Vorschlag für ein Follow-up Proposal

Einsatz von Feldrobotern zur Erfassung der räumlichen Heterogenität von THG Flüssen

→ Zeitliche Variabilität durch kontinuierliche EC-Messungen und automatische Kammermessungen mit QCL-Einsatz gut abgedeckt

→ Erfassung der räumlichen Variabilität durch die (meist geringe) Anzahl der Kammern extrem limitiert

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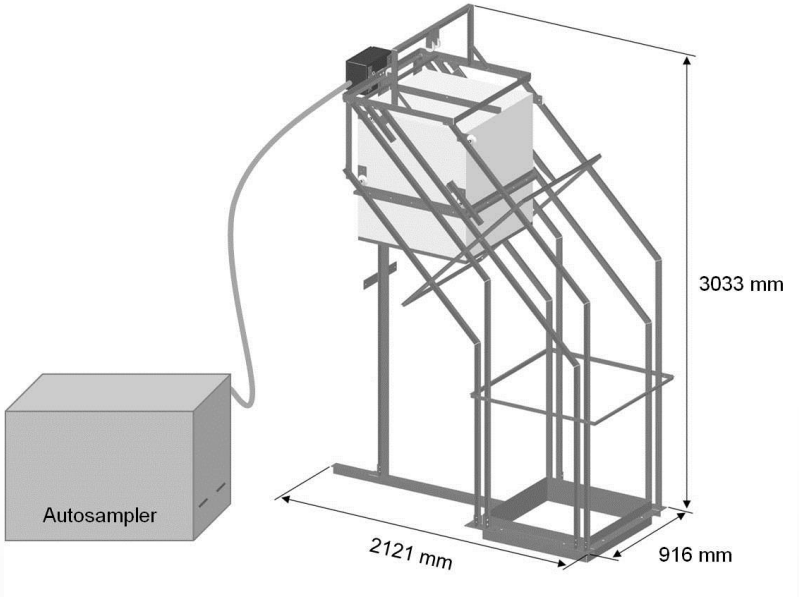
Beispiel für ein (stationäres) Kammersystem



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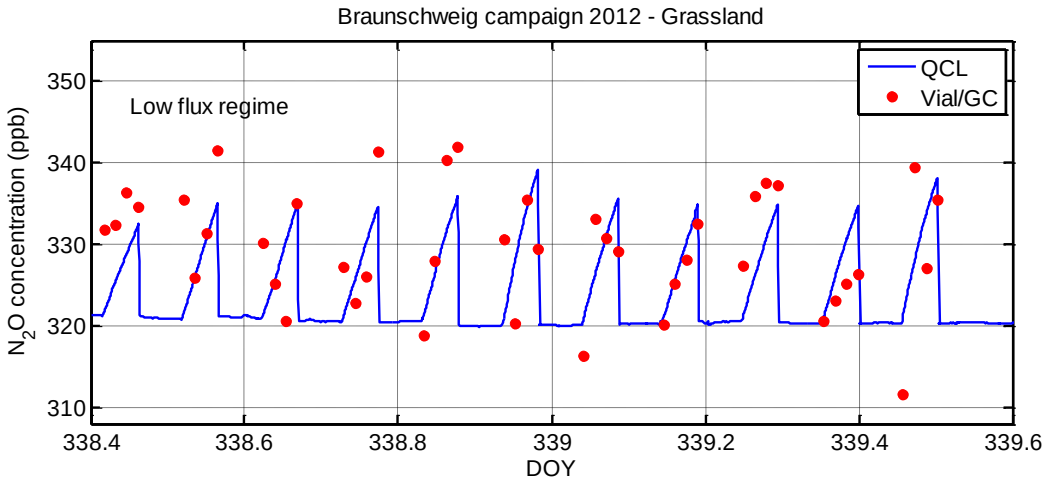
GC vs. QCL chamber measurements of N_2O

