



## ***Interactive comment on “Measurements of hydrocarbon emissions from a boreal fen using the REA technique” by S. Haapanala et al.***

### **Anonymous Referee #2**

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General comments : This paper presents the results of biogenic organic compounds and methane fluxes obtained using the Relaxed Eddy Accumulation system. The system is implemented above a boreal fen. The interest of this paper relies on an original dataset however we don't know to what degree the fluxes measured are reliable. In addition, the paper is not well written. It is too synthetic: there are a lot of ideas which follow one another but which are not enough developed and linked together. The measurements are not really validated (only with unpublished data or "parallel analysis") and it would be more convincing to see stronger arguments to ensure the accuracy of the measurements. Eventually, the analysis carried out from this original dataset is too short and fast. The authors should detail their work.

Specific comments : Introduction: I found that the beginning of the introduction is a bit muddle. There are a lot of ideas which are not related one another. Either the authors

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developed entirely their idea before addressing the other one, or the authors use more linking adverbs. p.1647-1648 : instead of only quoting other authors who performed the same kind of measurements, it would also be interesting to details the conditions and orders of magnitude they found for their measurements. p. 1648 : the presentation of the paper objectives is too fast : the authors should also describe the period of the year, the duration of the measurements.

Material and methods : p.1648 : what is the height of the measurements? p. 1649, line 7 : " Gaman et al. 2001 ". The year for the reference is different than that of p.1655. p.1649, line 16 : is the correction you mention included with the acquisition software or do you correct after having recorded the data? What does it consist in (there are many 3-D head correction)? Then a running mean filter is applied to the wind component. What is the effect of this filter to the system? Does it induce a delay for the selection system? What is the rate of rejected air during the selection period with a threshold of 0.5sw? How long does it take to drain out the bags into the canister. I don't understand why it is necessary to fill in the tedlar bags before the canisters? When does start the next cycle of selection? Is it an automatic system? I would like to see a schematic of the functioning for the whole system. The authors should detail a little more their system so that it gains more confidence and reliability. p. 1650, line 17: "... within one week of ..." : is it a constraint that measurements are analyzed quickly? Do the C2-C6 substances evolve rapidly? What are the constraints for these species? p.1651, 1st §, What is the accuracy of the instruments used? p.1651, last § : It's not clear to me how many measurements were performed per day. And why didn't you measure fluxes for longer periods. p. 1651 : why the measurements which were carried out on the 14th of April are not included in the data analysis? It does not worth to present them in this case.

Results and discussion : p.1651, line 19 : " ... Utö and Pallas" : Where are these places? You didn't mention them before. What is a parallel analysis in another place, to my opinion, it doesn't mean anything? Is it the same period? Is it the same dataset?

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This seems to be rather confused and do not tend to give confidence in the results and uncertainties. p. 1651, what is the interest to have the flux detection limit if we don't know the instrument sensitivity to the concentration measurements? p.1651, line 26: on fig. 3, you only show time series for one day. Why don't you want to show the whole period? You don't have long series of measurements so it would be more interesting to see the whole period. In addition, after that, you give the mean methane emission for the whole period so we would like to see how look the fluxes for this period. p. 1652, line 2 : I wouldn't compare these results with unpublished data without giving more details on how they were collected. This would appear more convincing to validate your measurements. p.1652, line 9 : " these fluxes are in the same ..." : again, in addition to quoting Janson and De serves (1998) and Janson et al. (1999), you could give the values they obtained for their measurements. p.1653 , line 9 : Can you give the correlation coefficient you obtained between the linear fit and the data. p. 1654, last section : This section is really too short. You don't present the meteorological data, you don't present the model (is it that of Guenther, 1997 or something derived from it) and give details on how it works and you propose a conclusion without developing the subject. Nothing is validated and we should take it for granted.

Conclusion: p. 1654 : "Significant fluxes of methane and isoprene ..." Again, I would have liked to see them for the whole period. It would have been more reliable to better validate your data and say something about it in the conclusion. The conclusion is as short as the paper and don't highlight the measurements importance.

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