Interactive comment on “Impact of synthetic spaceborne NO$_2$ observations from the Sentinel-4 and Sentinel-5p platforms on tropospheric NO$_2$ analyses” by Renske Timmermans et al.

Anonymous Referee #1

Received and published: 8 April 2019

The submitted manuscript deals with the very timely issue of making the best possible use of new upcoming Sentinel satellite products related to air quality. I found the manuscript very clear, concise and informative. It is basically ready for publication on ACP, I only have a very few requests for clarification/improvement:


- Models description in sec. 2.1 and 2.4: it would be useful to add information on the method/source of emission splitting/speciation, which is currently missing. E.g. how
NOx emissions are split in NO/NO2 or other nitrogen compounds? How the total VOCs emissions are speciated and then lumped in the model specific chemical mechanism? Also the information on chemical mechanisms used would be a useful to be added.

- On the EnKF corrections: in sec. 2.5.2 are briefly explained the "parameters" that are optimized by the assimilation procedure. However, in the rest of the manuscript, only the correction to emissions is shortly discussed (Fig. 16 and related text). What about the other parameters, e.g. ozone deposition velocy and boundary conditions (or others)? A brief mention to these would be also informative.

- Fig. 13: I suggest to revise the lines in the figure for improved readability. Indeed, on print the black, blue and purple look quite similar. Perhaps adding also a variation to the line style (e.g. dashed, dotted, etc.) would help.