Atmos. Meas. Tech. Discuss.,
doi:10.5194/amt-2015-401-RC1, 2016

Atmospheric Measurement Techniques Discussions
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Interactive comment on "Tropical tropospheric ozone columns from nadir retrievals of GOME-1/ERS-2, SCIAMACHY/Envisat, and GOME-2/MetOp-A (1996-2012)" *by* Elpida Leventidou et al.

Anonymous Referee #1

Received and published: 17 February 2016

In the manuscript by Leventidou and co-authors, Tropical tropospheric ozone columns from nadir retrievals of GOME-1/ERS-2, SCIAMACHY/Envisat, and GOME-2/MetOp-A (1996-2012), monthly averaged tropospheric ozone columns from 1996 – 2012 for GOME/ERS-2, SCIAMACHY/ENVISAT and GOME-2/MetopA data are presented using a new CCD algorithm. Unfortunately, the manuscript as written fails to convince firstly of the actual necessity of a new algorithm, then of the validation of said algorithm and surely of the fact that this new data may be "used in climate models and tropospheric ozone trend studies" as the authors conclude. Summarizing the comments made inline the text, I found the text lacking many important points as to how the three

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Discussion paper

different satellite data were homogenized in order to produce a stable long term record; how the method was applied to all three datasets; how crucial choices with respect to statistical analysis were made [for e.g. why is the data in 2.5x5deg bins but are then compared to 5x5deg bins to the ozonesondes.] The error analysis section is not an actual error analysis, but a statistical consideration. As such, it should be changed, re-named and its focus re-established. Finally, the validation to the ozonesondes leaves a lot to be desired, whereas the validation with the other version of the SCIAMACHY tropical troposphere ozone columns is inadequate. I suggest that the team re-shapes the manuscript by including sections, such as the section of presenting the new dataset. One Figure out of 11 Figures, is not what one would call “present the data”. And also by excluding, to shortening sections, and re-establishing the focus.

Further to my comments in the text, the following major points may be made on tables and figures:

Tables 2, 3 and 4 require re-thinking and re-writing, as per my reservations about the relevant section and its findings. Figure 2, bottom plots: the legend is extremely difficult to read. Figure 3, no explanation given for the bottom plots, why are some histograms pink and others not? Figure 4, extremely difficult to understand and to extract relevant information from. I suggest a complete overhauling. Figure 6. Why not make similar maps from the LNM method on SCIAMACHY and compare these? Figure 10. I strongly disagree with this figure, with putting all ozonesondes, all satellites, all years, all seasons, all averaging techniques, in one pot and calculating a correlation as such. Remove this plot, which does not add any new information to what you already described in the text for each ozonesonde separately anyway. Figure 11. As already discussed, this does not show comparisons between the two methods but rather comparisons of each of the methods with the ozonesondes. I suggest you re-think this Figure and its accompanying section.

Please also note the supplement to this comment:

http://www.atmos-meas-tech-discuss.net/amt-2015-401/amt-2015-401-RC1-supplement.pdf

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