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Interactive comment on "A method to derive the Site Atmospheric State Best Estimate (SASBE) of ozone profiles from radiosonde and passive microwave data" *by* E. Maillard Barras et al.

Anonymous Referee #1

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Review to the manuscript

A method to derive the Site Atmospheric State Best Estimate (SASBE) of ozone profiles from radiosonde and passive microwave data

by E. Maillard Barras, A. Haefele, R. Stübi, and D. Ruffieux

The authors present a time series of O3 profiles combined of Ozone sonde data and ozone measurements analysed from millimeterwave radiometry. In the manuscript the technique of how to combine the data products in described and the results are compared to satellite measurements.

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Interactive Discussion

Discussion Paper

Such a time series has certainly value because it may yield the connection of tropospheric and stratospheric ozone more directly than via a model.

However, I fail to see where the publication is describing a new measurement technique. It is about creating a new data product using existing data sets. Therefore I would suggest to transfer this publication to the copernicus journal "Earth system science data" and to make the data available to the community via a portal like www.pangaea.de, unless of course, the authors want to exploit the product for a scientific study in a later publication.

Also, I would suggest to exchange the publication Rodgers, D. C.: Characterisation and error analysis of profiles retrieved from remote sensing measurements, J. Geophys. Res., 95, 5587-5595, 1990.

by the publications

Rodgers, D.C.: Inverse Methods for Atmospheric Sounding, World Scientific Publishing Co. Pte. Ltd., 2000

and

Clive D. Rodgers and Brian J. Connor, Intercomparison of remote sounding instruments, J. Geophys. Res., 2003

to reflect the development in the technique of anlysing, characterizing and comparing remote sensing measurements.

Especially Rodgers (2000) declared the definition of the smoothing error given in Rodgers (1990) as wrong. Rodgers and Connor (2003) spell out how to compare different remote sensing measurements and summarize most developments in this field in earlier publications of the same authors.

Chapter 1

Ozone is also regularly retrieved fro solar absorption measurements and used in trend

studies (e.g. Vigouroux, 2014). Even though those measurements are not used here, they should be mentioned in the introduction along with all other possibilities to measure Ozone, even though the authors mention it later.

Chapter 2

page 3405, line 16

Please define the smooting error according to Rodgers (2000), page 49. Especially explain which covariance you used for the true ozone climatology, which is needed to calculate the smoothing error.

Chapter 4

I would suggest to make the characterisation of the SASBE profile more detailed. For example: how propagates an error in the O3 sonde profile to the combined profile and vice versa. Does the use of sonde profiles lower the error for O3 profile derived from the millimeterwave spectra? If so where?

Chapter 5

No information is given, how the 1SD difference of the respective comparisons is calculated. Please refer to Rodgers and Connor (2003) on how to do this.

Vigouroux et.al (2015) Trends of ozone total columns and vertical distribution from FTIR observations at eight NDACC stations around the globe. Atmospheric Chemistry and Physics, 2015, 15, 6

Technical remarks:

page 3402 line 6, please correct the citation page 3405 line 21, please add a link to the webpage of NDACC

Interactive comment on Atmos. Meas. Tech. Discuss., 8, 3399, 2015.