



Atmospheric Aerosol Optical Properties over Lecce, Italy

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Tropospheric aerosols properties have been measured by LIDAR in Lecce (40.33°N, 18.10°E), Italy, along the Earlinet project, starting from May 2000 to date. The regular measurements on a predetermined schedule, three measurements per week, compose the so called climatological data base. In particular, in night time, acquisition of Raman signals from atmospheric nitrogen was possible, thus aerosol backscattering and extinction could be determined without assumptions. The analysis of the measurements of Lecce from the beginning until August 2002 shows that the aerosol load (optical thickness and integrated backscattering) has a seasonal cycle peaked in summer months. Also the height at which the aerosols are confined increases in summer months; this height ranges typically between 1000 and 2500 meters, but in summer months it can increase until about 6000 meters. A similar behaviour is found during Sahara dust transport events, but very few such events are present in the climatological data base for summer months. Consequently the dust detected in the free troposphere is probably due to the absence of aerosols removal due to stable anticyclonic conditions in the Mediterranean area. It is found that the aerosols contained in the range 2500-6000 m are in average characterized by a lidar ratio higher than the aerosols contained in the lower part of the atmosphere and that the difference is statistically significant. The 4-day analytical backtrajectories reveal that aerosols in the low troposphere are more likely of marine origin, and this could explain the difference in lidar ratio. Further backtrajectories analysis is in progress to determine the origin of the free troposphere aerosols.