

***Interactive comment on* “Study of the dependence of stratospheric ozone long-term trends on local solar time” by Eliane Maillard Barras et al.**

Anonymous Referee #1

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In view of some recent work showing unexpected negative ozone trend in the lower stratosphere in the NH, a critical survey of possible systematic effects in ozone datasets is highly demanded. Therefore, the paper presented by Barras et al. studying possible effects of LST when deriving trends from MWR observation is a timely contribution in this context.

The paper is generally well written and is presenting its results well organized. It compares the Payerne observations with other instruments in order to homogenize the dataset and takes extensively care to eliminate impacts of various technical changes of the instrument. It extends the analysis by comparing the results with model results which essentially support the conclusions of the authors.

The paper needs in my opinion only minor changes. Some comments below and in the

attached pdf should give some suggestions how the paper can be improved.

General remarks

The motivation of the paper (reliable ozone trends after 2000) should be presented clearer and much further at the beginning of the paper.

The steps of the homogenization process should be summarized first, and the technical reasons what causes the differences should be shortly explained somewhat in addition. From Fig. 3, the bias from the technical interventions is significant. The authors are asked to show the full (deseasonalized) timeseries with and without applying the corrections.

The rationale of the search for LST dependence of the O₃ trend besides a more technical effect should be explained in the paper. As long as one is in a quasi linear domain, the LST should have only a small impact on the trend, I guess. This is what one can see in Para 4.2.3 Fig. 9 c).

Minor comments:

Please, see attached commented pdf.

Please also note the supplement to this comment:

<https://www.atmos-chem-phys-discuss.net/acp-2020-101/acp-2020-101-RC1-supplement.pdf>

Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2020-101, 2020>.

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Discussion paper

