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## London Carbon Emission Experiment

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Carbon emissions related to fossil-fuel use are particularly localized, with urban areas being the dominant contributor responsible for more than 70% of global emissions. In the future, the share of the urban population is expected to continue to rise, leading to further increased focusing of fossil-fuel related emissions in urban areas. Cities are also the focal point of many political decisions on mitigating and stabilization of emissions, often setting more ambitious targets than national governments (e.g. C40 cities). For example, the Mayor of London has set the ambitious target for London to be a zero-carbon city by 2050. If we want to devise robust, well-informed climate change mitigation policies, we need a much better understanding of the carbon budget for cities and the nature of the diverse emission sources underpinned by new approaches that allow verifying and optimizing city carbon emissions and their trends.

New satellite observations of CO<sub>2</sub> from missions such as OCO-3, MicroCarb and CO2M, especially when used in conjunction with ground-based sensors networks provide a powerful novel capability for evaluating and eventually improving existing CO<sub>2</sub> emission inventories. We will set up a measurement network up-and downwind of London using portable greenhouse gas (CO<sub>2</sub>, CH<sub>4</sub>, CO) column sensors (Bruker EM27/SUN) together with UV/VIS DOAS spectrometers (NO<sub>2</sub>), which will be operated for extended time periods thanks to automatization of the sensors. The data acquired from the network will not only allow us to critically assess the quality of satellite observations over urban environments, but also to derive data-driven emission estimates using a measurement-modelling framework. In this presentation we will discuss the setup of the experiment, give a description of the sensors, and show some first observations obtained with the sensors.