

Interactive comment on “Retrieval of ozone column content from airborne Sun photometer measurements during SOLVE II: comparison with coincident satellite and aircraft measurements” by J. M. Livingston et al.

Anonymous Referee #1

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Livingston et al. describe their methods and results for retrieving the ozone column content from their Sun photometer measurements on board the NASA DC-8 aircraft during SOVE II. Comparisons with satellite measurements and similar instruments on-board the DC-8 are also presented as consistency tests of their method. This is a nice and thorough paper describing a very difficult measurement. The difficulty arises from the fact that these solar occultation measurements are being performed at really high solar zenith angles, with the sun very near the horizon. At such high solar zenith angles

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the airmass factors become more uncertain and the assumption of homogeneity along the line of sight becomes less appropriate. However, the authors fully elaborate their methods, assumptions, and sources of error. Their results are presented clearly and in the end I could find no real fault with this paper since things were so well explained. I agree with the first reviewer that this paper is basically a primer on how to retrieve column ozone from airborne Sun photometer measurements.

Specific comments: The only issue that bothered me a bit concerned the authors' use of the SAGE and POAM vertical profiles of ozone and aerosol extinction to derive the airmass factors used in the AATS-14 analysis. This seems a bit circular, using the SAGE and POAM profiles to derive airmass factors for the derivation of column ozone from AATS-14 that are then compared to the column ozone from SAGE and POAM. Does this bias the comparisons toward better agreement? Does this method limit the usefulness of the sun photometer measurements for satellite cal/val purposes?

Interactive comment on Atmos. Chem. Phys. Discuss., 5, 243, 2005.

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