Atmos. Chem. Phys. Discuss.,
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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Trends and trend reversal detection in two decades of tropospheric NO_2 satellite observations" *by* Aristeidis K. Georgoulias et al.

Anonymous Referee #2

Received and published: 20 December 2018

The manuscript describes a compiled merged tropospheric NO2 dataset from different satellites covering the period 1996-2017. The work is well described and the trend reversal analysis is very convincing. Moreover the findings w.r.t. trends are well discussed in terms of socio-economic changes. The topic described in this manuscript is suitable for ACP.

The manuscript needs clarifications on the following points :

Major :

- I agree with the other reviewer that having all the equations in the Appendices is not optimal, also one would indeed like to see the result of each step on the data.

- I do not understand why CF1 has these specific systematic 'worm-like' patterns. Please explain.

- Why would CF2 (and CF3) be (so) different for each grid cell around the world. Please explain why that is. And can we then understand the observed patterns/behaviour ?

Minor :

- What is the expected effect of the max 1 hour difference in local overpass tie between the NO2 measurements from various satellites ?

- What is the uncertainty on all these CF1s, for example stdv on the 12 CF1s for each month ? I have no idea how well you can determine these CF1s.

- Same question for CF2.

- P6, l8, 'shown below' should be 'shown'

- P6.l10 'to one' should be 'to the one'

- Looking at Fig. 4 it looks like the yearly variation is much better fitted in the b) curves than in the a) curves. In fact it looks like the seasonal amplitudes are more or less fixed in the single linear trend analysis (a). Is that really a direct consequence of the reversal trend fit and not something prescribed in the linear trend fit ? I find the difference strikingly large.

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