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One year of urban background fluorescent aerosol measurements

Francis Pope
University of Birmingham, School of Geography, Earth and Environmental Sciences, Birmingham, United Kingdom (f.pope@bham.ac.uk)

Online aerosol fluorescence is a popular methodology for detecting bioaerosols in the atmosphere. In recent years there has been considerable effort into refining the technique to be able to distinguish between different bioaerosol classes such as pollen, spores and bacteria.

A near continuous record of aerosol fluorescence measurements has been recorded at an urban background observation site in Birmingham, UK for the year 2015. Fluorescence measurements were performed using the Biral aerosol fluorescence spectrometer (AFS) which measures both UV and visible fluorescence resulting from the excitation of aerosol particles at 280 nm. Speciation of the fluorescent particles into different bioaerosol class is possible with the AFS but the lack of particle sizing makes the task difficult compared to other techniques.

In addition to the fluorescence measurements, further campaign mode measurements were also generated for size segregated total particle numbers, ozone, nitrogen oxides and other chemical species. These measurements allow for the influence of road traffic on the concentration of fluorescent particle to be determined.

This presentation will provide an in depth look into how bioaerosol concentrations and speciation (pollen, spores and bacteria) change throughout the year. These changes will be linked to local and regional meteorology and climate. In particular, the consequences of the unusually warm UK winter upon bioaerosol concentrations will be highlighted.