

Evaluation of chamber configurations for CH₄ and N₂O measurements

P.S. Kroon

A.P. Schrier (Wageningen Universiteit en Researchcentrum)

D.M.D. Hendriks (Vrije Universiteit Amsterdam)

A. Hensen

W.H. van 't Veen

W.C.M. van den Bulk

P.A.C. Jongejan

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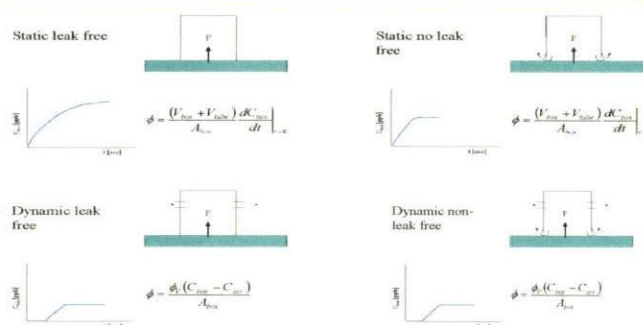
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Authors: P. Kroon, A. Schrier¹, D. Hendriks², A. Hensen, H. van 't Veen, P. van den Bulk & P. Jongejan

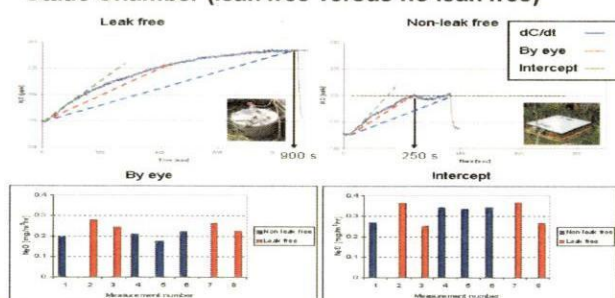
1. Wageningen University and Research Centre (WUR), Department of Nature Conservation and Plant Ecology
2. Vrije Universiteit Amsterdam (VUA), Department of Hydrology and Geo-environmental Sciences

Introduction

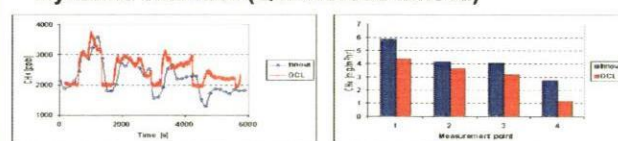
- Four chamber configurations are used in the National BSIK ME1 project; Static leak free, static non-leak free, dynamic leak free and dynamic non-leak free. Accuracy, location flexibility, required sampling frequency and calculation regime were evaluated using two field campaigns on a farm site in Oukoop in September 2006.
- A quality control for chamber measurements was done using a C₂H₆-tracer in automatic box measurements in Cabauw in 2006.



Static Chamber (leak free versus no leak free)



Dynamic chamber (QCL versus Innova)

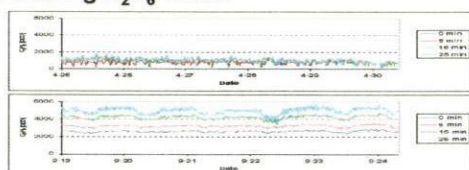


- Approximately same concentration behaviour
- Dynamic chamber is inaccurate due to ϕ_v and ΔC
- Drift effects Innova

$$\phi = \frac{\phi_v (C_{box} - C_{air})}{A_{box}}$$

Quality control using C₂H₆ tracer

Bad quality



Good quality

- Good quality indication for flux data

Conclusions

- No rings are required for accurate chamber measurements
- Intercept method is required for static chamber measurements
- Quality control is possible using C₂H₆ - tracer

Type	Accuracy	Sampling frequency	Location flexibility
Static leak free	++	< 2 min	-
Static non-leak free	+	< 15 s	++
Dynamic leak free	-	No restriction	-
Dynamic non-leak free	-	No restriction	++

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p.kroon@ecn.nl, tel: +31224-564308

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