

Interactive comment on “Validation of ozone measurements from the Atmospheric Chemistry Experiment (ACE)” by E. Dupuy et al.

Anonymous Referee #1

Received and published: 9 April 2008

This paper is a thorough intercomparison of the early results from ACE/FTS and ACE/MAESTRO with a variety of concurrent measurements from other satellites and from ground and balloon measurements. The authors find a high bias of FTS with respect to many other instruments in the mesosphere. They find general agreement within uncertainties of FTS with other instruments between 16 and 44 km. They find a bias of MAESTRO sunrise measurements with respect to the sunset measurements when compared to POAM and SAGE sunrise and sunset measurements. Overall, I think that this paper will provide a useful reference for intercomparisons of many instruments.

All of the comparisons are useful and important to record in the literature. However, the paper does not go the important further step that I would consider to be the most

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important. The SAGE and HALOE measurements extend over a 25-year time period providing a key long-term data set of so-called "self-calibrating" solar occultation measurements of the ozone profile. This data set has been extensively used in the literature and in assessments to demonstrate the long-term decline in stratospheric ozone and to search for beginnings of attributable ozone recovery. The solar occultation measurements on ACE could and should continue this important record. To do so requires an assessment of any offset between the measurements during the overlap period of the satellites. For this purpose, Figures 2-5 are the most important. They show some clear differences that would need adjustment to make a consistent data set. I understand that it is beyond the scope of this paper to actually put together continuous time series from multiple satellites, but I would like to see some clear recommendation as to how to use the ACE data to continue the important satellite solar-occultation time series.

Overall the paper is very long and somewhat tedious to read. The comparisons to the multitude of other ozone measurements are useful, but overwhelming. I think of this kind of exercise as using the ACE measurements as a transfer standard to compare other measurements that are not co-located. If the authors accept this view, it would be interesting for them to reach some conclusions about what they have learned from this comparison about those other measurements. It would be helpful to the read if the authors could figure out how to reduce the number of figures from 47 to a smaller number. I do not have specific suggestions on this, but will comment below on some of the issues I have with a few of the figures.

Figures 2 and 4: I believe that there are standard error of mean bars on the graph, but I cannot see them. It would be useful to state that they are there in caption. This is significant because it says that the differences are real.

Figure 6: the legend is very small and difficult to read.

Figures 34 and 35: What are the standard errors of the mean?

Figures 36 and 37: I didn't find these useful.

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Figures 40 and 41: These are unreadable. I get no message from them.

The conclusion reached via Figure 46 is that there is remarkable agreement between ACE-FTS and other measurements in the 16-44 km range. But there are also remarkable differences, particularly with SAGE II and HALOE. Because I think that these are important time series to be continued, I think that the differences need to be highlighted in the conclusions.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 2513, 2008.

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