

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.

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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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