**Atmospheric
Chemistry
and Physics
Discussions**

Interactive
Comment

Interactive comment on "Validation of the GRAPE single view aerosol retrieval for ATSR-2 and insights into the long term global AOD trend" *by* G. E. Thomas et al.

Anonymous Referee #2

Received and published: 9 February 2010

General comments

The paper presents (i) validation of retrieved aerosol optical depth over ocean derived from the ESA ATSR-2 instrument for 1995-2001, (ii) estimation of global and regional trends (over ocean) from the instrument, and (iii) comparison with the AVHRR GACP aerosol dataset for the same time period. The methods for deriving the data are discussed in other papers, but briefly outlined here. Overall this is a worthwhile paper, as there are few global records for this period. It is particularly interesting that dataset shown in this paper as disagrees with the GACP dataset significantly both in magnitude of aerosol loading and direction of trends. A concern is the large (0.08) bias and r.m.s

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

error (0.13) shown in comparison to AERONET, which have similar to the magnitude of ocean ambient aerosol. Generally the work is well done and reported, and should be published, but a number of clarifications are needed.

Specific comments:

1. The results of all parts entirely concern aerosol over the ocean. Both the title and abstract should reflect this clearly. It would be better to remove discussion of the land surface elements of GRAPE almost entirely as they serve only to confuse and distract, and replace with a sentence or two and a reference.

2. Abstract (and later fgure3, results section, conclusions) state a "correlation of 0.79" with AERONET. Which correlation measure here: Pearson's r^2 or r, or some other?

3. Line 94: retrieval of aerosol from "near-nadir satellite radiometers"- unclear exactly what this means.

4. Line 155: report error of AERONET in measured AOD of < 0.01: Need toclarify the meaning of this - at a certain wavelength, with/without temporal or spatial averaging?

5. 165- : A little unclear what satellite data is being compared. Is it the mean of derived aerosol from AATSR over a 40x40km area? Is this weighted by uncertanties in the retrieval?

6. 195 onwards - & Figure 3: It would be helpful to provide a table showing the performance over the various AERONET sites used. Also, presumably the OA retrieval method provides an error estimate – it would be interesting to compare the error estimates provided with actual error distributions as compared with AERONET. Is it possible some of the bias (0.08) is due to undetected cloud?

265: Eq 3, missing division line

A final point is comparison of the regional and global datasets (e.g. Fig 5) – are the data weighted to give equal area, after gridding, or do the results show a simple average of

Interactive Comment

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

gridcells?

The comparison is interesting, particularly as it reveals differences in the sign of trends. It emphases the need for further study, as it is unclear from these datasets what the true magnitude of interannual variation is. In particular, the estimates are likely to be sensitive to cloud screening and temporal sampling. It would be interesting to compare further datasets, but as far as I am aware these are currently the only available which date back to 1995.

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 21581, 2009.

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper