

Interactive comment on “Intercomparison of CALIOP and MODIS aerosol optical depth retrievals” by C. Kittaka et al.

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The manuscript titled " Intercomparison of CALIOP and MODIS aerosol optical depth retrievals " by C. Kittaka, D. M. Winker, M. A. Vaughan, A. Omar, and L. A. Remer presents an extensive inter-comparison of collocated in time and almost in space (CALIPSO orbit is shifted to avoid MODIS glint) CALIPSO-derived Version 2.01 and MODIS Aqua Collection 5 AOD. This study is an important and valuable contribution as it provides insights into some of the strengths and limitations of the CALIPSO and MODIS datasets. This work also presents a rigorous CALIPSO data screening technique useful for many CALIPSO data applications. The paper is clearly written, and certainly appropriate for publication in Atmospheric Measurement Techniques.

Interactive
Comment

The minor comments are following:

1. CALIPSO daytime data is very noisy, and, in addition, MODIS aerosol retrievals in the vicinity of sun glint can be biased high due to contamination of the radiances. 0.532 μ m and 0.55 μ m AOD can be different for an aerosol with a large spectral slope. Therefore, differences between MODIS and CALIPSO AOD are to be expected.
2. As the authors mention, the extinction retrievals from a backscatter lidar are under-determined, and additional assumptions, in particular an aerosol model are required. AOD is not a primary CALIPSO product. An interesting follow-on study could consider how CALIPSO profiles are affected if AOD and aerosol models from collocated MODIS retrievals are used to provide the necessary constraints.

Recommended Disposition: Accept the manuscript in the current form.

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