



Column aerosol extinction properties as initial conditions for fog formation in a polluted environment: preliminary study

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Aerosols play an important role in the fog lifecycle by providing droplet condensation nuclei and by affecting the radiative budget. PARISFOG is an intensive field measurement campaign taking place in the Paris region to understand the physical, chemical, and dynamical processes leading to formation, expansion and dissipation of fogs in a polluted environment. PARISFOG is hosted from November 2006 to April 2007 by the SIRTa atmospheric observatory, located on the plateau of Palaiseau (156 m above sea level), 15 km South of Paris. This work is a contribution in defining the initial conditions of fog formation. The level of column aerosol extinction is documented in the Paris region, using routine ground-based remote sensing measurements made at SIRTa and at several AERONET sites. The various measurements are compiled to define the aerosol regime in the Paris region during winter. Spectral aerosol optical thickness (AOT) is measured by the CIMEL CE318-2 sun/sky-radiometer in the AERONET stations of Palaiseau and Paris during the 2004-2005 winter season, and in three AERONET stations with Fontainebleau (30 km South Paris) in the 2006-2007 winter season. Vertical profile of the aerosol extinction is sounded by a 2-wavelength prototype backscatter lidar located in Palaiseau, since 2002. Downwelling solar flux is measured at the BSRN station of Palaiseau by a CM22 Kipp & Zonen pyranometer since 2003. Pristine conditions in Palaiseau, defined by daily averaged values of AOT at 440 nm (AOT₄₄₀) smaller than 0.14 and AOT₈₇₀ < 0.07, occur 17 times from October 2004 to April 2005, with a minimum of 0.05 at 440 nm and of 0.03 at 870 nm. The variability in magnitude of AOT is important, as AOT₄₄₀ is larger than 0.3 in 10

cases. AOT440 can reach 0.7 because of urban pollution.