

REPARTEE-I and REPARTEE-II (Regent's Park and Tower Environmental Experiment)

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This project brought together NCAS (National Centre for Atmospheric Science) scientists to study atmospheric chemical processes, and particularly those affecting atmospheric aerosol, in London by using the following sampling platforms:

- the BT tower at an elevation of 170 metres above ground level.
- adjacent Regents Park where ground level measurements were made.
- Marylebone Road at roadside in the street canyon.

Two air sampling campaigns were carried out throughout the months of October 2006 and October/November 2007. The objectives of the two campaigns were:

1. To understand the fate of traffic-generated nano-particles in the urban atmosphere
2. To determine fluxes of trace gases and particles above central London
3. To use the vertical and horizontal separation of sampling sites to study the evolution of chemical composition and physical properties of particles
4. To study the chemical properties and formation mechanisms of major components of airborne particles (especially nitrogen-containing)

A wide range of measurements were taken including:

REPARTEE I (2006)

- Particle and gas fluxes were measured at the elevated site (AMS, CPC, GRAEGOR, O₃, SO₂, NO_x, CO, CO₂)
- Real time chemical composition of aerosol by particle mass spectrometry at the park (AMS, ATOFMS).

- 24-hours size resolved PM chemical composition with MOUDI and Partisol at the park and at the tower.
- Size distribution of particulate matter with SMPS and APS in order to describe the evolution of the traffic component vertically and horizontally at the 3 sites.
- Fluorocarbon tracer sampler release from the park

REPARTEE II (2007)

The REPARTEE I results added some more objectives, addressed with additional instrumentation deployed during the REPARTEE II:

- LIDAR, deployed near the road site in order to describe the atmospheric boundary-layer (ABL) structure.
- NO₃/N₂O₅ CEAS system at the tower in order to elucidate the nitrate chemistry.
- Nano-SMPS at the tower in order to monitor the fate of the nano particles.

An overview of the 3 monitoring sites, including instrumentation used, method of aerosol sampling will be presented together with an overview of results.

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