High density air quality network at Cambridge and London Heathrow Airport: first results and interpretations

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We have shown in previous studies the utility of low-cost electrochemical sensors in monitoring air quality pollutants including CO, NO and NO_2 in an urban environment. Such low cost sensors for gas phase species and others for particulates are now increasingly becoming available for inclusion in low cost air quality monitoring networks.

In this paper we show results from two network deployments, one involving CO, NO and NO_2 and temperature in a 46 node network around Cambridge and a second, including additionally O_3, SO_2, VOCs, CO_2 as well as size-speciated particulates (0.38 to 17.4 µm) and relative humidity, wind speed and direction which is currently deployed (40 nodes) around Heathrow airport.

For the Cambridge deployment we show how the use of a network permits discrimination between near-field and far field emissions, and compare network results with calculations from physical (ADMS) and statistical (land use regression) models.

We also present some early results from the LHR deployment which reveal many features of the emission characteristics of a major airport, showing source attribution associated with different operational modes, landside and airside activities, and regional pollution episodes influenced by macro meteorology.