



Evaluation of new flux attribution methods for mapping N₂O 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 N₂O emissions over a 3-km² area of croplands and forests in France. During 2 months of spring 2015, N₂O 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., 2010¹) 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-N₂O during the campaign. This new approach allowed estimating continuously N₂O emission and better accounting for the spatial variability of N₂O emission at the landscape scale.

¹Loubet, 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.