



## **Energy budget components, ammonia concentration and flux measurements on an agricultural landscape near Bjerringbro, Denmark**

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As a part of the NitroEurope common field experiment, energy budget components and ammonia concentrations were measured by various methods on an agricultural field near Bjerringbro, Denmark in April 2009. Several sources of ammonia (pig farms, nearby fertilized fields) were present in the landscape and the field itself was also fertilized with pig slurry during the campaign.

Turbulent fluxes were calculated using micrometeorological measurement data (standard meteorological parameters, radiation and surface energy budget components) as well as three different methods: (i) the gradient, (ii) the Bowen ratio and (iii) the eddy covariance method using 15 min average time. Results obtained using different methodologies for flux calculations and local effects on energy budget closure were compared.

Instrumentation used for measuring ammonia concentrations included two wet-chemical (AMANDA) instruments and two photoacoustic instruments (a mid-IR CO<sub>2</sub> laser based Nitolux and a self-developed near-IR diode laser based WaSul instrument). The WaSul instrument was operated in gradient configuration, which also enables the calculation of ammonia fluxes. The instruments were placed at different points of the field to gain more information on the spatial concentration distribution.

Ammonia concentration data measured by the different instruments and wind speed and direction data were used to estimate the location of ammonia sources within the landscape. After fertilization of the field ammonia emission fluxes were calculated from the gradient data.