



Dimensioning IRGA gas sampling system : laboratory and field experiments

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Both laboratory and field experiments were carried out in order to define suitable configuration ranges for the gas sampling systems (GSS) of infrared gas analyzers (IRGA) used in eddy covariance measurements.

In the laboratory, an original dynamic calibration bench was developed in order to test the frequency attenuation and pressure drop generated by filters. In the field, three IRGAs of the same type equipped with different filters or different rain caps were installed and run and the real frequency response of the complete set-up was tested.

The main results are that:

- Filters may have a strong impact on the pressure drop in the GSS and this impact increases with flow rate.
- On the contrary, no impact of the tested filters on cut off frequency was found, GSS with and without filters presenting similar cut off frequencies.
- The main limiting factor of cut off frequency in the field was found to be the rain cap design. In addition, the impact of this design on pressure drop was also found noteworthy.