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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.

C. Robles González et al.

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We would like to thank the referee for the constructive comments. The following are the answers to the specific comments.

Title: The title has been changed from: "Spatial variation of aerosol properties derived from satellite observations" to "Spatial variation of aerosol properties over Europe derived from satellite observations and comparison with model calculations". Reference to the model has been included in the title as suggested by the reviewer.

Section 1: Answer to comment 1: The description of the dual view and single view algorithms are published in the literature and those papers are cited in our manuscript. However a short description of the algorithms has been included in section 2.

Section 2: Answer to comment 2: The radiation transfer model and aerosol composition are also briefly described in the new section.

Answer to comment 3: The maximum number overpass days (11) are now mentioned in section 2.

Answer to comment 4: The contributions of the mean uncertainties of AOD over land are ascribed to the assumptions made in the algorithm and the differences of modeled aerosol types from the real aerosol type. Obviously over brighter surface the aerosol contribution will be determined with lower accuracy than over dark surfaces. However, unfortunately not enough sunphotometer measurements were available to estimate the uncertainty related to surface reflectance. This paragraph has been included in the manuscript.

Answer to comment 5: The single view uncertainty is about 0.04 over sea. This uncertainty can be up to a factor of 2 only for low AOD values. In the revised version of the manuscript the sentence about the factor 2 is deleted.

Answer to comment 6: Figure 2b shows the temporal variance over the number of clear sky overpasses. This explanation is included in the revised version of the manuscript.

Section 3: Answer to comment 7: LOTOS contains an implicitly assumed constant size distribution for accumulation mode particles. This information is included in the revised version of the manuscript.

Answer to comment 8: TNO3 is the sum of nitrate and nitric acid. The ammonium ion presented by the reviewer is not included in the sum, but the model of course only contains ammonium nitrate.

Answer to comment 9: A geographic map of the experimental sites is included in the revised version of the manuscript.

Answer to comment 10: In the revised version of the manuscript the words "of this mean" are omitted.

Section 4: Answer to comment 11: The aerosols which should be included in LOTOS are (primary) carbonaceous, sea salt and dust aerosols Primary carbonaceous

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aerosols are planned to be included in the LOTOS model in the near future.

All the tables and figures have been changed following the reviewer suggestions. In figures the character size has been increased and (a), (b) or (c) have been included close to each figure when needed.

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