

Interactive comment to “The Aerosol Limb  
Imager: acousto-optic imaging of limb  
scattered sunlight for stratospheric aerosol  
profiling” by B. J. Elash et al

B. J. Elash et al. (brenden.elash@usask.ca)

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We would like to thank the referee for their helpful comments and suggestions. Below are the referee's comments in italics followed by our reply.

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*Equations should have numbers. Now some of them have random identification numbers.*

**Reply:** This has been corrected in the AMTD published version.

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*p. 8, l. 2: Telecentric and telescopic systems. I am not familiar with these terms. Perhaps you could define them briefly.*

**Reply:** Brief descriptions of the terms were added. "... telecentric and telescopic systems. The telecentric system uses a layout that removes perspective from the image and object plane and the telescopic system uses a telescope as the front end optics."

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*Sec. 3.3: Please provide some quantitative estimates of the magnitude of the stray light compared to the signal.*

**Reply:** Using an average of the entire FOV a signal to noise ratio of 40 is noted. A sentence has been added into section 3.3.

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*p.17, l. 16: The value of  $z_{ref}$ ?*

**Reply:** The following sentence has been modified to include the typical values of  $z_{ref}$ . "For the ALI measurements, the highest possible tangent altitude where the signal is above the noise threshold is approximately 30 km tangent height and typical values for  $z_{ref}$  were between 27 and 30 km"

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*p.17, l. 16: Perhaps you should differentiate the observed values from the modeled values by improving notation ('m' or 'model',...).*

**Reply:** The notation model has been added to the equation.

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*p. 17, l. 28: Is MART better than, for example, Levenberg-Marquardt minimization? What is the function you minimize by MART? Is it quadratic distance  $(y_{obs}-y_{model})^2$  or something else?*

**Reply:** The MART method minimizes the function  $y_{obs}/y_{mod}*\ln(y_{obs}/y_{mod})$ . For application used here MART and Levenberg-Marquardt return similar results. MART was selected since the OSIRIS aerosol product uses MART

and would help to negate errors from algorithm differences in comparing the results.

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*Fig. 7: What are the thin horizontal and vertical lines?*

**Reply:** No thin horizontal or vertical lines are noted in the figure produced for the AMTD paper.

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*Fig. 8: Fig. (a) looks very dark.*

**Reply:** Fig. 8 (a) brightness has been increased by 20% and makes the image easier to read and view. See supplement for updated figure.

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*Fig. 10. Provide the zenith angle step used to generate the dashed and solid lines.*

**Reply:** For the measurements during the mission a zenith angle step of approximately 2 degrees occurred. Dashed lines represent solar zenith angles greater than 90 degrees, solid line are profiles with solar zenith angles less than 90. A sentence in the figure caption has been added to include this information.

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*p.20, l.28: Tack or tackle?*

**Reply:** Corrected in AMTD published version.

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