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comment

Interactive comment on "A study on harmonizing total ozone assimilation with multiple sensors" *by* Yves J. Rochon et al.

Anonymous Referee #2

Received and published: 16 October 2018

The manuscript titled "A study on harmonizing total ozone assimilation with multiple sensors" by Rochon and colleagues attempts to present efforts to assess the impact of assimilating total column ozone datasets from single and multiple satellite data sources with and without bias correction has been examined with a version of the Environment and Climate Change Canada assimilation and forecasting system. While the manuscript presents a wealth of comparisons and analysis, this is not performed in an optimal, easy to follow manner, and results in discouraging the reader as the information that might be of interest is scattered across the text. The crux of the matter, i.e. the improvement [or not] of the forecasts when assimilating [or not] specific satellite datasets starts in Table 4, already in page 34, and in Figure 10, already in page 36, without even counting the numerous Figures in the supplement which makes the

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Discussion paper

reading of this text even more confusing/tiring. I strongly suggest the following to the authors: 1. Consider shortening your paper significantly, either by omitting steps or by simply braking it down to a two-part paper where in the first [Part I] all material up to and including Section 3.2.2 should go into [as well as the associated supplement material] which would be the "preparation part". The rest [Part II] can be the assessment of the different bias, comparisons, outliers, runs, options a), b), c), etc., as well as the results can go into. 2. Consider adding a "roadmap" to this work right after your introduction. So that people who are interested in specific parts of this work can know which section to follow. For e.g. I suggest you write that : first you will show validation of the satellite sensor to be used as anchor, then you will show the whole bias correction, then you discuss the assimilation system, then the comparisons between the different assimilations you performed, etc etc. etc. 3. The whole "bias discussion" followed so closely by the OMI validation section, etc., is extremely confusing. From the results, one does not follow at all why you have to assimilate also GOME2A [which produces obvious problems] or GOME2B [since you already have two other TOC-providing sensors, OMI and OMPS.] Furthermore, the most important part [in my opinion] is the assimilation of the profiles [partial columns] of OMP and MLS but discussion/results on those is added as an afterthought at the end and not properly analysed. 4. The conclusions need a massive re-writing so as to give numerics to the work presented. I suggest you re-think the presentation of your results in a bullet-type manner so that actual findings can be easily understood and benefit other scientists.

In short, I suggest that the authors re-consider their entire strategy, to massively decrease the material in the supplement and change the focus of their paper. Please refer to attachment for further comments.

Please also note the supplement to this comment:
https://www.atmos-chem-phys-discuss.net/acp-2018-614/acp-2018-614-RC1-supplement.pdf

Interactive comment on Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2018-614, 2018.

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