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Atmospheric Chemistry and Physics Discussions



# *Interactive comment on* "Technical Note: Implementation of prescribed (OFFLEM), calculated (ONLEM), and pseudo-emissions (TNUDGE) of chemical species in the Modular Earth Submodel System (MESSy)" *by* A. Kerkweg et al.

**Anonymous Referee #4**

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Kerkweg et al. present submodules OFFLEM, ONLEM, and TNUDGE of the Modular Earth Submodel System (MESSy). These submodules are needed to implement emissions of chemical trace species into the model in a general way. I do appreciate the opportunity to publish documentation of important codes like modules of atmospheric models in ACP, as done here. A lot of atmospheric models and their modules are not well documented.

In detail, ONLEM handles online-calculated emissions and OFFLEM handles prescribed emissions. These can be prepared from the common EDGAR data base with the program EDGAR2NC. TNUDGE is a code for deriving (pseudo-)sources and sinks from known tracer distributions by the tracer nudging method. Two convincing examples for the application in GCMs are shown.

The technical note is very well written and I suggest it for publication in ACP with some minor revisions and technical corrections that I list below.

- The first paragraph in the introduction describes the advantages of the regridding tool NCREGRID that is described in detail elsewhere (Jökel, 2006). Even though this is not wrong, the paragraph may be shortened or even left out.
- p. 5487, l. 18: What do you mean by “code quality”?
- p.5490, equations (1) and (2): It may be mentioned that the factor in both equations is the inverse of the total number density of air molecules.
- p.5490, line 22: leave out “written in Fortran95”
- section 2.2.1: I suggest an introductory sentence like “In the following, examples of online emissions are shown that are already implemented in the code. . . ”
- Section 2.2.2: “two different algorithms” for sea salt: How is it decided which of the algorithms is used? I suppose it be chosen by the user.
- Section 3, application with the artificial tracer X. Such sharp gradients are artificial and would probably not occur in nature. However, this is a good example to document the working of the code.
- Figure 4, caption: replace "left" and "right" with "top" and "bottom"; also correct references to this figure in the text ;the title of the bottom figure, X($\mu$mol/mol), should belong to the top figure.



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- Summary: It would be nice to have a short information about availability of the code, usage conditions and software license in the text.
- Attachment/User manual: If possible, please include the exact link and citation of the paper on the top page of the supplement.

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Interactive comment on Atmos. Chem. Phys. Discuss., 6, 5485, 2006.