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Aerosol climatology of tropospheric aerosol profiles over Athens, Greece using an elastic-RAMAN lidar system (2000-2005)

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Systematic measurements of aerosol backscatter, extinction, integrated backscatter, and optical depth using an elastic-Raman lidar system, at 355, 387 and 532 nm have been performed over Athens (37.9^o N, 23.6^o E, 200 m asl.]) Greece. All lidar data were obtained in the frame of the EARLINET project (2000-2003) and also beyond. The lidar profiles were obtained in the lower troposphere typically from 500 m to 5000 m asl. The high quality of the lidar data has been previously assured by extensive intercomparison at software and hardware levels within the frame of EARLINET. A large amount of aerosol profiles has been recorded by the elastic lidar system during daytime and by the Raman lidar system during nighttime. A statistical analysis has been performed to evaluate the optical properties of aerosol over Athens and observe their seasonal variations. Mean values and variances of the aerosol backscatter and extinction profiles, integrated backscatter, and optical depth have been evaluated. The corresponding seasonal cycle of these quantities shows highest values during the summer period and secondary maxima during the autumn/spring period. Small fluctuations have been found only during the winter months. High aerosol integrated backscatter values were found during the summer period, due to larger dust concentrations in the lower troposphere due to long-range transport of dust from the Saharan desert region.

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