

## ***Interactive comment on “Comparisons of ground-based tropospheric NO<sub>2</sub> MAX-DOAS measurements to satellite observations with the aid of an air quality model over Thessaloniki area, Greece” by Theano Drosoglou et al.***

**Anonymous Referee #2**

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Interactive comments on “Comparisons of ground-based tropospheric NO<sub>2</sub> MAX-DOAS measurements to satellite observations with the aid of an air quality model over Thessaloniki area, Greece” by Theano Drosoglou. Interactive comments on “Comparisons of ground-based tropospheric NO<sub>2</sub> MAX-DOAS measurements to satellite observations with the aid of an air quality model over Thessaloniki area, Greece” by Theano Drosoglou.

In this manuscript, the authors report on a comparison of ground based tropospheric NO<sub>2</sub> MAXDOAS measurements to satellite observations with the benefit of an air qual-

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ity model. The main point is the spatial resolutions between different instruments, for this purpose, different satellite data and model data were used.

The comparison of the MAX-DOAS data with satellite data is marginal fair. The main point of the comparison and rescaling is really fine but a better illustration of the context would be desirable. I recommend the publication after revisions as suggested here and the last review, please follow the general comments.

Comments: The map of satellite can show the variability of NO<sub>x</sub> and corresponding the emissions, this means, if the applied OMI data shows really the emitted from this area or not. The comparison of the NO<sub>2</sub> tropospheric from different sites (UC, RC and SC) is less relevant because the data are from different time periods, for such comparison, you need the same time period. The adjustment factors are more depend on the model data than OMI data; this rescaling can be used but it is somehow banal. Without any adjustment factors, the results can be seen from fig. 4, what I expect for OMI reconstructed. Generally, you can compare every ground based with every satellite with different time periods but in this case, you can not compare the results together.

P4, l16: direct sun light, we have only scattered sun light, but if we look directly in the sun (still scattered), the measured spectra have structures, which should be removed from the analysis. P5,l5: albedo: 0.1. The three different areas (UC, SC and RC) have definitely different albedos. Fig. 5 down: Some pixels are missing after averaging! Fig. 7: It is not clear to me, if you used all data from different campaigns with different time periods or not, if yes, they are not comparable in such form . You need a significant criteria, namely the same time period. Fig. 9: You can not compare the slopes from different time periods specially with seasonal difference!

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Please also note the supplement to this comment:

<http://www.atmos-chem-phys-discuss.net/acp-2016-611/acp-2016-611-RC2-supplement.pdf>

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Interactive comment on Atmos. Chem. Phys. Discuss., doi:10.5194/acp-2016-611, 2016.

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