**Biogeosciences
Discussions**

Interactive comment on "The effect of atmospheric turbulence and chamber deployment period on autochamber CO$_2$ and CH$_4$ flux measurements in an ombrotrophic peatland" *by* D. Y. F. Lai et al.

Anonymous Referee #2

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The manuscript describes the effects of air turbulence on gas fluxes measurements (CH4 and CO2) of an automatic closed dynamic chamber system in different contrasting sites in a peatland in Canada. Although this issue has been tackled in different papers, this is unique research with an impressive dataset and furthermore with an interesting discussion on how to solve under/overestimation gas fluxes values. This research is highly relevant as it looks at a big problem that soil scientist have in gas flux measurements and the reliability of these data. The information in this manuscript will be of great help for soil scientists to improve autochamber flux measurements analysis. The article is well written and structured (with the exception of the discussion) and includes latest references in the field. I would recommend publication after changes

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recommended as follows:

Abstract: Abstract well summarizes the main findings in the article.

Introduction: Introduction well summarizes current knowledge on gas flux measurements with autochamber system and give enough information to clearly understand the rest of the manuscript.

Methods. Well written and organized. 2.1 Site description Line 25, 1444 I would suggest, just for this paragraph, to add botanical authors initial to the plant names. 2.2 Autochamber system line 13, 1446. Solenoid valves, which kind? Line 0, 1447. "To estimate the effective volume of the chamber". Can u please specify more how and why you are doing this and why during those 2 hours at night. 2.3 CO2 concentration profile system Line 27, 1447. How sure are you about the reliability of those data as you cut out big blocks of peat? That site was very disturbed indeed. 2.4 Ancillary field measurements Line 13, 1448. I would very briefly define what the shear stress is. Line 19, 1448. Why did you install the anemometer at 3 m height? Wind turbulence at height might differ significantly near the ground. Please explain. Line 3, 1451 In fig 1 you show just the sedge site, did the others showed similar pattern? You did not include the others just for space reasons? How do they compare?

Discussion Although the content of the discussion section is well written, I would recommend a more organized structure. There are many discussion points and comparisons in the section: carbon dioxide, methane, different sites, high and low turbulence issues. I would then recommend using some subheadings. I had to read the section quite a few times, as there is a large amount of highly detailed information that I feel like subheadings might provide some helpful organization.

Conclusion I would avoid using references in this section; they should be just in the discussion.

Figures and tables presented are enough for a clear understanding. Figure 6. Legend

missing

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