

Geosci. Model Dev. Discuss., referee comment RC3
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Comment on gmd-2021-22

Anonymous Referee #3

Referee comment on "fv3gfs-wrapper: a Python wrapper of the FV3GFS atmospheric model" by Jeremy McGibbon et al., Geosci. Model Dev. Discuss.,
<https://doi.org/10.5194/gmd-2021-22-RC3>, 2021

This work introduces a Python wrapper for the FV3GFS model. The paper is well written and clearly explains the need for the wrapper and the approach used in its implementation. It's great that the authors also provide a use example in a Jupyter notebook. I think that the presented work is interesting and useful to the GMD community. In my review I tried installing and running the software and I read some parts of the documentation. As a result some of my comments are related to the docs and not just to the GMD manuscript. I hope those comments are helpful, but I understand that the docs are not part of the GMD review.

- The introduced wrapper facilitates machine learning applications. In that context, I was wondering how easy it is to change the FV3GFS model parameters? By model parameters I don't mean for example the model time-setp but rather some of the free parameters that are used by individual parameterizations inside the physics step of the model. Does that require recompilation of the FV3GFS code and interaction with the Fortran code?
- On a similar note, is there a way to query from Python the namelist files used by the Fortran model? This way the Python level user would still have easy access to the parameter values that are in use in the FV3GFS model. Maybe an example like that would be useful?
- The docs mention that the data container used by the wrapper supports the information about the units. The manuscript text only mentions units when describing the Jinja templates and JSON files. I think this is a nice feature and it's worth mentioning in the main manuscript text as well. Would it be possible to design tests that check the units of variables used in parameterizations of FV3GFS model by using the wrapper and some Python units package?
- It's probably clear to the users of FV3GFS, but it wasn't clear to me from the docs or the manuscript - what variables go into the `get_state` and `set_state` functions? Maybe example in the manuscript or the docs with some minimal dictionary would be useful? On a similar note, could you provide, in the docs or the manuscript, some more information about the Quantity object that is used as the data container?
- In the online docs in the Readme section (<https://vulcanclimatemodeling.github.io/fv3gfs-wrapper/readme.html>) the

[short_name](long_link) was not rendering properly for me. Instead I was seeing the whole [short_name](long_link) string.

- Figure 1 and 2 in the paper: I think that the fonts on the plot should be larger to make reading more comfortable. Also, the black font on the dark blue background was hard to read for me.
- On some HPC clusters Docker is not allowed and instead the users are asked to use Singularity. I was able to use the Docker image as a Singularity image and import the wrapper correctly in Python3 on our cluster (using Singularity 3.5.2). I didn't check further because of the need to provide google credentials for download. For the ease of use on other clusters I would suggest double checking if the Docker image can be used as a Singularity image for the wrapper without any problems. I would also suggest considering storing the necessary data in a way that does not require google credentials for download.