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### ► To cite this version:

Agnès Grossel, Jordan Bureau, Benjamin Loubet, Patricia Laville, Raia Silvia Massad, et al.. Evaluation of new flux attribution methods for mapping N<sub>2</sub>O emissions at the landscape scale from EC measurements. EGU 2017, European Geophysical Union General Assembly 2017, Apr 2017, Vienne, Austria. , Geophysical Research Abstracts, 19, 2017, Geophysical Research Abstracts. hal-01604187

**HAL Id: hal-01604187**

**<https://hal.science/hal-01604187v1>**

Submitted on 2 Jun 2020

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## **Evaluation of new flux attribution methods for mapping N<sub>2</sub>O emissions at the landscape scale from EC measurements**

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The objective of this study was to develop and evaluate an attribution method based on a combination of Eddy Covariance (EC) and chamber measurements to map N<sub>2</sub>O emissions over a 3-km<sup>2</sup> area of croplands and forests in France. During 2 months of spring 2015, N<sub>2</sub>O fluxes were measured (i) by EC at 15 m height and (ii) punctually with a mobile chamber at 16 places within 1-km of EC mast. The attribution method was based on coupling the EC measurements, information on footprints (Loubet et al., 2010<sup>1</sup>) and emission ratios based on crops and fertilizations, calculated based on chamber measurements. The results were evaluated against an independent flux dataset measured by automatic chambers in a wheat field within the area. At the landscape scale, the method estimated a total emission of 114-271 kg N-N<sub>2</sub>O during the campaign. This new approach allowed estimating continuously N<sub>2</sub>O emission and better accounting for the spatial variability of N<sub>2</sub>O emission at the landscape scale.

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<sup>1</sup>Loubet, B., Genermont, S., Ferrara, R., Bedos, G., Decuq, G., Personne, E., Fanucci, O., Durand, B., Rana, G., Cellier, P., 2010. An inverse model to estimate ammonia emissions from fields. *European Journal of Soil Science* 61, 793-805.