

Interactive
Comment

Interactive comment on “Characterization of Odin-OSIRIS ozone profiles with the SAGE II dataset” by C. Adams et al.

C. Adams et al.

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Thank you for your comments, which have helped to improve our manuscript. Below we address the recommended changes point-by-point.

P.1036, lines 8-9 “ We... demonstrate that OSIRIS ozone data are suitable for analysis of ozone trends...” For trend analysis, the stability of the data is needed. However, OSIRIS stability is not demonstrated in the paper.

We have changed this to:

“... demonstrate that the OSIRIS data have the potential to be combined with the SAGE II dataset.”

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Discussion Paper



P.1040, l. 1-2: "It was found that the smoothing width had minor effects on the comparison results, unless it was set to values that were much larger than the OSIRIS vertical resolution." Two comments here: (1) it is unclear why the experiment of smoothing much exceeding OSIRIS vertical resolution has been performed. (2) Indeed, smoothing should not have a significant effect on bias; smoothing affects mainly standard deviations. Please clarify what you mean.

We have addressed this by changing the text to the following:

"The smoothing of the SAGE II data had <1% influence (in absolute difference) on both the mean relative difference between all coincident profiles and the standard deviation in the mean relative difference for 21.5-39 km. At high and low altitudes small improvements to the standard deviation (~1-4%) were observed when the data was smoothed."

P.1040, Figure 2: Please discuss a larger local variability (on short time scales ~1 month) in OSIRIS data compared to SAGE-II data.

This was addressed by included the following text in the paper.

"Throughout most of the time series, SAGE II and OSIRIS appear to measure similar variability in ozone. During some periods, the SAGE II data appear more compact because measurements are taken only during a 1-2 day window, while OSIRIS measurements over several days cannot be distinguished in the figure. However, the larger variability observed by OSIRIS at 35 km in May-August cannot be explained by differences in spatial or temporal sampling."

P. 1042, l.14: "The addition of dynamical coincidence criteria to match similar air masses did not significantly improve correlation coefficients or standard deviations." Please quantify the effect.

We have added a figure like Fig. 3, showing global comparison results including the dynamical coincidence criteria. With this figure, we have also included the following quantification of the effect:

“The global comparison results are shown for dynamical coincidence criteria in Fig. 5. When the dynamical criteria are applied, ~2000-4000 coincidences remain, depending on the altitude layer. Mean relative differences are within 0.5% of mean relative differences for the broad coincidence criteria at altitudes above 18.5 km. Standard deviations improve by < 3% (in absolute difference) and global correlation coefficients improve by < 0.04 at all altitudes compared with the broad coincidence criteria.”

P.1042. I suggest changing the subsection title "Latitude" into "Dependence on latitude" or similar.

This was changed to “Dependence on latitude and season” as a new figure showing the seasonality of the agreement has been added.

Fig.6 What are m, y? (seem to be regression coefficients). I suggest also writing directly regression equation instead of the coefficients.

These have been described in the figure caption, with the following: “The R correlation coefficient is indicated by R, the slope is indicated by m, and the y-intercept is indicated by y.”

In section 5, the last paragraph presents a discussion of further using the obtained results, future data merging. Therefore I suggest to rename this section into "Summary and discussion" or similar.

This has been changed, as recommended.

P.1048, l. 7: comparisons WITH other datasets

This has been changed, as recommended.

P.1048, l. 13-14: "This document describes..." Please rephrase the first sentence.

This has been changed to: “This appendix describes the screening procedure that is applied to the retrieved OSIRIS ozone profiles prior to the distribution of data.”

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P.1049: l. 25: "Scans with ozone or aerosol values that deviate from the ozone or aerosol values well beyond the variance are rejected" . Please quantify this "well beyond".

This was clarified with the following text:

"For most altitudes, scans with ozone or aerosol values that deviate from the mean by more than $5\text{-}\sigma$ or from the median by more than 10-MAD are rejected. These criteria are loosened at the top and bottom of the profiles to account for larger natural variability."

TECHNICAL CORRECTIONS

p.1034, l.13, "was"→ "is"

This was changed, as recommended.

Figures 3 and 4: Please enlarge font size and use the full width of the page.

The panels were rearranged so that they could be more easily read.

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