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Investigation of vertical dispersion in urban areas using perfluorocarbon tracers: results from three campaigns

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The interest of studying vertical dispersion using perfluorocarbon tracers has increased in recent years. Main aims of the experimental campaigns have been to evaluate dispersion of trace gases in the urban environment and to improve air quality models.

There is almost no data published so far regarding vertical dispersion in an urban area using tracer technology. Here we present data from three campaigns made in 2006-2007. In total 16 perfluorocarbon tracer experiments were made. 14 of these were conducted in central London, UK as a part of the REPARTEE campaign. Releases were made 450, 1000 and 1300 metres away from the tower and sampling was made at three different heights at BT Telecom Tower (ground level, 150 metres and 190 metres above ground). Two tracer experiments were also conducted in central Manchester as a part of the Citiflux campaign. The releases were made 300 and 600 metres away from the tower and sampling was made on ground level and on top of Portland Tower which is 80 metres high. The samples were analysed using ADS-GC-MS run in negative ion chemical ionization mode. ADS is an abbreviation for absorption desorption system. The results show that considerable amounts of the tracer reached the elevated sampling positions compared to the ground level sites.