



Measurement of aerosol composition and fluxes in two urban areas.

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The aim of CityFlux is to directly measure emission fluxes of aerosol, segregated by size, from downtown urban areas on $\sim 100 - 1000$ m scale. Deployment of an Aerosol Mass Spectrometer (Aerodyne AMS) and a Time of Flight Aerosol Mass Spectrometer have provided detailed fast response measurements a function of particle composition. Supplementary measurements have been made of aerosol and trace fluxes and concentrations close to urban sources, in particular traffic in downtown street canyons..

Data analysed to date show that the organic aerosol mass fraction component dominates the volatile PM1 fraction. The aerosol mass spectral fingerprint principal component analysis shows that the organic component is dominated by Hydrocarbon-like organic aerosol (HOA). Correlation of the HOA fraction with CO, NO_x and black carbon shows clearly that this fraction is due to primary combustion sources with average diurnal trends peaking with traffic rush hours. Oxygenated organic aerosol (OOA) also forms a significant component of the organic PM1 fraction particularly in summer due to increased processing of HOA.

In addition, measurements in central show that a significant fraction of the PM10 exceedance can be driven by large levels of submicron nitrate aerosol which is formed insitu, and mostly at night. Seasonal ultrafine particle number fluxes determined by eddy covariance measurements in both cities conform to recent modelling work. Preliminary results from an AMS fitted with a Time Of Flight Mass Spectrometer (TOF-AMS) in central Manchester show the highest HOA fraction in PM2 ever observed in the UK.