

Interactive comment on “Retrieval of stratospheric aerosol size information from OSIRIS limb scattered sunlight spectra” by A. E. Bourassa et al.

A. E. Bourassa et al.

Received and published: 27 August 2008

Thank you to the referee for a thoughtful and encouraging review. We agree that more background information regarding how this retrieval of stratospheric aerosol parameters relates to other published results would be helpful. We have included an expanded discussion in the revision of this paper and have made reference, in particular, to the works suggested by the referee.

With respect to the second main issue, we also believe that a full validation of the retrievals is required, as is the case with all satellite data products. However, we would like to stress that this paper is meant to be a technique paper with focus on the retrieval method. The development follows from the first technique paper referenced here ex-

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tensively (Bourassa, JGR, 2007) and we believe that the results of the case study are sufficient to justify the technique. With this focus, we feel that this is not the place to include an extensive validation. However, a full validation of the technique including multiple instruments and multiple wavelengths is certainly valuable and is currently underway. It will be the focus of an upcoming paper. As a side note, it should be noted that the value in this technique is not simply the “slight improvement of the earlier inter-comparison” as stated by the referee, but is the independent ability to infer information about the size distribution that greatly improves the robustness of the technique (for example, as shown in the paper, the assumed size distribution can be off by up to a factor of two).

Other minor points:

We have included reference to the other occultation instruments and other limb scatter aerosol retrieval work in the introduction section of the revision. We have also included reference to Angstrom’s original 1929 paper.

The role of the phase function is indeed important and the referee is completely correct in that the scattered radiance is proportional to the product of the cross section and the phase function. We have noted this in the discussion; however, for particle sizes typical of background conditions this is not a big concern since the phase function varies relatively slowly with particle size (we have now included a reference to McLinden et al., 1999 that discusses this result).

The error bar is that derived in Bourassa, JGR, 2007. (This is now clarified in the revision).

The wavelength interval at for comparison with SAGE III 1538 nm is not actually a more sensitive test given that an OSIRIS retrieval is performed at 1530 nm. The 1020 nm wavelength is a nice test because it is significantly removed from both OSIRIS wavelengths (750 nm and 1530 nm), and also because both SAGEII and SAGEIII make measurements at this wavelength.

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We have been more specific about how we refer to the wavelengths. Thank you for this correction.

The comparison with SAGE II and SAGE III is meant to demonstrate not only the quality of the OSIRIS result, but also the level of agreement that one would expect, given instrument and sampling differences. As such, the SAGE II/SAGE III relative difference is not irrelevant.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 4001, 2008.

ACPD

8, S6397–S6399, 2008

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