



Innovative retrieval methods of aerosol and cirrus cloud optical depth above water clouds and ocean surface, and its application for ATLID calibration/validation activities.

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We have developed in the frame of the CALIPSO mission two innovative techniques allowing to derive aerosol and cirrus cloud optical depths from backscatter lidar measurements over ocean surface and water clouds.

We will present the underlying principles of the methodologies and how they can be applied to calibration/validation activities for the EarthCare mission, specifically the future ATmospheric LIDar (ATLID) aerosol and cirrus cloud optical depth dataset.

We will present several examples of their validation against the measurements from the NASA Langley airborne High Spectral Resolution Lidar (HSRL) and the Cloud-Aerosol Lidar and Infrared Pathfinder Satellite Observation (CALIPSO) space borne Lidar in clear air.

We will show how we can validate the ATLID aerosol and cirrus cloud data using column integrated atmospheric optical depths derived from ATLID ocean surface backscatter measurements together with collocated cloud radar ocean surface backscatter cross section or wind speed measurements.

We will also show how we can validate the ATLID aerosol and cirrus cloud data using above cloud optical depths derived from layer integrated water cloud ATLID lidar backscatter measurements.

Finally, we will also show how we can validate ATLID level 1 data using the lidar backscatter measurements of ocean surface and water clouds when there are no aerosol and cirrus clouds.

These different activities will provide a quantification of the accuracy of L1 and L2 space lidar data that ESA will be able to use in future quality assessments.