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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Spatial variation of aerosol properties derived from satellite observations" *by* C. Robles González et al.

Anonymous Referee #1

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General

In their paper the authors deal with the retrieval of aerosol optical depth (AOD) from observations of the Along Track Scanning Radiometer (ATSR) onboard ERS-2. The algorithm benefits from the dual view capability of the sensor. The authors compare the results with simulations performed with the air quality model LOTOS, which includes sulphate and nitrate formation. They found a fairly good agreement between the spatial patterns of satellite and model based AOD. The quantitative match is worse, because LOTOS does not include all aerosol types. The article is an interesting contribution to the remote sensing of aerosols and its link to air quality modelling.

Title

The title refers only to the satellite material of the paper and disregards completely the

model sections.

Abstract

The most important findings are sufficiently well summarized.

Section 1

It would be helpful to find a short description of the dual view retrieval algorithm, although the detailed knowledge is not required for understanding the paper.

Section 2

p358, l15 Which radiation transfer model and which aerosol compositions have been used?

p358, l19 Mention the maximum number of overpass days (11) already here, not only in the context of Figure 2. Add a variance plot for the sake of consistency with other figures.

p359, l12 What are the contributions to the mean uncertainties of AOD over land (e.g. calibration uncertainties)? Are the values the same for various land use categories? Is the standard deviation calculated over all possible land use categories?

p359, l16 AODŠs based on the dual-view algorithm are claimed to be worse than the single-view results retrieved over coastal water, the latter being within a factor of 2 with sun photometer measurements. This factor reveals a rather large uncertainty of the results. Is that true, in particular also for large AODŠs?

p360, l13 Does Figure 2b show the temporal variance over the number of clear sky overpasses or the spatial variance over the 10 km x 10 km grid cell?

Section 3

p363, l10 Which particle size distributions are included in LOTOS (constant, variable, etc)?

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p364, l10 Is TNO3=(NH4)NO3+HNO3? Give the definition of TNO3.

p364, l9 A geographic map of the experimental sites would be helpful.

Section 3

p366, l7 Omit 'of this mean'. You likely address the variance of the retrieved AOD samples, which are obviously scattered around their average value. In statistics, the variance of the mean also exists and quantifies the accuracy of that average value.

Section 4

p368, l9 Which aerosols should or will be included in LOTOS (secondary organic aerosols, dust, etc.)?

Table 1

Misprint MEDITERRAMEAN

Figures 1 and 2 Either put 'a)' and 'b)' close to the respective panels or replace them in the caption by 'top' and 'bottom', respectively.

Figure 3 Increase the character size

Figure 5 and 6 Increase the character size. Omit 'of this mean'. Either put 'a)', 'b)' and 'c)' close to the respective panels or replace them in the caption by 'top', 'center' and 'bottom', respectively.

Figure 7 to 9 Increase the character size

Interactive comment on Atmos. Chem. Phys. Discuss., 3, 355, 2003.