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Comment on amt-2020-497

James Kerr

Community comment on "Consistency of total column ozone measurements between the Brewer and Dobson spectroradiometers of the LKO Arosa and PMOD/WRC Davos" by Julian Gröbner et al., Atmos. Meas. Tech. Discuss., <https://doi.org/10.5194/amt-2020-497-CC1>, 2021

I found this paper by Gröebner et al, 2021 (G2021) interesting and informative. However, I would like to draw to the attention of the authors the research that was carried out many years ago investigating the effects of ozone temperature on ozone absorption and the resulting impact on Brewer/Dobson measurements.

At least two papers that are entirely relevant to the subject matter of G2021 should be appropriately included:

1) Kerr et al., 1988:

<https://agupubs.onlinelibrary.wiley.com/doi/abs/10.1029/JD093iD09p11129>

This is the first reported long term Brewer/Dobson colocated comparison of ozone measurements showing the systematic annual difference between Dobsons and Brewers. It is also the first to suggest that the seasonal difference in measured values could be due to effects of ozone temperature on ozone absorption coefficients. However, this early paper is not included in G2021, whereas, several other following references are cited on lines 35-40.

2) Kerr, 2002 (K2002):

<https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2001JD001227> This paper found that the convoluted absorption coefficients of Bass and Paur, 1985 required modification in order to "best fit" observed data at MLO and Toronto. It also found that the temperature dependence of the Brewer algorithm using the modified Bass/Paur coefficients is essentially zero. Table 2 of K2002 reports the calculated (unrevised) Bass/Paur temperature dependence (based on quadratic fits) as 0.094%/C in good agreement with that of the IGQ given in Table 2 of G2021 (0.104%/K). K2002 also reports the revised temperature dependence as -0.005%/C in good agreement with the IUP and IUP_A in Table 2 of G2021 (0.010%/K and 0.001%/K).

I should also point out that findings of K2002 are based on measurements made of absorption by atmospheric ozone using a Brewer instrument and the sun as a light source. The conclusions made by R2014 and G2021 are based on high quality (IUP) measurements made of absorption by ozone in the laboratory using a high resolution spectrometer and a lamp as a light source. The laboratory measurements are then

convoluted with the Brewer slit functions to determine the differential absorption coefficients. I find it quite remarkable that both the laboratory based measurements and the field based measurements have arrived to the same conclusion: i.e. the Brewer operational algorithm for measuring total ozone has little dependence on effective ozone temperature.