



## **Characterisation of Black Carbon (BC) mixing state and flux in Beijing using single particle measurements.**

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BC is generated by the incomplete combustion of carbonaceous fuels and it is an important component of fine  $PM_{2.5}$ . In the atmosphere BC particles have a complex structure and its mixing state has crucial impact on optical properties. Quantifying the sources and emissions of black carbon in urban environments is important and presently uncertain, particularly in megacities undergoing rapid growth and change in emissions. During the winter of 2016 (10<sup>th</sup> Nov-10<sup>th</sup> Dec) the BC was characterised as part of a large joint UK-China field experiment in Beijing. This paper focuses on understanding the mixing state of BC as well as identification and quantification of BC sources. We used a combination of a Centrifugal Particle Mass Analyser (CPMA) and a Single Particle Soot Photometer (SP2) to uniquely quantify the morphology independent mass of single refractory BC particles and their coating content. The CPMA allows us to select pre-charged aerosol particles according to their mass to charge ratio and the SP2 provides information on the mass of refractory BC through a laser-induced incandescence method. Furthermore, another SP2 was used to measure the BC flux at 100m height using the Eddy Covariance method. We have successfully gathered 4 weeks of continuous measurements which include several severe pollution events in Beijing. Here we present preliminary results, characterising the distribution of coating mass on BC particles in Beijing and linking this to the main sources of BC in the city. We will provide initial estimates of the BC flux over a several kilometre footprint. Such analysis will provide important information for the further investigation of source distribution, emission, lifetime and optical properties of BC under complex environments in Beijing.