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N2O fluxes measurements over a maize crop combining chamber and micrometeorological systems during the NitroCosmes Campaign

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Agriculture is responsible for 13.5% of the greenhouse gases emissions at the global scale. It is a potent emitter of nitrous oxide (N2O) through nitrogen supplies into the soil by fertilizers, manure and other soil-enriching agents. However, the magnitude of these emissions is still highly uncertain due to their high spatial and temporal variability [1]. So, N2O flux monitoring is essential to detect seasonal peaks in production and to better quantify these emissions from local to global scale.
From May to September 2012, the NitroCosmes campaign involving CESBIO, GSMA, CNRM-GAME and Laboratoire d'Aérologie was held in southwestern France, at Lamasquère, an ICOS-level1 experimental site [2]. A full set-up including manual and automatic soil chambers, an Eddy Correlation (EC) tower (named Ecoflux), and a Relaxed Eddy Accumulation (REA) system was deployed to measure N2O fluxes above a maize field. The EC Ecoflux Station [3] and the REA system were both relying on an innovative and accurate Quantum Cascade Laser sensor (QCL), developed at GSMA. The results for EC measurements are encouraging since they show good agreement with the different chamber measurements. Moreover, peaks of emissions were observed after rain events or addition of fertilizer.

References should be listed as below
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[3] Mappe et al., 2013, Review of scientific Instruments, 84, DOI:10.1063/1.4790376.