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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Retrieving global sources of aerosols from MODIS observations by inverting GOCART model" *by* O. Dubovik et al.

Anonymous Referee #1

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This treatise presents the results of a Herculean research effort. The idea and the effort are admirable. The implementation of the idea is impressive. I am not convinced that the multiple a priori assumptions made during the retrieval don't have a significant effect on the retrieval result, but an effort like this one is necessary to either verify that this approach can work or to dismiss it as too idealistic and subject to too much human selectivity. I recommend the publication of the paper essentially as is. However, I would like the authors to at least comment on the feasibility of applying their methodology to two datasets which provide unique information not available with other space instruments but have their unique limitations. I refer to the CALIPSO lidar, which provides unique height information, and APS, which will provide unique microphysical information [1, 2]. Both instruments are limited to a pixel-wide cross-track swath often

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referred to as gale-bar coverage, unlike the less capable passive imagers like MODIS and MISR. What is more important to the retrieval strategy proposed in this manuscript: precise height and microphysical information or less detailed and accurate information available over a significant cross-track swath?

Another, less scientific, suggestion is to break the text into much shorter paragraphs. Some of the paragraphs in the current manuscript are two-page long.

1. L. R. Poole, D. M. Winker, J. R. Pelon, and M. P. McCormick, “CALIPSO: global aerosol and cloud observations from lidar and passive instruments,” Proc. SPIE 4881, 419-426 (2003).

2. Mishchenko, M. I., B. Cairns, G. Kopp, C. F. Schueler, B. A. Fafaul, J. E. Hansen, R. J. Hooker, T. Itchkawich, H. B. Maring, and L. D. Travis, 2007: Precise and accurate monitoring of terrestrial aerosols and total solar irradiance: introducing the Glory Mission, Bull. Amer. Meteorol. Soc. 88, No. 6 (in press; http://glory.giss.nasa.gov).

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 3629, 2007.