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Interactive comment on “The infrastructure MESSy submodels GRID (v1.0) and IMPORT (v1.0)” by A. Kerkweg and P. Jöckel

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We thank the referee #1 for his/her helpful comments. A pointwise reply is given below:

This paper describes a new component of the MESSy model that aims at improving the reading and preprocessing of gridded data by ensuring a single entry point and offering common grid processing functionality. This topic is very relevant to the users of MESSy and could also be of interest to others models dealing with gridded data. Unfortunately, the paper suffers from several major flaws. First, it requires English editing and specially for the first half that is sometimes a little hard to understand (for example the introduction on page 8609).

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Fortunately, GMD articles are copy-edited upon final publication. Nevertheless, we will check again the manuscript w.r.t. the language before submitting a revised version.

Some of the vocabulary is a little surprising (on page 8610, line 18, what is an “abstract time series”?) .

The “abstract” refers to “data”, not to time series. In order to avoid this misunderstanding and because data is always abstract, we remove the “abstract” in the revised manuscript.

The paper also relies heavily on concepts, vocabulary as well as acronyms of the MESSy community making it quite obscure outside this community (see for example page 8623) or the lack of even a brief definition of what MESSy is). Quite a few of these acronyms are defined in the text, but not all and generally after being introduced.

We will wade through the text and make sure that really all acronyms are introduced the first time they are mentioned. Moreover, we will add a short review on what is special about the concepts of MESSy and we will make clear that the names of the MESSy submodels are written in capital letters even though they are no acronyms.

Overall, the paper lacks clarity.

A more precise statement would help to improve it. Nevertheless, we will try to identify potentially unclear passages and improve the text accordingly.

The paper also lacks structure: some details are given in what should be the general introduction to a new section while important concepts of the general infrastructure are not provided until several paragraphs after being first used (for example the NREGRID and SCRIP third party modules are mentioned

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multiple times on pages 8609, 8610, 8611 and finally briefly defined on page 8612 but without enough details to show what are the key differences between the two).

The most important differences are already listed in the introduction on page 8610. SCRIP provides “transformations to/from curvi-linear or unstructured grids.” We will rewrite the sentence to clarify that NREGRID can not handle curvi-linear and unstructured grids and make sure that additional information is introduced as early as possible.

Some sections should be merged together (the introduction to section 3 is mostly a rephrase of things written previously,

The introduction is not that long and we wanted to emphasise the point, that IMPORT constitutes one single point of data input, while CHANNEL one single point of data output. Nevertheless, we will try to shorten the introduction.

the whole section 4 should be condensed in a few sentences and merged into the introduction).

Here we disagree with the referee. It was one important intention of the article to also document the history of data import in MESSy. As will become clear when reading Section 4 the emission and deposition submodels have been published under certain names (ONLEM, OFFLEM and DRYDEP, respectively) still performing individually the data import. In more recent MESSy articles using the new emission and deposition models (ONEMIS, OFFEMIS and DDEP) with the “out-sourced” data import, we had to argue why these submodels are basically still the same as the ones published, but are named differently. In future it would be nice to have a citable publication for this submodel renaming.

On the other hand, some details are missing: for example the programming language that has been used is not even mentioned.

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As MESSy always employs the programming language Fortran90/95 we forgot to mention it explicitly in the article. We will add this information. It would be good to know, what the other missing details are. We did not omit them by intention. Yet, we will re-check.

The vocabulary is also not very consistent with different names for the same ideas in different sections (“grid routines” vs. “mapping routines” vs. “mapping algorithms” for example) and not defined when this would be needed (what does this mapping means? Is it not a reprojection of the grid? This is not very clear outside this community.)

The phrase “grid routines” does not occur in the article. The only phrase that is near to it, is “grid handling routines”. Actually, we thought it would be understandable, that these are the routines required to work with or on the grid structures, e.g. comparison of defined grids etc. . It will be clarified in the revised manuscript. The words “regridding”, “remapping”, “grid transformation” and “mapping” are indeed used as synonyms (we will state so in the revised manuscript), as we see for this application no big difference between them and tried to avoid tedious repetition of the same word over and over again. “Mapping”, as a contrast to “interpolation” calculates the overlap between individual grid cells and calculates the data field on the target grid by summing up the individual contributions of the source grid cells overlapping with a target grid cell weighted with the overlapping area of the single grid cells. This will also be clarified.

Finally, this paper fails to demonstrate the originality of the work. The results that are presented have actually been produced by third party modules and it seems that the work presented here mostly consists of a wrapper around these modules that fully perform the heavy duty processing.

This is true with respect to the mapping routines, which, in their core use SCRIP and NREGRID as detailed in the article. Nevertheless, the definition and handling of grids

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is completely new and thus the work is original. We will clarify this.

Moreover, these third party modules were already used in the past by MESSy (although it is now done in a cleaner way). if this is not the case, the authors should clearly explain it and show actual scientific content and results of their own work.

GMD is not about scientific content. It is for documenting technical model developments. Yes, IMPORT and GRID are wrappers for third party (or second party; actually NCREGRID was written by the second author of this article) code. But here, we document an important step in the development of the MESSy infrastructure. This article is part of the special issue on MESSy and GMD invites also papers documenting new development steps or updates of model parts. Thus we think this article fits very well within the scope of GMD and we do not have the show scientific results here.

Therefore, although some explanations about how to use this new module are given (that are obviously only relevant to the users of this new submodel), the paper does not bring any usable information or new knowledge to the scientific community.

As stated above, GMD does not only publish papers containing new scientific knowledge, but also documentations of the tools on which scientific knowledge is and will be based. Additionally, we object to the statement, that this is not relevant for non-MESSy-Users. The stand-alone model, which is part of the supplement and briefly described in the article can be used by everybody, independent of the other parts of the MESSy framework. Indeed, it can also be coupled to other models as well. In the past, the previously used NCREGRID stand-alone model was used outside the MESSy community. We will clarify this in the revised manuscript.

The authors also fail to present their work in a way that would be less dependent

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on MESSy, therefore restricting the applicability of their work. This is exemplified by the figures 1 and 4 that mostly show how MESSy has been restructured instead of showing how the generic pre-processing of gridded data has been improved by their approach. Outside the MESSy community, these figures are not very helpful.

As GMD welcomes model code documentation and these information are helpful for the users of MESSy, we do not see why we should remove information relevant for model users from the model documentation. Nevertheless, we will strengthen the information, that IMPORT and GRID can also be used (and how) by other users in the revised manuscript (as stated above).

Interactive comment on Geosci. Model Dev. Discuss., 8, 8607, 2015.

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