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Atmospheric Measurement Techniques Discussions

Interactive comment on "Operational considerations to improve total ozone measurements with a Microtops II ozone monitor" *by* J. L. Gómez-Amo et al.

Anonymous Referee #1

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It would be useful to obtain the original wavelength bandpasses measured for the filters for the three UV channels and compare computed weighted average alphas (for a 300 DU case with air mass equal 2) to those from the calibration analysis. Even if these cannot be obtained, the effective wavelengths for each of the three UV channels for each of the three calibrations studies should be reported in Table 1. These would give a better idea as to whether there is physical explanation related to changes in the bandpasses for the disparate results. It is not clear to this reviewer that the filters used in MicroTOPS should/would behave as the observations imply they have.

It would also be useful to know how much better/poorer the comparisons with Brewer and other measurements would be if the middle calibration results were discarded, that is, only the first and last were used with interpolation for the intervening years. Table 2 certainly suggest this calibration is bad. Further, can the authors comment on the following: 1. Was the calibration data for the middle case taken with a much different instrument temperature than the other cases? 2. Were the absolute signal levels of the individual UV channels significantly different from those for similar expected signal levels among the three cases? 3. Did the ozone measurements from the other ground-based instruments show any diurnal variations during the calibration periods? Was there any screening for SO2 column amounts from the Brewer measurements?

Following up on question 2 above, the absolute signal levels of individual channels can be used to help screen for aerosol, cloud, and pointing complications. Were these investigated in the comparisons with ground-based measurements? The relative signal sizes between the three UV channels can also be used to investigate when stray light may start to be a significant error in the shortest channel. That is, one assumes that the stray light in the shortest channel has sources similar to the longer channels signals and sees how much more rapidly the shorter channel signal decreases than the longer ones. These changes will be related to the airmass, mu, times the ozone amount, Omega, (with additional smaller effects from the Rayleigh term) so the errors in Channel I retrievals (or Channel III) should be plotted against this product, not just airmass. (E.g., in Figures 5 and 6 where Omega may vary for the different data sets, make the x-axis Omega*mu.)

Following up on question 3 above, global daily ozone maps from satellites can prove useful to compare the biases of ground based stations as the same satellite instrument will view two locations and statistics may be collected over extended periods and a range of conditions. Have the different Brewer/ground stations in this study participated in such intercomparisons? The daily ozone map at the time of a calibration sequence can also be checked to see if there are large gradients in the ozone field surrounding

a ground site If there are, then this suggests that there may be systematic changes in the ozone over the site during the time period of measurements.

Figure 3 provides very limited information except for the ten cases with the largest aerosol optical depth variations.

Interactive comment on Atmos. Meas. Tech. Discuss., 4, 7529, 2011.