

Interactive comment on “Analysis of European ozone trends in the period 1995–2014” by Yingying Yan et al.

Anonymous Referee #1

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The manuscript investigates the European mean, 5th and 95th percentile daily, daytime and nighttime ozone trends between 1995 and 2014, using surface observations from the EMEP network and the EMAC model. The manuscript is well written and organized and the level of the English language is good. It is suitable for publication in ACP after addressing the minor issues I have listed below.

General Comments

Why do the authors use only EMEP stations? There is also other networks available such as AirBase so that there can be an urban background vs. regional investigation of the ozone levels. I am aware that the EMAC model on a coarse resolution is not suitable to investigate the observed trends but limiting it only to the observations would I think increase the value of the paper.

Although the model is well-documented, I think a little more information can be provided for the model properties influencing ozone such as the chemical scheme. Also, more information on how the emissions are used in the model can be useful. Finally, other natural emissions such as dust, sea-salt as well as biomass burning must be explained. The biomass burning during summer time in southern Europe can have significant impacts on O₃ levels, which can explain some year-to-year variability.

It would also be interesting to show the spatial evaluation of the MAC model and discuss if there are regions with higher biases than others and why.

Specific Comments

Lines 107-109 is a repetition of lines 94-96.

Section 2.2. lacks motivation for why these analyses will be done for, although it is obvious. I think few lines would improve the flow and readability of the section.

Lines 147-149: Please write here explicitly how the emissions are kept constant? Are they fixed to 1995 or the mean of the period etc. . . ?

Line 190: The supplement figure should be referred here.

Line 231: the trends written in the text are slightly different than those on the plots, please double check.

Check the alphabetical order in the Reference list.

Krotkov et al. (2016) is missing in the text.

Langner et al. (2004) is missing in the reference list.

Change Lelieveld et al. (2000) with Lelieveld and Dentener (2010).

Fig. 1. It would be more interesting to see the e.g. annual mean O₃ distribution rather than the surface elevation.

Legends should be added to all figures with time series plots.

Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2017-1077>, 2017.

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