

Interactive comment on “Comparison of aerosol optical depths from the Ozone Monitoring Instrument (OMI) on Aura with results from airborne sunphotometry, other space and ground measurements during MILAGRO/INTEX-B” by J. M. Livingston et al.

Anonymous Referee #1

Received and published: 26 May 2009

Review of the paper “Comparison of aerosol optical depths from the Ozone Monitoring Instrument (OMI) on Aura with results from airborne sunphotometry, other space and ground measurements during MILAGRO/INTEX-B” by Livingston et al .

General comments

This paper discusses a very thorough comparison of OMI aerosol optical depths (AODs) with aircraft measurements (by the AATS sunphotometer) and MODIS AODs

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during the MILARGO field campaign over and in the vicinity of Mexico City during March 2006. AODs from the OMAERUV and OMAERO retrievals are compared to the AATS and MODIS retrievals. Though there are only a limited number of available pixels available for comparisons, since satellites quickly pass over aircraft positions, the paper does thoroughly examine the differences between the different data sets. The comparisons indicate important differences between the different data sets. The paper overall does a very good job in pointing out the difficulties encountered in measuring tropospheric aerosol from space and difficulties in validation of these measurements. Some of the retrieval difficulties may be due to errors in the assumed surface albedos.

This paper adds substantially to the previous literature. The paper is very well written. The paper should be published after minor changes.

Specific comments

Page 9968, line 22 Are absorptive aerosol optical depths available during the MILARGO field campaign? What about AERONET single scattering albedos (from which the absorptive AODs can be derived)? If available, then the comparison of the OMI absorptive optical depths with the correlative measurements would add substantially to the value of the paper, since the paper points out on page 9968 that the OMI absorptive AODs are more reliable than the total AODs. Please cite references to the validation of absorptive AODs, if available.

Technical corrections

Use “above sea level” and “above ground level” instead of “a.s.l” and ‘a.g.l” in the abstract. Define these abbreviations in the text.

Page 9967, line 15 Change “and uses only a small part in the near UV” with “and uses only a small range of wavelength in the near UV”

Page 9979 Are MODIS AODs not available? If available, they could be placed in Figure panel 7e. I particularly think it is good to see the MODIS data in the figures, since they

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indicate the wavelength dependence of the AODs.

Page 9983 Are MODIS AODs not available? If available, they could be placed in Figure panel 12c.

Page 9983, line 21 Revise to “layer near T2, combined with variable surface terrain below the flight track, prevented the”

Page 9984, line 27 It would be helpful to mention in the Figure 12 figure caption that the J31 never flew lower than 420m. There will be some readers who will quickly scan through the paper, and not be aware of this important point. Add the information in the figure caption to avoid the careless reader from forming an incorrect conclusion.

Page 9989, line 16 Revise to “that the overwater aerosol was “. Is overwater conditions implied here? If so, please add the clarifying adjective.

Page 10008 Add the MODIS label in panel 9b.

Page 10013, Figure 14 The figure legends are very hard to read. Please increase the font for these legends.

1. Does the paper address relevant scientific questions within the scope of ACP? yes
2. Does the paper present novel concepts, ideas, tools, or data? This is a validation paper, and appropriate standard techniques are used in the paper. 3. Are substantial conclusions reached? yes 4. Are the scientific methods and assumptions valid and clearly outlined? yes 5. Are the results sufficient to support the interpretations and conclusions? yes 6. Is the description of experiments and calculations sufficiently complete and precise to allow their reproduction by fellow scientists (traceability of results)? yes 7. Do the authors give proper credit to related work and clearly indicate their own new/original contribution? yes 8. Does the title clearly reflect the contents of the paper? yes 9. Does the abstract provide a concise and complete summary? yes 10. Is the overall presentation well structured and clear? yes 11. Is the language fluent and precise? yes 12. Are mathematical formulae, symbols, abbreviations, and

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units correctly defined and used? yes 13. Should any parts of the paper (text, formulae, figures, tables) be clarified, reduced, combined, or eliminated? yes 14. Are the number and quality of references appropriate? yes 15. Is the amount and quality of supplementary material appropriate? The question does not apply to this paper since the paper is complete as is.

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 9961, 2009.

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