

Interactive comment on “Eddy covariance for quantifying trace gas fluxes from soils” by W. Eugster and L. Merbold

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Reviewer #2 aims at the following points in his assessment:

1. Is there a need for a paper of this type? [...] From my perspective this is more of an editorial decision
2. I miss a bit more on the constrains. I would find it useful to have a quantitative evaluation of, where the technic is applicable, or in other words; under which conditions would you expect to obtain useful results?
3. Also e.g. uptake of CH₄ in soils is not very likely to be detectable by standard EC techniques and can in my opinion not necessarily be considered superior
C249

to chambers. Some quantification on how to determine sensitivity limits in this context I would consider useful information in a paper like the present one.

4. Also, I think it could be appropriate to clearly point out, that though EC measurements are continuous, variations in the measured variables may reflect heterogeneity in the measured surface or changes in the footprint, rather than temporal variations in the observed parameters.
5. Paragraph 2.2.2 : could a drawing be helpful to support the text here?
6. P552 L1-5: it is unclear to me what is meant here, consider rephrasing. P553L25-Some discussion of the problem of obtaining good quality data during night might be appropriate here.
7. Paragraph 4.2.1., Though fascinating, EC techniques does not strike me as the best choice for manipulation experiments, which is why I find this part a bit lengthy. You could consider to shorten it or focus more on land-use or management techniques.
8. P559L21: Do we need the considerations on aircrafts here?
9. P561L8-15: likewise, isotopic EC flux measurements are certainly not for newcomers.

As a response how we will be able to improve our manuscript or where we are of different opinion we think that:

1. There may have been some confusion about what a review actually should be. We will follow the suggestions by editorial board member J. Six and will sharpen the synthesizing component of the paper which has not been fully developed.

2. For us these feedbacks are very helpful. We tried hard not to offend the seasoned chamber flux scientists, but as we see from this and other comments, we were not really 100% successful in making clear that eddy covariance cannot replace chamber flux measurements. We will have to expand our text to better address the constraints and more clearly state when one could expect good results.
3. We agree, and we actually thought that we did not place a statement of EC being superior to chambers anywhere. Thus, we will carefully check the wording and further improve it to avoid potential misunderstandings.
4. Yes, we can certainly expand on this aspect.
5. We will add a drawing to support paragraph 2.2.2
6. Will be reworded and clarified
7. We will shorten this paragraph and focus more on land-use or management techniques
8. We would definitely want to keep the aircraft aspect in, since this is an interest of many.
9. Of course we agree that isotopic flux measurements are not for newcomers, hence we only mentioned this under "Future directions and challenges". We will however have to completely revise our synthesis aspect of the paper and at that point we will carefully take into consideration whether or not we should drop isotopic flux measurements.

Interactive comment on SOIL Discuss., 1, 541, 2014.