Review of Björklund, Vigouroux, Effertz et al: Intercomparison of long-term ground-based measurements of tropospheric and stratospheric ozone at Lauder, New Zealand (45S)

15 July 2024

Comments on the Revised Paper

  Overall, the paper is much improved and not far from suitable for publication. The most important improvements are: (1) clarifying the data version/quality and the inclusion of the Zeng et al. (2024) reference, that is now available to the reader; (2) the importance of the stratospheric results for LOTUS and stratospheric ozone assessment, ie the rationale for the paper, is better expressed and the theme carried through. Downplaying the TOAR implications, as the authors point out, is appropriate at this point.

The arguments for not reprocessing the sonde data for the "EnSci drop" and related concerns are reasonable *at this time*. However, the ~3% post-2016 total column ozone (TCO) dropoff over Lauder, although seemingly small, remains a robust signal that is affecting the results. The figure below is an update from this Reviewer's prior review, showing the dropoff now in comparison with 5 (rather than 4) TCO satellites. The dropoff in TCO is quite visible in **Figure 1** of the paper and must be stated explicitly by the authors. The dropoff appears to propagate into both the drift (lower stratospheric drift, **Table 4**) and trends (**Table 5**). Indeed, if a 'simple fix' were to add 3% to the post-2016 Lauder sonde data, the **Table 5** trends might decline from ~5%/decade to ~-2%/decade. An important "bottom line" then is that the sonde trend is even smaller than the LOTUS (Godin-Beekmann ref) estimate. Incidentally, there seems to be a stray line in line 623 ? in the manuscript. Line 625, "sonde dataset" not "sondes."

Small edits including the points made in the prior paragraph are needed for an acceptable revision. THANK YOU.

Figure showing ozonesonde 'dropoff' for TCO and stratospheric ozone in the Lauder record (Stauffer et al, 2022 update). Files were downloaded from RMI ftp site, 2024.