



INDAAF
IGAC/DEBITS/AFrica

Surface atmosphere exchange of NO and CO₂ in a grazed semi-arid ecosystem: comparison of measurements and model predictions

Claire Delon, Corinne Galy-Lacaux, Dominique Serça, Ndiobo Camara, Eric Gardrat, Idrissa Saneh, Rasmus Fensholt, Torbern Tagesson, Valérie Le Dantec, Bienvenu Sambou, Cheikh Diop, Manuela Grippa, Eric Mougin

This research is a collaborative work between Laboratoire d'Aérodynamique (Toulouse, **France**), Géosciences Environnement Toulouse (France), Centre d'Etudes Spatiales de la BIOsphère (Toulouse, France), Institut des Sciences de l'Environnement, Université Cheikh Anta Diop (Dakar **Senegal**), Institut Sénégalais de Recherche Agronomique (Dakar, Senegal), Centre de Recherche Zootechnique (Dahra, Senegal) and Institut Géographique de l'Université de Copenhague (**Denmark**).

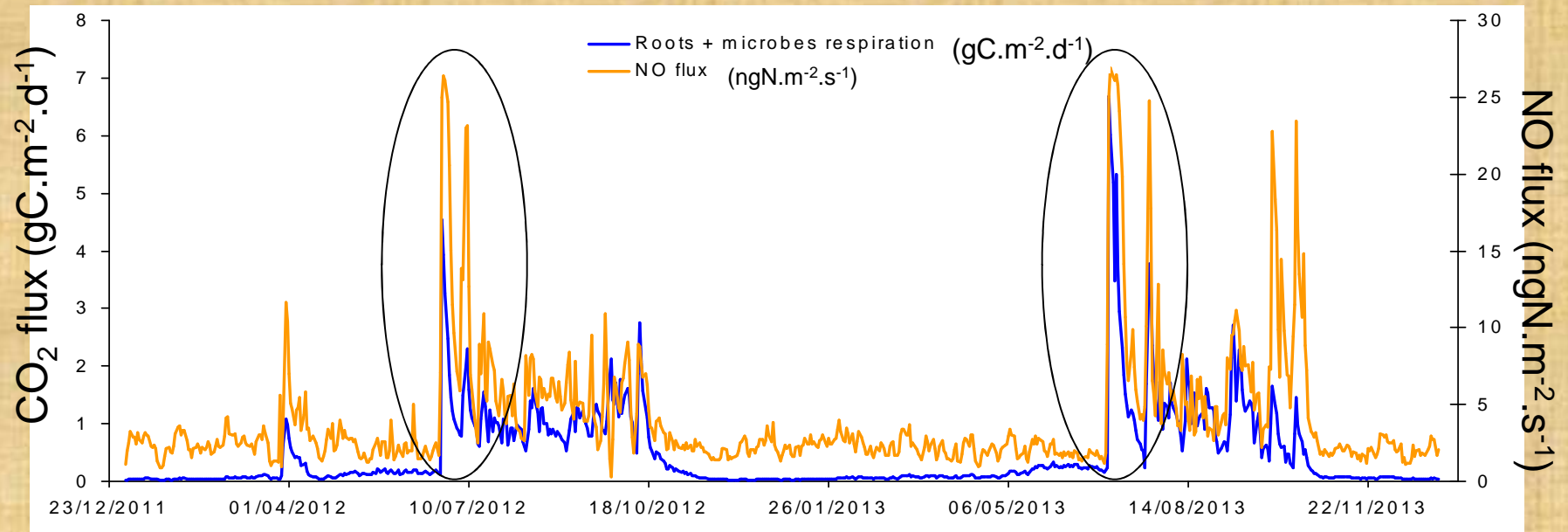
Context and objectives

- N&C biogeochemical cycles between surface and atmosphere in a semi-arid ecosystem.
- Study located in a grazed semi-arid savanna in Dahra (Sahel, Senegal)
- Necessary to quantify emissions because they participate to the global release of N and C compounds.
- Soil NO & CO₂ fluxes to the atmosphere in water limited conditions and underlying processes.
- Modeling work (2012-2013) and measurements (3 field campaigns at transition dry/wet & wet/dry seasons)



Dahra in November 2013

NO and CO₂ emissions from soils



- Important emissions occur at the beginning of the wet season due to microbial processes reactivated in the soil when moisture conditions are favourable, leading to the decomposition of the organic matter.
- Fluxes of NO and CO₂ are correlated, and driven by soil moisture.
- Mineralization, nitrification and respiration are linked by the same microbial processes.