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*Supplement of*

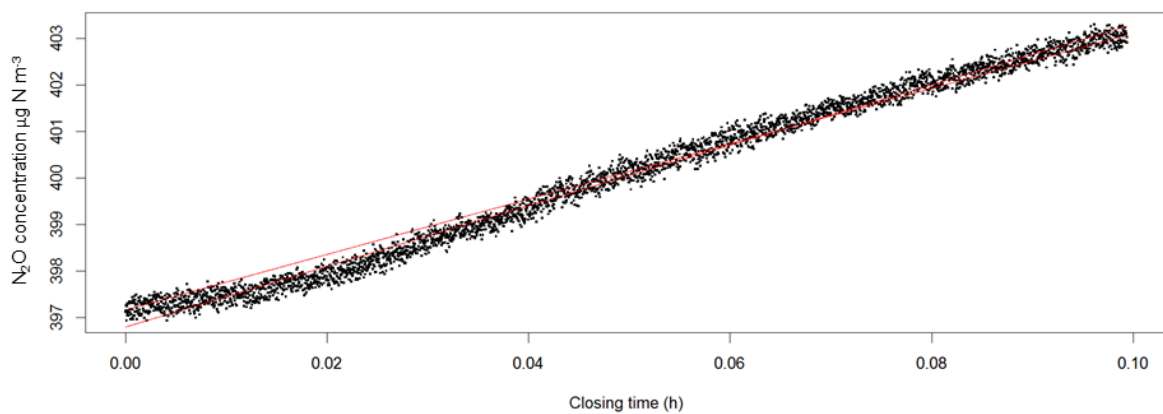
## **Gas chromatography vs. quantum cascade laser-based N<sub>2</sub>O flux measurements using a novel chamber design**

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In ~5 % of the observations using the QCL setup, a somewhat irregular pattern as shown in the figure below was observed. It only happened right after setting the chamber onto the soil collar so maybe it was caused pressure fluctuations. We could not identify any correlations to either environmental or internal system conditions when this pattern was found. We therefore think it is a reasonable security procedure to remove the first two minutes (because it never exceeded this initial period) of data from a chamber cycle to ensure natural steady state soil efflux.



**Fig. S1:** Example of N<sub>2</sub>O concentrations right after chamber closure up to 0.1 h (=6 minutes). Note the small dent at the beginning up to 0.03 h (=108 seconds).