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## Combining three different methodologies to quantify N<sub>2</sub>O emissions at the landscape scale on the OS<sup>2</sup> INGOS site (Central France)

Jordan Bureau <sup>a</sup>, Agnès Grossel <sup>a</sup>, Benjamin Loubet <sup>b</sup>, Patricia Laville <sup>b</sup>, Raia Massad <sup>b</sup>, Edwin Haas <sup>c</sup>, Klaus Butterbach-Bahl <sup>c</sup>, and Catherine Hénault <sup>a</sup>

<sup>a</sup> INRA, UR 0272 Science du sol, Centre de recherche d'Orléans, CS 40001 Ardon, 45075 Orléans cedex (France)

<sup>b</sup> INRA, UMREcoSys, F- 78850 Thiverval-Grignon (France).

<sup>c</sup> IMK-FSU, KIT Garmisch Partenkirchen (Germany)

Although performances of N<sub>2</sub>O gas analyzers are now very high, a confident estimation of N<sub>2</sub>O fluxes emitted locally by the soil remains a challenge because of the very high spatial and temporal variability whatever the investigated scale. The aim of this study is to associate different techniques of N<sub>2</sub>O fluxes measurements at the landscape scale. Specific information obtained by each technique will be combined to each other in order (i) to study temporal and spatial variability (ii) to identify local and temporary sources of these emissions (iii) to compare N<sub>2</sub>O values obtained by each system.

The measurement campaign took place during two months from mid-March to mid-May 2015 in a small agricultural region in Central France (INGOS site OS<sup>2</sup>).

The experimental device included:

- (1) an Eddy covariance (EC) measurements system with a 15 m high mast to cover a 3 km<sup>2</sup> area, with a closed-path QCL spectrometer (Aerodyne Research Inc.) measuring N<sub>2</sub>O, H<sub>2</sub>O and CH<sub>4</sub> at 7.9 μm
- (2) 8 automated chambers in line with a mobile gas chromatograph allowing continuous measurements on a 100 m<sup>2</sup> area
- (3) a fast box system in line with a laboratory-built QCL spectrometer (Guimbaud et al., 2011) weekly used on different sites in the footprint of the eddy covariance measurements.

Climatic conditions and soil parameters were recorded during this campaign. First results reveal N<sub>2</sub>O fluxes comprised between 0 and a local peak value of 164 g N-N<sub>2</sub>O.ha<sup>-1</sup>.d<sup>-1</sup>. Further data analysis is ongoing.

