



Investigating uptake of N₂O in agricultural soils using a high-precision dynamic chamber method

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Uptake (or negative flux) of nitrous oxide (N₂O) in agricultural soils is a controversial issue which has proved difficult to investigate in the past due to constraints such as instrumental precision and methodological uncertainties. Using a recently developed high-precision quantum cascade laser gas analyser combined with a closed dynamic chamber, a well-defined detection limit of 4 μgN₂O-Nm⁻²h⁻¹ could be achieved for individual soil flux measurements. 1220 measurements of N₂O flux were made from a variety of UK soils using this method, of which 115 indicated uptake by the soil. Only four of these apparently negative fluxes were greater than the detection limit of the method, which suggests that the vast majority of reported negative fluxes from such measurements are actually due to instrument noise. As such, we suggest that the bulk of negative N₂O fluxes reported for agricultural fields are most likely due to limits in detection of a particular flux measurement methodology and not a result of microbiological activity consuming atmospheric N₂O.