**Atmospheric
Chemistry
and Physics
Discussions**

Open Access

**Interactive
Comment**

Interactive comment on "Evaluation of a regional chemistry transport model using a newly developed regional OMI NO_2 retrieval" *by* G. Kuhlmann et al.

G. Kuhlmann et al.

gerrit.kuhlmann@gmail.com

Received and published: 19 April 2015

We like to thank reviewer 1 for his or her detailed feedback. As suggested we did a major revision of the manuscript which is attached to this reply.

The title has been changed to "Development of a custom OMI NO2 data product for evaluating biases in a regional chemistry transport model". Furthermore, first and second authors' affiliations have been extended. The abstract was also rewritten to account for the changes in the manuscript. The introduction (Sect. 1) has been rewritten and shortened based on the suggestions. Some small changes have been applied to

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

the background section (Sect. 2).

In the method section (Sect. 3), the two data processing subsections for HKOMI and CMAQ were merged and moved to the end of the section. A new subsection (Evaluation study) has been added which describes briefly the comparison done in our study.

The sections "results and discussions" and "discussions and conclusions" have been split in three sections: "results", "discussions" and "conclusions". This allows a more general discussion of the results and removes some repetitions. The discussions section has been extended to include much more discussions and references. The conclusions have been reduced moving large parts to the new discussions section.

A further OMI datasets has been added which computes AMFs with OMNO2 scattering weights and CMAQ profiles (OMNO2-SW). The influence of the ancillary parameters is now estimated by the differences (NMB and CV) between the six OMI datasets being more consistent. Examples are only used for further illustration. These changes allow for better comparison with other custom products. We removed table 1 and added a new table which shows NMB and CV between the six OMI datasets. The appendix has been moved into a new table. Figures 6 and 8 have been removed to the supplement.

Reply to general comments:

To 1) The naming convention and acronyms have been revised following the suggestion by reviewer 1. Wrong spelling and grammar have been corrected.

To 2) The paper has been shortened from 52 to 50 pages. This was achieved by removing some figures and tables to the supplement as well as by removing repetitions.

To 3) In the extended discussion section, we provide a more detailed comparison with other custom retrievals and evaluation studies.

Reply to specific comments:

To 1) As suggested, a new dataset has been included which computes AMFs using CMAQ NO2 profiles and scattering weights (OMNO2-SW). Furthermore, we agree that including DOMINO would be beneficial for this study. However, including the DOMINO data product would widen the scope of our study too much for one paper and will be left for future studies.

To 2) We provide now a brief explanation of averaging kernels and their influence on NO2 VCDs in the introduction and in the discussions. The expected real NO2 profile is discussed in Section 5.1.

To 3) We removed the discussion of old OMI NO2 standard retrievals from the introduction and focus instead on the latest version.

To 4) We agree that it would be more plausible to use the CMAQ model grid instead of a $0.01°\times0.01°$ grid. However, the gridding algorithm currently only supports longitude-latitude grids. This is explained in the paper now. We also added that $0.01°\times0.01°$ is about 1×1 km2 in the PRD region.

Reply to technical corrections:

Product names and OMI-related terminology have been corrected and are more consistent now. We adopted the suggested name for our custom product: Hong Kong OMI NO2 (HKOMI) product. Furthermore, we are using the term standard and custom products now. The term "datasets" is used to describe the compiled NO2 observations or simulations from OMI or CMAQ, respectively. We are also using level-2 for swath-level and level-3 for gridded data and are avoiding the potential misleading term global product for level-3 products. The title has been changed to

account for the changed name. Grammatical errors have been corrected.

Please also note the supplement to this comment:
http://www.atmos-chem-phys-discuss.net/14/C13018/2015/acpd-14-C13018-2015-supplement.pdf

Interactive comment on Atmos. Chem. Phys. Discuss., 14, 31039, 2014.

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper