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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Gauss-Seidel Limb Scattering (GSLS) radiative transfer model development in support of the Ozone Mapping and Profiler Suite (OMPS) Limb Profiler mission" *by* R. Loughman et al.

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Response to Anonymous Referee #2 for Loughman et al. (2014):

We appreciate the suggestions offered, and see relatively few areas of possible disagreement. Point-by-point responses follow:

Suitability for ACP: We are open to transferring this article to AMT. We have not pursued it so far for purely practical reasons (we were midway through the payment process for

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Interactive Discussion

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the publication when the suggestion was originally made), but will continue to confer with the editors to determine the best journal for publication.

Connection to OMPS: We cannot offer a clear connection to OMPS LP retrieval performance as part of this manuscript. The OMPS LP algorithms are currently under revision, and we plan to introduce material covering the RT model impact as part of a more general description of the updated algorithms when they are complete. If the lack of this material necessitates a change in the current manuscript title, we're willing to make that change.

- We concur with the idea of consolidating the model description in an initial section, and the revised manuscript will be reorganized along the suggested lines.

- The OMPS LP instrument will also be briefly described in the main text of the revised manuscript.

- We appreciate the suggested references, and will incorporate them in the revised manuscript.

- An explanation for the use of Siro as a reference model along the suggested lines will appear in the revised manuscript.

- The multi-zenith model will be discussed more thoroughly in the suggested Appendix B, to answer the questions related to the placement of zeniths, cone boundary, etc.

- Anonymous Referee #1 suggested "multiple solar zenith angles" as a better phrase than the phrase "multiple zeniths", "the local zenith", etc. Along those lines, we will replace "the zenith" with "the local zenith" or "the local solar zenith angle" as warranted.

- Fig. 6 will be revised to remove extraneous symbols and clarify the cone boundary scheme.

- The calculations featured in Fig. 11 use the number of solar zenith angles indicated in Fig. 12, placed as described in the text. To make the exact conditions clearer, we

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will add a table indicating the number and locations of the solar zenith angles along the LOS for the calculations illustrated in Fig. 11.

- Your interpretation of the zeniths is correct (and hopefully the added table referenced in the previous bullet will clarify this). "nzen_gt_6" means that the radiances did not reach sufficient accuracy with 6 solar zenith angles along the LOS. Since this occurred only for solar zenith angles greater than or equal to 85 deg (where the present GSLS radiances are not expected to be accurate), we simply noted this discrepancy and did not continue to add solar zenith angles in the testing done for this manuscript.

- We will add a corresponding UV comparison to the 600 nm comparison shown in Fig. 16 in the revised manuscript.

- We will revise the conclusions to indicate 1-3% radiance error for the updated GSLS model.

Interactive comment on Atmos. Chem. Phys. Discuss., 14, 19315, 2014.