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Interactive comment on “Statistically optimized inversion algorithm for enhanced retrieval of aerosol properties from spectral multi-angle polarimetric satellite observations” by O. Dubovik et al.

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Received and published: 3 April 2011

Dr. Zhao,

We thank you for your helpful comments and for the interest in the proposed algorithm. We have carefully analyzed all your comments and suggestions and addressed them in the revised version of the manuscript and in the comments below.

1. All typos and errors that you have identified in the manuscript were corrected.

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2. We agree that clarifying the importance of the polarimetric measurements is a very important and interesting aspect especially for accessing full potential of the spectral multi-viewing polarimeters such as POLDER or APS. At the same time, it is rather complex question that cannot be correctly answers in one or two paragraphs. Thorough analysis is required. Currently, we are conducting the studies that should demonstrate the importance of polarimetric measurements and other aspects in respect to the sensitivity of POLDER like observations to aerosol properties. The results of these studies are planned to be published in follow on paper. If you are interested, we can communicate the preliminary results of these studies directly to you prior the publication.

3. As you suggested, we have added to the paper the clarifications regarding current performance of the algorithm. At present, the inversion takes about 10 sec per one POLDER/PARASOL pixel. It is too slow for implementing operational (not even real – time) processing of POLDER/PARASOL data. For inverting the observations of such instruments as APS/GLORY such speed of the retrieval is probably acceptable. At the same time, we have not done yet the optimization of the algorithm performance. We are working on such optimization now with the objective of retrieval acceleration by 50 to 100 times.

4. Your question: “Authors indicate “the retrieval outliers with the fitting residual higher than 5% were eliminated from the final results”. What may be the causes of these outliers and what is the rough percentage of outliers relative to the valid retrievals?”

The answer: The most probable cause of such outliers is inhomogeneity of the atmosphere over inverted pixels due to un-screened cloud contamination. We plan to discuss this in details in separate paper.

Interactive comment on *Atmos. Meas. Tech. Discuss.*, 3, 4967, 2010.

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