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# Utilization of CRDS method in reactive trace gas emission estimation in agricultural experiments – preliminary results

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Nowadays it is highly recommended to quantify reactive trace-gases such as N2O or NH3 emitted by agriculture, particularly as a result of fertilization and manure application, due to their environmental effects.
In this study we present a brief summary on the performance of the used PICARRO G2508 analyzer, and retrieved preliminary data on soil N2O and NH3 emission in laboratory soil column experiments. The measurements were carried out in a non-steady state flow through setup, where concentrations were logged approx. in every 1s. Data suggests that high dose of fertilizer significantly increases the N2O emission. This phenomenon become less evident with the decrease of fertilizer quantity, although using lower field dosage (80 kg/ha N) still leads to detectable N2O emission increase. The N2O emission peaks 1-2 days after fertilizer application and the trend is decreasing for 3-4 days to the initial values. N2O emissions are extremely moisture dependent.
In case of NH3 emissions mineral fertilizer has a significant effect as well. Similarly to N2O findings, soil moisture has a key role in NH3 emission (irrigated soil showed 1-2 times higher final concentrations than dry samples).
Our future field experiment on N2O soil flux measured by CRDS method is intended to set up at two arable fields, where different tillage systems (1) and mineral fertilizer management with different dosages (2) are applied. Another experiment of us investigates the effect of pig manure application on soil NH3 emission in soil column experiment (3).
The field measurements should be supplemented by laboratory experiments beforehand like our results presented here, to find out the governing factors in a simpler system.