



Lidar-derived PM10 concentrations and comparison with regional modelling in the frame of MEGAPOLI

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The aerosol mass concentration has been retrieved from ground-based mobile lidar in the frame of MEGAPOLI (Megacities: Emissions, urban, regional and Global Atmospheric POLLution and climate effects, and Integrated tools for assessment and mitigation) European program. We present here the results of the summer campaign that was carried out in July 2009 around Paris area. During this campaign, the main objectives of the lidar were to determine aerosol and atmospheric structures (planetary boundary layer height, cloud and atmospheric structures) and the evolution of the aerosol optical properties (aerosol extinction coefficient and depolarization ratio) during its transport from the center of Paris to the remote suburbs (100 km from Paris). This eye-safe lidar is based on a Nd:YAG laser at 355 nm and has a spatial resolution of 1.5 m along the line of sight leading to a high spatial resolution on the retrieval of structures in the PBL. Ten intensive observation periods (IOP) have been performed with the mobile lidar. Aerosol mass concentration (PM10) profiles have been retrieved using optical-to-mass relationships previously established with in situ measurements performed around Paris. The mean lidar-derived PM10 concentration (and its variability) observed for the 10 IOPs is 22.4 ± 5.2 $\mu\text{g}\cdot\text{m}^{-3}$. We will here describe the method and analyze in more details the results for the 1st, 16th and 26th July 2009, corresponding to contrasted levels of pollution and atmospheric conditions. Lidar-derived PM10 concentrations will be compared and discussed with simulations from POLYPHEMUS and CHIMERE chemistry-transport models and ground-based observations from AIRPARIF network.