Lidar-derived PM10 in the London area

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A field campaign was conducted in London between 15 and 23 June 2009 in order to study the influence of emissions from within the London orbital motorway (M25) in terms of aerosol concentrations within the planetary boundary layer (PBL). The instrumental set-up involves a compact aerosol backscatter lidar developed by the CEA/LSCE and commercialized by LEOSPHERE Company. This eye-safe lidar, embarked in a small vehicle, has been working at the wavelength of 355 nm. Thanks to the excellent manoeuvrability of the van, we followed the aerosol distribution over the London ring by circling the M25. Using specific extinction cross-sections retrieved for urban aerosols, we derived mass concentration profiles from mobile lidar measurements with a high vertical resolution (30 m). This work presents the spatiotemporal variability of aerosol concentrations in the London area and investigates the agreement between those lidar-derived mass concentrtions and PM10 observatins obtained on London air quality network monitoring sites. This suggests a better consideration of aerosol vertical profiles in air quality models taking into account the transfer function between the surface emission and the mixed layer.