Low flux regime



High flux regime

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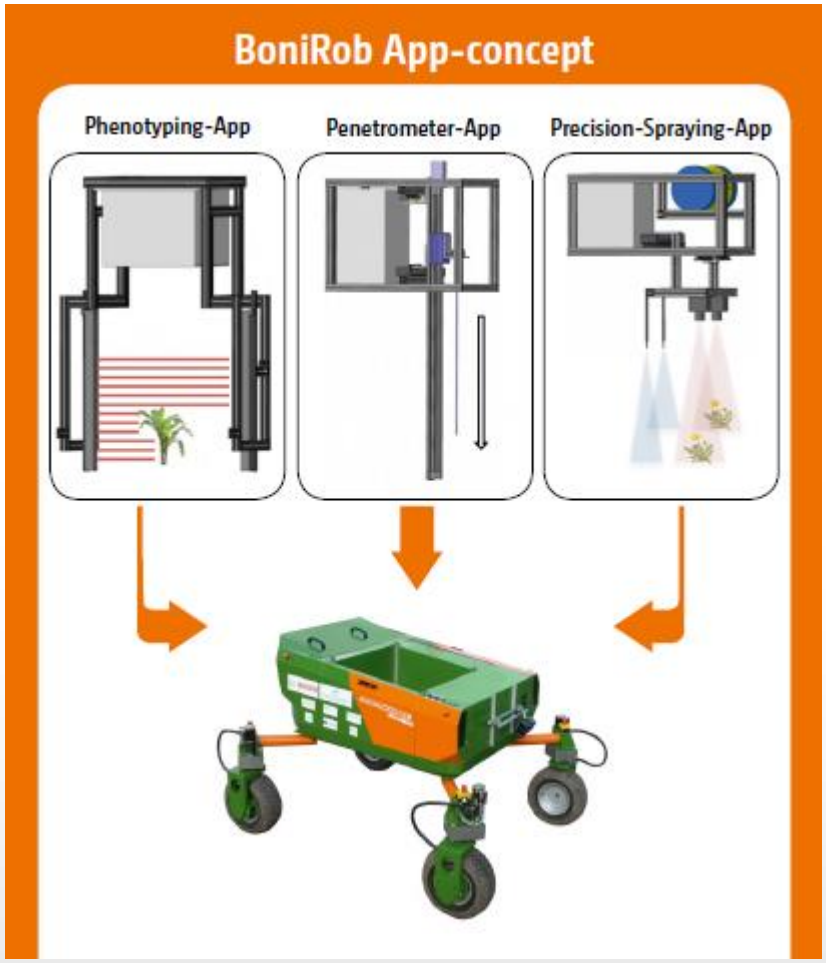
Feldroboter

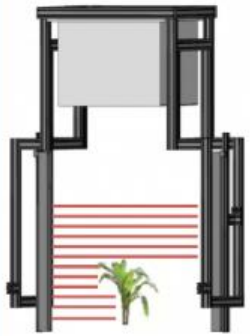
→ Basisplattformen existieren

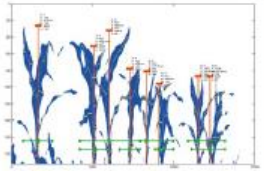
- FH Osnabrück/iotec
- NMBU, Universität Ås, Norwegen



Beispiele für bereits existierende Anwendungen

Phenotyping-App

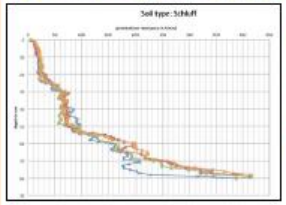




This app consists of a special high-resolution, imaging light curtain, a triangulation sensor and a digital camera. The data from these sensors can be used for interpretation of morphological traits.
The figure „ light curtain measurement data", represents the data of the light curtain as silhouettes of plants.

Supported by

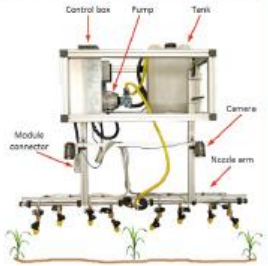
Penetrometer-App



This App integrates a mechanical actuator into BoniRob. A penetrometer is included for soil property measurements down to depths of about 80 cm furthermore a soil moisture- and temperature Sensor is mounted. The amount and the positions of the measurement points can be defined prior to an automatic run, thereby using linear motors within the module and GPS. As compared to (typical) manual applications of a penetrometer, soil moisture and temperature, the automatic system shows constant characteristics and allows replications for a large number of measurements.

Supported by

Precision-Spraying-App



This App is a camera-based application module for selective weed control. By selected herbicides spraying, both ecological as economic advantages are achieved. The following figure shows the composition of the application module. All 75cm, a low-cost camera is mounted. With the help of image processing, Plants are detected and the according valves of the nozzle arm are opened.

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Mögliche Projektpartner und Inhalte

→ <u>FH Osnabrück/iotec u. NMBU, Uni Ås</u>

- Roboter der NMBU, Uni Ås als Basis
- Steuerungssoftware sowie Bodenfeuchte und Bodentemperaturmessungen durch FH Osnabrück/iotec

NMBU/Bioforsk/Adigo field flux robot

→ <u>Entwicklung von</u>:

- 2 Kammertypen (transparent/nicht transparent; mit und ohne Rahmen)
- Kühlsystem für transparente Kammern
- Temperaturregulierung für QCL-Box
- Anwendung auf Testfläche → Umzäunung
- Kontinuierliche Messungen auf „Schienen“/verfestigten Spuren

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