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Atmospheric Chemistry and Physics Discussions

Interactive comment on "ECHAM5-wiso water vapour isotopologues simulation and its comparison with WS-CRDS measurements and retrievals from GOSAT and ground-based FTIR spectra in the atmosphere of Western Siberia" *by* K. Gribanov et al.

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Dear Editor, dear Authors,

The paper by Gribanov et al. presents water isotopologue data obtained by an isotopologue enabled Atmospheric General Circulation Model (AGCM) and measured by a commercial in-situ instrument as well as by ground- and space-based remote sensing instruments. The data are presented for a Western Siberian site.

The idea of using different isotopologue ratio measurement techniques is very interesting and in my opinion offers large potential for making significant progress in the field of atmospheric water cycle research. In this context the paper addresses a subject that is of great relevance for ACP.

While the sections that deal with the in-situ data and with the model data are well written I think that the sections that deal with remote sensing data and their interpretation require mayor modifications, which can be summarized as follows:

(1) In the introduction previous work on remote sensing of delD should be cited more carefully.

(2) I think the way the authors treat the remote sensing data does not sufficiently consider the complex nature of these data. I would like to recommend the authors to be more careful in their conclusions about the comparability of remote sensing data, on the one hand, and model data and in-situ data, on the other hand. For a more detailed explanation of my concerns the authors can look on similar comments I had during the review of two recently published GOSAT HDO/H2O papers: http://www.atmos-meas-tech-discuss.net/5/C2197/2012/amtd-5-C2197-2012.pdf and http://www.atmos-meas-tech-discuss.net/5/C2154/2012/amtd-5-C2154-2012.pdf.

(3) The authors' GOSAT retrieval using thermal nadir radiances is something new. So far GOSAT delD retrievals have been presented only for the near infrared. Can the authors please provide some references on these GOSAT measurements and/or refer to other work that uses this GOSAT spectral range? Since there is no reference about this new GOSAT thermal nadir HDO and H2O retrievals the authors should provide more details about it: spectral resolution/noise in this GOSAT thermal radiances (ideally compared to other thermal nadir sensors like TES and IASI), their intentions/experiences with error estimations, comparison to thermal nadir retrievals using IASI or TES, etc. I think that a paper exclusively dedicated to this GOSAT thermal nadir retrieval would be very welcome. Do the authors have plans for submitting such paper in the near future?

This is just a brief summary of my comments. Please find in the attachment a pdf document with all my detailed comments on the manuscript. I hope it helps for improving the manuscript. Please let me know in case there are problems in reading the comments I inserted in the attached pdf document.

Best regards, Matthias Schneider

Please also note the supplement to this comment:
http://www.atmos-chem-phys-discuss.net/13/C173/2013/acpd-13-C173-2013-supplement.pdf

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Interactive comment on Atmos. Chem. Phys. Discuss., 13, 2599, 2013.