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Interactive Comment

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

Anonymous Referee #1

Received and published: 23 April 2008

This paper expands upon earlier work (using OSIRIS limb scattered spectra to obtain number density profiles of stratospheric aerosol) to derive one piece of size information - mode radius - using an addition IR channel. I find this work relevant and very interesting. The addition of OSIRIS to the mix of other stratospheric aerosol size data should prove extremely valuable given its good sampling. The methodology is sound. I recommend publication of this paper once some points, including one major issue, are adequitely addressed.

Error sources:

This method appears to assume that the neutral atmosphere is well known, the refrac-



tive index is known (I found no mention of refractive index at all!), and any other model parameters (albedo, etc...). Would an imperfect knowledge of these lead to additional biases above and beyond that obtained in deriving the number density? Either quantify these or show that they are not important. Do errors increase towards a SZA of 90? If you are trying to show that this method has potential then you need to show that these unknowns do not dramatically impact the result.

Minor points

Would it not be better to quantify the aerosol size in terms of effective radius which is a more robust quantity accross different functional forms of the size distribution, as well as more instructive and less sensitive to the distribution width?

How do the cross-sections/extinctions compare with SAGE III out at 1500 nm (assuming SAGE III does a retrieval at this wavelength)?

I think it would be instructive to show a plot of cross-section vs. wavelength for a derived particle size distributions, with error bars, along with some cross-sections for other particle size distributions.

Comment on how this method would perform under volcanic conditions - larger optical depths, larger particles - both in general and relative to an occultation instrument.

Abstract, end: How much data has been used to derive the quoted uncertaintly estimate (15%)? If it is just the one scan used in the figures then you need to clarify that this is the case but much more preferable would be to base this on additional comparisons.

Figures 3 & 4: what do the error bars on the OSIRIS traces represent?

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

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