - the installation section of the UM is harder to follow than the Annex. - Some dependencies stated in the realm file are not in the UM. - Some typos are present (e.g. missing slash on page 4: "(Sec. [sec:inst-textsfpyn-from]). - for a completely new user the section "1.11 What is Noddy?" should be at the very beginning. - There is some noise on the OS that are required to run Noddy/pyNoddy. On Page 7: "The software runs on Windows only, but the source files (written in C) are avail- able for download to generate a command line version of the modelling step alone: https://github.com/flohorovicic/pynoddy It has been tested and compiled on MacOSX, Windows and Linux." It was not clear to me not whether Noddy run in windows only or in any platform until later in the manual. - The "modelling step" is any of the

four steps stated before at same page? - issue with bolds between page 9 and 10 - Because (I assume) most users won't have Noddy already installed, I suggest starting the installation procedure with the instructions to install Noddy.

(2) Author's response: Thank you for pointing this out! We addressed these issues and updated the documentation. Please note also that the documentation is an active document and constructed on the basis of the repository readme file, code docstrings and ipython notebooks (this is the reason for potential typos), and mistakes can directly be raised as "issues" in the github repository to ensure future corrections.

(3) Author's changes in manuscript: Adjusted documentation (both print and online).