

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

### **Anonymous Referee #1**

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The work presents a detailed comparison between Odin-OSIRIS SaskMART v5.0x and SAGE II v7.0 ozone profiles. The aim of the paper is to characterize the OSIRIS SaskMART v5.0x ozone profiles and provide the necessary preparatory information to merge them with the SAGE II data set. The methodology and the results are explained and presented well. The following issues should be considered by the authors:

1. P1034; L9: Can this information really help to merge other data sets than OSIRIS SaskMART v5.0x ozone to SAGE II? This probably should refer to the discussion in the paper, that other data sets should be included because OSIRIS does not cover all latitudes during all seasons? Since no additional data set is included in this work, I would rather omit “and other satellite ozone measurements” here.

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2. Dynamical coincidence criteria are presented and their influence on the results is discussed by the authors, but it is not shown in any figure. I would suggest to show Fig. 5 (only 5a or both panels), for both broad coincidence criteria alone and including dynamical coincidence criteria.
3. There are difficult dependencies of the latitudinal, diurnal, and seasonal sampling of Odin-OSIRIS. Although the seasonal dependence of the differences to SAGE II is probably dominated by the dependence to the optics temperature there could be additional information in a comparison for different seasons. Figures showing the seasonal dependence (Fig. 5 for different seasons or a figure similar to Fig. 5 for all seasons) could be included, e.g. as additional figure, additional panel for Fig. 7, or in an electronic supplement. This would also underline, why seasons are mentioned in Table 2.
4. Is it not relevant for the merging to estimate drifts between SAGE II and OSIRIS? Are there any significant drifts between these instruments despite the short overlap time period?
5. Section 4.2: P1043, L9–10: A reference should be given where the diurnal variation of ozone is described, if possible including an estimate for its magnitude.
6. Section 4.4, P1046; L22: Could the bias be related to not detected polar stratospheric clouds instead of or additional to aerosols?
7. P1049; L25–26: is there a fixed threshold for this selection, e.g.  $5\sigma$ ?

### **Technical and typographical corrections:**

- P1034, L18: “exceed 5% under several cases” - “for” instead of “under”?
- P1035, L14: “spanning 21 years” instead of “span 21 yr”?

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- P1035, L 21ff: try to clarify which letters are used for the SI<sup>2</sup>N acronym, e.g. use underlined or bold letters.
- P1037, L1 and L28: "are" instead of "were"?
- P1037, L29: here, and at several other places in the text is a "-" before "km"?
- P1038, L11: "measurements"?
- P1038, L12: "during which both instruments measured."?
- P1039, L1 and P1043, L17: The term "twilight" seems misleading when discussing solar occultation measurements?
- P1040, L2–3: the information in this sentence was already given on P1039, L25. Therefore, it should be omitted.
- P1040, L16–18: this sentence is rather long and complicated, maybe split it into two shorter ones?
- P1041; L9: refer to Eq. 1?
- P1042, L3: "seasonal and spatial variability"?
- P1044; L2: "viewing geometry"?
- P1048, L9: "should" or "must", probably not both?
- Figure 2: something is wrong with the label on the y-axis ("10<sup>12</sup>" instead of "10<sup>12</sup>").
- Figure 3 and 4: try to sort the panels differently to display them larger.