

Atmos. Chem. Phys. Discuss., referee comment RC1  
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## Comment on acp-2022-686

Anonymous Referee #1

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Referee comment on "Tropical tropospheric ozone and carbon monoxide distributions: characteristics, origins, and control factors, as seen by IAGOS and IASI" by Maria Tsivlidou et al., Atmos. Chem. Phys. Discuss.,  
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This paper "Tropical tropospheric ozone and carbon monoxide distributions: characteristics, origins and control factors, as seen by IAGOS and IASI" by M. Tsivlidou et al. provides a comprehensive description and assessment of O<sub>3</sub> and CO spatial and vertical distributions in the tropical regions. The manuscript is well written, clear and well-organized. By combining multi-annual analysis from IAGOS profiles, IASI retrievals and SOFT-IO outputs, the paper provides a suite of information important to study O<sub>3</sub> and CO in the tropical regions like the relative contribution of anthropogenic emissions, biomass burning and transport over different sites/regions. I recommend publication after that a few minor points are considered.

1) Paragraph 2.1. The term "accuracy" should not be used in a quantitative way. Do the author refer to the systematic error, instead (since the precision is quantified)?

2) Pag 5, line 127. "The RSE is defined as the \*fraction\*"...This is unclear. Do you mean \*ratio\*?

3) Figure 2. The stripes visible for ozone, need more discussion. These discontinuities do not represent geophysical features but uncertainty in the data products. For some regions discontinuities of 5-10 ppb were visible which could be considered a quantification of the uncertainty related to the use of the different a priori profiles. Are these spatial discontinuities visible also in other vertical layers? Moreover a kind of noise that was not discussed in the paper was visible for ozone over the desertic regions of the northern Africa and Arabian peninsula. Since especially the first feature affect the regional average values, I would like to see a discussion about potential impact to the obtained results.

5) Pag 23, line 489: please specify AMA

6) The analysis was mostly based on the IAGOS profiles at selected locations. Along the manuscript, the authors nicely discuss also the intra-regional differences observed at different sites in the same regions and attributed observed differences. Potential limitations for the results upscaling should be also highlighted in the Conclusion section.