

Atmos. Meas. Tech. Discuss., referee comment RC2
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Comment on amt-2021-82

Anonymous Referee #2

Referee comment on "An automated system for trace gas flux measurements from plant foliage and other plant compartments" by Lukas Kohl et al., Atmos. Meas. Tech. Discuss., <https://doi.org/10.5194/amt-2021-82-RC2>, 2021

General comments

Kohl and colleagues developed an automated plant chamber to measure trace gas and VOC fluxes from plant shoots. The system includes cooling elements, removal of transpiration water and an automated system to replace fixed CO₂. With this system it should be possible to relate trace gas exchange of plant shoots –related to leaf area- to environmental conditions and plant physiological patterns. In their manuscript they introduce the chamber technique itself and provide substantial results from initial tests and validation experiments.

In general, the manuscript is very well written and easy to follow. The design of the chamber is well thought out and will certainly improve the current technique to measure trace gas emissions from plants in the field. Also the test measurements appear to have been well carried out and the results are convincing. The section about measurement uncertainties including interferences with VOC is adequate. Although often discussed, only a couple of experiments take interferences with VOCs into account.

What about the leakage associated with the shoot entrance? Could this be a problem by causing different leakages when changing branches between measurements, thereby leading to different leakages?

Did you observe any artefacts due to pressure effects in the system?

Moreover, I've got a remark regarding plant physiology. Gas exchange depends on

stomatal conductance. Would it be possible to calculate stomatal conductance of leaves with the parameters given by your chamber system? If so, it might be possible to relate stomatal conductance to trace gas fluxes. It could be interesting to see how fluxes change depending on stomatal conductance/humidity/light etc.

The manuscript is of high quality and deserves publication in Atmospheric Measurement Techniques. Therefore, I recommend publication of this manuscript with minor revisions.

Minor comments

Fig 5+6 Please revise figure label (x and y scale + legend), the letters are too small or -in case of the legend- overlap.