

## Authors' response to reviewer #1

Please note that in this document, the referee's comments are in black, the authors' responses are in blue.

I thank the authors for carefully addressing my comments.

Thank you for taking the necessary time and effort to review the answers.

All is looking good, with one small exception: the sentence on line 88-89, referring to the CAMS Reanalysis: "CAMS carries several upgrades, such as improving horizontal resolutions, vertical levels, and the newer version of the satellite retrievals. CAMS uses various satellite observations, covering different time periods. " is a little confusing, and rather specifies the procedure for CAMSFC (as already described there). The whole point of the CAMS Reanalysis is that it tries to minimize any such upgrade changes, to establish a consistent time series. The system is updated only once every 8 years or so - i.e. not really relevant in this context to refer to 'upgrades'. There is no need to refer to a predecessor of CAMSRA. I'd suggest to clarify, or simply remove the sentence completely. If this is corrected then the manuscript can be published as such.

To be on the safe side, the sentence was removed.

## Authors' response to reviewer #2

Please note that in this document, the referee's comments are in black, the authors' responses are in blue.

Overall, the authors addressed my comments. I only have a few minor comments for the revised manuscript and suggest publication in GMD.

We thank the reviewer for taking the necessary time and effort to review the responses.

P1, 115-16: Results show the benefit of applying the LSTM method instead of using the original CAMS products for providing O<sub>3</sub> over Iran.

That was modified.

P3, 174: "These datasets specific to tropospheric ozone analysis". What do you mean here? Maybe "These datasets focusing on surface ozone"?

We mean that the focus is on the surface ozone. That was modified.

P3, 180: IFS (CB05)

That was modified.

P10-11, 1312-314: "The S variability results from the effect of daytime photochemical production, downward transport of O<sub>3</sub> rich from upper levels, combined with O<sub>3</sub> loss by depositions (in the surface layer)". "Results from" is somehow strong here, maybe "is associated with"..

That was changed.

P13, L400: upper troposphere in larger time scales (Zanis et al., 2014)  
Please also include here the study by Akritidis et al. (2016) (it was included in the initial manuscript), as it highlights the role of stratospheric ozone transport in tropospheric ozone over the examined region also.

References

Akritidis, D., Pozzer, A., Zanis, P., Tyrlis, E., Škerlak, B., Sprenger, M., and Lelieveld, J.: On the role of tropopause folds in summertime tropospheric ozone over the eastern Mediterranean and the Middle East, *Atmos. Chem. Phys.*, 16, 14025–14039, <https://doi.org/10.5194/acp-16-14025-2016>, 2016

That was added.

P5, 1145: "stratospheric-tropospheric exchange" -> stratosphere-troposphere exchange

That was corrected.

Conclusions: I suggest using bullet numbering or simple bullets instead of numbers in the form (1) (2)

...

The numbers were replaced with bullet points.

P15, 1457-459: I suggest to modify as follows: “In addition, uncertainties in emission inventories might affect this error. Including a proxy of stratospheric ozone contribution to surface ozone (stratospheric ozone tracer) may be beneficial in explaining sort term ozone variability, thus reducing the error (a recommendation for future work).”

That was applied.

P15, 1460: belongs to -> appears for

That was changed.

Table 1 caption: remove “some”

That was removed.