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A new constituting lidar network for global aerosol observation and monitoring: Leone

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In order to observe and monitoring the direct and indirect impact of natural and anthropogenic aerosols on the radiative transfer and climate changing, it is necessary a continuous worldwide observation of the microphysical aerosol properties. A global observation it is of great support to the actual research in climate and it is a complement in the effort of monitoring trans-boundary pollution, and satellite validation, valorizing the use of lidar and passive sensors networks.
In this framework, we have created the LEONET program, a new constituting worldwide network of EZ Lidar™ instruments. These lidars, developed by the French company LEOSPHERE, are compact and rugged eye safe UV Lidars with cross-polarisation detection capabilities, designed to monitor and study the atmospheric vertical structure of aerosols and clouds in a continuous way, night and day, over long time period in order to investigate and contribute to the climate change studies. LEONET output data, in hdf format, have the same architecture of those of NASA Micro Pulse Lidar Network (MPLNET) and will be soon available to the scientific community through the AERONET data synergy tool which provides ground-based, satellite, and model data products to characterize aerosol optical and microphysical properties, spatial and temporal distribution, transport, and chemical and radiative properties.
In this work, it is presented an overview of the LEONET products and methodologies as the backscattering and extinction coefficients; the depolarization ratio, cloud layer heights and subsequent optical depths, provided to the limit of detection capability from a range of 100 m up to 20 km as well as the recent automatic height retrieval method of the different Planetary Boundary Layers (PBL). The retrieval algorithm in the future will be improved integrating, when possible, a measured Lidar ratio by a co-located sun photometer Further are presented some data examples from several diverse sites in the network.