



Case study of extreme aerosol pollution events in the Paris area by synergy between optical measurements from multiple platforms

Julien Totems (1), Patrick Chazette (1), and Philippe Royer (2)

(1) CEA LSCE, Gif sur Yvette, France (julien.totems@lsce.ipsl.fr), (2) Now at LEOSPHERE, 76 rue de Monceau, 75008 Paris, France

Major pollution events encountered in the Paris area are mainly due to anticyclonic conditions where air masses are blocked and recycled (horizontal wind speed less than 1 m.s⁻¹) or advected from northeastern Europe. Such events with aerosol optical thickness larger than 0.4 at 355 nm have been documented by in situ sensors (AirParif network), ground-based sunphotometers (Aeronet network) and fixed and mobile ground-based Rayleigh-Mie lidars. The first studied event occurred during the MEGAPOLI (Megacities: Emissions, urban, regional and Global Atmospheric POLLution and climate effects, and Integrated tools for assessment and mitigation) summer experiment, on July 1st, 2009. Another favorable period for major pollution events is the spring season and we have highlighted two of them using the opportunity given by lidar experimental tests at LSCE in march 2011. Ground-based observations have been complemented by spaceborne measurements from MODIS and CALIPSO/CALIOP that give information on the spatial extent of the pollution plume in 3 dimensions. From this instrumental synergy we determine the aerosol optical properties (extinction coefficients in the atmospheric column, optical thickness, lidar ratio, ...). The probable aerosol sources have also been investigated using back-trajectories analyses computed by the HYSPLIT model (<http://ready.arl.noaa.gov/HYSPLIT.php>) ; they lie in the French Lorraine, Benelux, and German Saarland and Ruhr industrialized regions.