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Comment on acp-2022-424

Anonymous Referee #3

Referee comment on "Technical note: Northern midlatitude baseline ozone – long-term changes and the COVID-19 impact" by David D. Parrish et al., Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2022-424-RC4, 2022

This is another in a series of papers from David Parrish, which all have as their main purpose to maintain that Parrish et al. (2014), was correct and subsequent work is all flawed. It is tiresome to keep refuting them. Parrish et al. (2014) was indeed a valuable contribution, in 2014, and its finding that tropospheric ozone had increased by a factor of 2-3 was challenging to models. However more recent work, particularly Tarasick, Galbally et al. (2019), which examined biases in historical measurements in great depth, has found smaller increases in surface ozone, of the order of 50%, which are in general agreement with model predictions. The analysis of ice-core data by Yeung et al. (2019), and the independent analysis of aircraft and balloon data by Tarasick, Galbally et al. (2019), also both support a smaller increase of surface ozone, of the order of 50%. Dr. Parrish's papers invariably fail to cite these corroborating analyses.

The main issue appears to be Dr. Parrish's insistence that his few selected sites, primarily in Europe, are more representative of "background ozone" than averages from the much more extensive TOAR set of rural ozone measurement records. There seems to be no justification for this other than Dr. Parrish's insistence. See Cooper et al. (2021), for a more extensive discussion.

The data presented all seem to be from previous publications. The sole novelty is the projection of Dr. Parrish's peculiar quadratic fit to 2020, using data up to 2018, and comparing it with other, more conventional linear fits. Since he is attempting to publish this in 2022, surely it is reasonable to insist that he extend his dataset to see which projection is closer to the observations? The current Figure 1 has all the interest of a weather forecast for 2020, made in 2018.

Cooper, O.R, D.W. Tarasick, I.E. Galbally and M.G. Schultz, Comment on acp-2020-1198, community comment on "Investigations on the anthropogenic reversal of the natural ozone gradient between northern and southern midlatitudes" by David D. Parrish et al., Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2020-1198-CC1, 2021

Tarasick, D.W., I. Galbally, et al., (2019), TOAR- Observations: Tropospheric ozone from 1877 to 2016, observed levels, trends and uncertainties, Elem Sci Anth, 7(1), p.39. DOI: http://doi.org/10.1525/elementa.376.

Yeung, L.Y., L.T. Murray, P. Martinerie, E. Witrant, H. Hu, A. Banerjee, A. Orsi and J. Chappellaz (2019), Isotopic constraint on the twentieth-century increase in tropospheric ozone, Nature, 570, 224-227, https://doi.org/10.1038/s41586-019-1277-1.