

# The selection and pre-processing algorithms of CALIOP lidar data

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The combined lidar and radiometer sounding (LRS) technique provides comprehensive investigations of the atmospheric aerosol aimed at retrieving altitude distributions of aerosol optical parameters and aerosol mode concentrations in an inhomogeneous aerosol layer. However, the insufficient number of coincident lidar and sun-radiometer stations restricts the scope of LRS for monitoring atmospheric aerosol. Data of the satellite lidar CALIOP (Cloud-Aerosol Lidar with Orthogonal Polarization) can be used as a “space” part of input information in advance version of LRS technique. Results of the LRMC-17 (Lidar & Radiometer measurement campaign-2017) cooperative measurements demonstrate feasibility of the combined terrestrial and satellite variant of LRS-technique for studying distribution of aerosol concentration over large regions using AERONET (Aerosol Robotic Network) data and results of sounding by satellite lidar, like CALIOP [1].

We present the selection algorithm of compatible measurements of the satellite lidar CALIOP and AERONET sun-radiometer (in time and space), particularly filename formation of CALIOP lidar data required for processing and downloading observation images, and the pre-processing algorithm of CALIOP lidar data, particularly cloud signal filtering, calculation of optical thickness, molecular and extinction profiles.

## Reference

- [1] Chaikovsky, A. P., *et al.*, 2019: Implementation of synergetic observations by terrestrial and space lidar systems and sun-radiometer for study of large scale aerosol changes. *Proc. SPIE* **11047**, 110470Z, doi:10.1117/12.2516356.

Preferred mode of presentation: Poster