

Atmos. Chem. Phys. Discuss., referee comment RC1
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Comment on acp-2021-115

Anonymous Referee #2

Referee comment on "Origins and characterization of CO and O₃ in the African upper troposphere" by Victor Lannuque et al., Atmos. Chem. Phys. Discuss.,
<https://doi.org/10.5194/acp-2021-115-RC1>, 2021

Origins and characterization of CO and O₃ in the African upper troposphere

By Victor Lannuque et al.

General comments

Lannuque et al. presents a characterization of the carbon monoxide and ozone distribution and origin on the African troposphere based on a combination of airborne (IAGOS-MOZAIC) and satellite (IASI) measurements as well as models (SOFT-IO and NCEP). The data and analysis presented in this work is very valuable considering the limited number of measurements in the area. The analysis is methodologically sound and the overall goal of the work is within the scope of ACP. I recommend the publication of this work after the following comments are addressed.

Specific comments

Generally speaking, titles don't have a period at the end. Please correct.

The abstract is too long and has redundant information. For example, L31-34 is basically repeated in L37-39. I would suggest to rework the abstract to make it more concise.

P9 L254 I would refer to easterly winds rather than to 'Zonal winds < 0' in the second sentence of this line. I would also add units (m/s) to the 0.

P10 L264 The transition period is sometimes written as April-May and sometimes as AM (e.g. L265). I would suggest to use only the abbreviation after the definition in L246.

Fig. 2 presents relative humidity as a fraction of 1, while other plots shows it as percentage. Please correct to improve consistency. I would also remove the ticks on the y axis of panels i,j,k and l, as they are not coincident with the boxes shown. It might also be a good idea to show the NCEP output as a grey shading in the same way IASI is introduced in Fig. 4. That would provide a more quantitative comparison between the IAGOS in-situ met data and NCEP.

P22 L508 – LiNO_x is lightning NO_x? Please clarify (e.g. add abbreviation description)

P22 L487 '(which may be relevant????? should maybe mention this)' looks like a comment added by the authors during writing process.

Fig. 5. Please make the labels larger (specially the lat, lon ones).

Figs. 7, 8 and 9 show several levels in the troposphere and just one between 11 and 50 km. Does this level intend to show the stratospheric contribution (i.e. stratospheric intrusions)? Does it correspond to the average of several levels? 11 km doesn't seem to correspond to the stratosphere in the tropical region. Please clarify.

P28 L617 Join (iii) to the previous paragraph.

P33 L846-849 "Thouret, V., Marenco, A., Sabatier, P., Logan, J. A., Ndec, P. and Grouhel, C.: Comparisons of ozone measurements from the MOZAIC airborne program and the ozone sounding network at eight locations Goose is obviously one important to its has followed by a recent impact and Marerico greenhouse Staehelin Copyright by the American Geophy, J. Geophys. Res., 103, 1998." -> (?) Please revise this citation.

I would suggest the authors to carefully proof-read the document and look for consistency issues. For example, figures are referred as Fig., fig, Fig, etc. without consistency.