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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Differences between ground Dobson, Brewer and satellite TOMS-8, GOME-WFDOAS total ozone observations at Hradec Kralove, Czech" *by* K. Vanicek

Anonymous Referee #1

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The paper presents interesting and very valuable data concerning total ozone measurements performed from ground (by Dobson and Brewer instruments operated at Hardec Kralove (Czech Republic)) in comparison with two type of satellite instruments, namely TOMS vs. 8 data and GOME measurements retrieved by the WFDOAS algorithm. The careful comparison shows characteristic differences. The reported differences of ground-based measurements are probably mostly attributable to different wavelengths used in Dobson and Brewer instruments and the different temperature sensitivities of their ozone absorption coefficients and atmospheric sulfur dioxide whereas the causes of the differences in the seasonality of the used satellite measurements are less obvious to me. I have three major concerns: 1. Earlier analyses

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showing partly the similar results should be given more credit (Weber et al., ACP, 2005) and the reader should be informed where he can find the used WFDOAS data. 2. I noted that much of the references concern “gray literature” and I encourage the author to use reviewed papers whenever possible and possibly shorten the reference list (I don’t see why the statement about reporting of Dobson and Brewer stations needs to be documented by a Ozone Quadrennial contribution (see p. 5841, line 6)). 3. I also recommend that the author extends the theoretical part of the paper so that those ACP readers which are less familiar with the scientific subject can follow the paper. Further comments 4. p. 5842, line 1: I am not completely convinced that term “differential optical absorption spectroscopy” is appropriate for Dobson measurements. 5. p. 5842, line 14: “bad” weather means that the pathway between the instrument and the sun is obscured by clouds 6. p. 5842, line 21: Replace “But” by “However” 7. p. 5842, line 24: Add point at the end of the sentence. 8. p. 5843, line 21: I recommend to explain the term “TOeff” also emphasizing the instrumental differences caused by the different wavelengths used in the two types of ground-based instruments and their temperature dependences of the ozone absorption coefficients. 9. p. 5843, last sentence: I think the Brewer total ozone measurements are much less dependent on TOeff than Dobson values but I am not sure whether Brewer measurements are completely temperature independent. 10. Sub-title 2.4: Possibly change to Statistical Representativity of monthly mean values 11. I also agree with the comments of the other reviewer related to 2.4 regarding the problem, namely that the used procedure assumes randomness of missing data, which might not be true (which should be mentioned) 12. p. 5845, line 23: I suggest to replace “experiment” by “analysis” 13. p. 5845, line 23: Ĕ. months Ĕ (add n, spelling error) 14. p. 5846, line 4: Ĕ. of the required numbers of days Ĕ 15. p. 5846, line 15: I think, the statement that Kerr et al. (1988) did not find a significant seasonal bias between Dobson and Brewer measurements is not correct, please check 16. p. 5846, line 25: I believe, that the seasonal bias between the Dobson and the Brewer measurements are attributable to the different wavelengths used in the instruments and the seasonal variation of stratospheric temperature 17. p. 5847, first statement:

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I believe that the wavelengths used in Brewer instruments are more important for the weaker dependence on ozone temperature 18. p. 5848, last paragraph: Please add more details how TOeff was calculated 19. p. 5852: I suggest to add here the reference of Weber et al., 2005, as they have reported similar results 20. Figure 1: What is the period of the measurements, please add this information in the Figure Caption 21. Figure 2, 5 and Figure 6 need proper labeling of the years 22. Figure 7: I think the Figure could be made more attractive, possibly by using colors. 23. I recommend editing of the manuscript by a native English speaker

After taking into account all listed comments I recommend publication of the paper in ACP.

Interactive comment on Atmos. Chem. Phys. Discuss., 6, 5839, 2006.