

Monitoring of Greenhouse Gases with in situ FTIR in East Anglia, UK, as part of a regional sampling network

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The main greenhouse gases (GHG) emitted by human activities in the UK are carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O). Understanding and quantifying their emissions is essential to monitor and guide emission reduction measures. The GAUGE (Greenhouse gAs UK and Global Emissions) project funded by the UK Natural Environment Research Council (NERC) aims to improve the knowledge of the UK GHG budget by an extensive measurement program.

As part of the GAUGE project, a regional sampling network in East Anglia had been established, focusing on emissions from agriculture as a main source of GHG by encircling a large area to capture the in and out flow of this area. We deployed an in situ FTIR analyser (Spectronus by Ecotech) for simultaneous measurements of CO₂, CH₄, N₂O and CO in Glatton, the most western station of the East Anglia sampling network, between October 2014 and April 2016. Air was sampled continuously from a church tower and measured on a minute time scale. The site is mainly influenced by south westerly winds. A clear diurnal cycle is observed in summer for CO₂, CH₄ and N₂O, which is less pronounced in the winter months.

In this presentation, we show first results from the measurements of CO₂, CH₄, N₂O and CO and describe the applied calibration and correction procedures. Monthly measurements of two primary standards, calibrated in reference to the WMO scale, and daily drift gas measurements were conducted to improve accuracy and monitor drifts in the instrument, respectively. Results from a cylinder intercomparison program (ICP) are shown as well.