**Atmospheric
Measurement
Techniques
Discussions**

Interactive comment on "The inter-comparison of major satellite aerosol retrieval algorithms using simulated intensity and polarization characteristics of reflected light" *by* A. A. Kokhanovsky et al.

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Review of the paper amt-2009-101 The inter-comparison of major satellite aerosol retrieval algorithms by A.A. Kokhanovsky et al.

General comments. In this paper the algorithms are compared on synthetic data, computed by a radiative code and provided to the various participants; the participants received the specific data that would be observed by their instrument. The synthetic

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data are computed for a simple aerosol model, above a black surface. The comparison concerns mainly the aerosol optical depth (AOT) retrieved by the various instrument algorithms. This is a very good idea, as it avoids the discrepancies between various instrument results due to calibration, cloud screening, and treatment of the surface reflectance. The comparison concerns mainly the AOT retrieval by algorithms, and additionally the retrieval of information on aerosol model and refractive index. However, a difficulty remains, because most algorithms include some assumption on the possible aerosol models, and make a choice between these models. Wether the model chosen for computing the synthetic data is or not close to the models considered in the retrieval, obviously introduces a bias in the favor or the disadvantage of this algorithm. Five instruments are concerned by the intercomparison: MODIS, MERIS, AATSR, MISR, POLDER, and presented with their algorithm(s) in section 4. The paper is definitively useful and worth of publication. However the writing needs many improvements.

Specific comments. First the descriptions of the various algorithms, obviously written by different participants, need to be homogenized. More important they must be clarified, shortened and made more focussed toward the objective of the paper. For example, in MODIS, why mentionning 36 wavelength bands, as only 7 are used over ocean (table 1); it would be more useful to insist that only 4 of these 7 wavelengths are used over land; in another place, it is said 3 and 6 ?? Information on the swath and spatial resolution are also irrelevant here. Similar remarks could be made for other instruments. In table 1, Glory is mentionned; this needs a comment, as it is not yet operating and not used in the paper. Section 4.6 "Summary" ; the title is misleading, it is only a summary of section 4. It would be better to replace it by an introduction to this section 4, which is rather confusing.

For MODIS, there are two different algorithms, over ocean and over land. In figures 9, 11, 12 and 13, only one is presented, without specifying that it is the algorithm for land surfaces. In figure 10, appears a comparison between MODIS over land, and MODIS

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over ocean; this comparison should be included in the general figures. For MERIS, there are two different results in the figures (NASB-1 and NASB-2); they are not described in section 4.2. Some participants use their operational code, other use a specific version for the intercomparison; this needs to be underlined. The list of acronyms in table A3 is far from being complete (e.g. ARC, RAY, AERONET, MODTRAN, and many others); choose between BRF and BRDF.

Section 5 on results, is the most important section; it needs to be shorter and more striking. The symbol signification must be repeated in each figure (12, 13a). Some figures are too small and not readable (14,16). In figures 9 and 12, the results for MISR/PSI do not appear. In figures 11 and 12, the absolute error increases with AOT. What about the relative error ? What are the two solid lines ? In figure 13 what is the pink solid line ? The text mention a dashed line ? The retrieval of models and phase function (figures 15, 16, 17) are poor. In the legends, ORAC, JPL,.. are not clear references to the algoritm (or instrument)

Conclusion. The paper is interesting, but needs important modifications before being published.

Interactive comment on Atmos. Meas. Tech. Discuss., 2, 3369, 2009.

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