CAMELOT: CO_2 And Methane Emission via Lidar and Other Techniques

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The project focusses on flux estimation using inverse modelling of greenhouse gases, principally carbon dioxide and methane. The abundance of these climate-relevant gases in the atmosphere has been increasing rapidly, leading to anthropogenic climate change. Any effort to understand how the earth system is responding to a changing climate and to monitor our attempts to reduce emissions requires a capacity to monitor these fluxes. Atmospheric inverse modelling is a technique that uses measurements of the distribution of trace gases in the atmosphere together with a transport model and a prior estimate of the surface fluxes and their uncertainty to estimate what the fluxes actual are. The work in this project addresses this problem on a variety of scales, from the facility scale, looking at single plumes from power plants measured on the scale of meters, through to global inverse modelling. The work focuses on the use of remote sensing measurements, particularly focusing on developments relevant for the planned missions CO2M, CO2Image, and MERLIN.