

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.

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

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

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."

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.

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"

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.

*p. 17, l. 28: Is MART better than, for example, Levenberg-Marquadt minimization? What is the function you minimize by MART? Is it quadratic distance $(y_{obs_model})^{**2}$ 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-Marquadt return similar results. MART was selected since the OSIRIS aerosol product uses MART and would help to negate errors from algorithm difference in comparing the results.

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 paper.

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.

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.

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

Reply: Corrected in AMTD published version.
