

Interactive comment on “Where do we need additional in situ aerosol and sun photometer data?: a critical examination of spatial biases between MODIS and MISR aerosol products” by Y. Shi et al.

Anonymous Referee #6

Received and published: 12 September 2011

The paper by Y. Shi et al. suggests tracing spatial discrepancies between MODIS DB, DT and MISR AOT products in order to improve the quality of the retrieval over corresponding areas. The paper is definitely suitable for AMT and well-written, and should be published after addressing a number of comments and technical corrections suggested by the other reviewers. A general comment on the concept of the paper may be added to the previous comments, as the paper currently gives a misleading impression about the status of the AOT retrieval problem: One of the purposes of the paper

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is to show the benefit of local measurements for satellite retrievals, namely, MODIS DT, MODIS DB and MISR. However, the initial concept of building more ground based stations to improve satellite retrievals seems to be not feasible. Satellite retrievals do not correspond to each other even for simple simulated cases (Kokhanovsky, A. A., et al., 2010: The intercomparison of major aerosol retrieval algorithms using simulated intensity and polarization characteristics of reflected light, Atmos. Meas. Techniques, 3, 909-932). The authors should be careful to clearly express the idea behind the paper. At the moment it seems like all what is needed for resolving the discrepancies between MODIS and MISR is more AERONET sites, which is a wrong impression. The title of the paper and corresponding parts of the text should be therefore changed.

Also, AERONET network is a unique source of ground truth aerosol data, but its proper maintenance cannot yet be considered a solved task. Suggestion to install additional stations in the areas where the station density is already above average is not convincing and seems to be an unaffordable luxury. Especially when one takes into account e.g. only about 15 stations for the whole Arctic, operating without proper calibration for years.

A very important point is the need of full quotation of the corresponding literature on the subject. Comparison of MODIS, MISR and AERONET, as well as integrating the three for better quality of AOT product is not a new idea and the previous experience in the area cannot be ignored.

The manuscript needs to be refocused: while it is of course not incorrect to discuss the use of more ground-based data, the use of other approaches (comparison with AOT products from yet another sensors or simulation studies) should also be discussed for the sake of clarity of the context.

Interactive comment on Atmos. Meas. Tech. Discuss., 4, 4295, 2011.

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