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Discussions

Interactive comment on "Evaluation of version 3.0B of the BEHR OMI NO$_2$ product" *by* Joshua L. Laughner et al.

Anonymous Referee #2

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General Comments

The manuscript presents the comparison of an improved version of BEHR OMI NO2 product with NO2 vertical profile and total columns. The results show that the new BEHR NO2 product V3.0B performs better than previous versions and than OMI NO2 standard product, as compared to aircraft and Pandora ground-based measurements. The authors recommend the use of daily NO2 profiles when designing new algorithms fo geostationary missions. They also remind the importance of NO2 production from lightning in south-east US, that should be corrected. The manuscript is generally sound but it is quite technical, due to the large amount of different dataset compared to each other. I would suggest a few more plots for clarity. I recommend publication after addressing the following comments.

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Discussion paper

Specific Comments

1. Section 4. The comparison of VCD should include some scatterplots. Presenting the comparison as a table (Table 2) only is a bit difficult to follow. Especially, the results with separated Pandora and aircraft VCDs should be shown. Some of these plots could go in the supplementary material.

2. You use a quite precise spatial collocation criteria (pandora site within the OMI pixel, so no spatial smoothing in practice) and then you time average Pandora observations ± 1 h from the OMI observation, which is quite large time frame. Can you open a little bit about this choice? How does the results change with a shorter time interval?

3. You mention several times in the text that changes in emission information as input have a role in the discrepancies you observe between different versions of the algorithm. Could you actually show them? For example, plotting or mentioning the quantitative the emission changes over the areas of study.

Technical comments

4. Fig. 1: the plot is quite small, it could be a bit bigger so that the the different lines can be better separated? Also, the legend can be shown only once.

5. P12 L11 only Pandora data that has a coincident aircraft profile is include -> only Pandora data that have a coincident aircraft profile are included

6. Conclusions P17 L12 I think you refer to Sentinel 4, as Sentinel 5 is not planned on a geostationary orbit.

7. Figure 1 and 3: the different panels would benefit from a title mentioning the different sites considered in the plot

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