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Discussions

Interactive comment on "**Net ecosystem CO$_2$ exchange measurements by the closed chamber method and the eddy covariance technique and their dependence on atmospheric conditions – a case study**" *by* **M. Riederer et al.**

Anonymous Referee #2

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1 General comments:

The paper reports results from a 10 day field comparison of CO$_2$ fluxes measured by closed chambers and by eddy covariance. The main scope of the paper is to investigate the difference between the two types of measurement in relation to atmospheric conditions.

The authors take the eddy covariance measurements as a reference and find that the

chamber method overestimates the fluxes by 40%. The largest differences were found in the afternoon during times of oasis effect, and at night while stable stratification was present.

The paper provides interesting aspects of chamber flux measurements compared to eddy covariance measurements in relation to specific micrometeorological conditions and merits publication. It does not present much practical advice of how and when to use chambers for flux measurements. I also miss some more discussion about eddy covariance flux measurements as providing the "true" flux. The paper could increase its value for the scientifc community by providing a more detailed discussion on these aspects.

The paper could also benefit from a thorough language revision.

2 Specific comments:

Title: Why "a case study"? Most studies are case studies, so it is somewhat redundant.

p. 8786, l.22: Please explain the phrase "...especially when - ventilators are used ..."

p.8787, l.1: "alter the natural long wave radiation balance to zero"; I might guess what is meant by this, but I would prefer a more elaborated eplanation. Even chambers are not perfect insulators.

p.8787, l.14: Please add information about the slope of the grassland. This could affect the reliability of the eddy covariance flux measurements as a reference. I also miss some information about the diurnal course of meteorological parameters. When is the effective sunrise and sunset at the grassland? This affects the temperature and thus the interpretation of the results.

p.8787, l.21: The CO$_2$ analyzer used was the Li-7500. This open-path sensor is es-

pecially sensitive to rain and dew, and normally this leads to a filtering of a quite large fraction of the data. How was this handled in the present study? And how does it affect the comparison with the chambers?

p.8791, l.14: Is there any risk of biasing the overall difference between chambers and EC because of this filtering?

p.8792, l.7: The sentence "However, for the whole measurement period ..." could be deleted. The fact was already stated at the previous page.

p.8792, l.21 and Fig. 2b: I miss a precise definition of the oasis effect used for filtering. Could the oasis effect occur at all times of the day (cf. fig 2b)? And if so, why only a difference between the two systems during the late day?

p.8793, l.11-12: I do not see the meaning of the text in the brackets. If they are meant to define "high atmospheric ability", "low wind velocity", and "little outgoing wave radiation", resp., I miss some values of the parameters given.

p.8794, l.15: missing "to" in "able [to] represent".

p.8795, l.9: Do the so-called "coherent structures" represent true ecosystem fluxes, or are they a kind of error in EC measurements?

Fig, 1, 3 and 5: Most of the symbols are very difficult to see, at least in my print. Can the figures be improved in this respect?

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