Biogeosciences Discuss., 7, C82–C85, 2010
www.biogeosciences-discuss.net/7/C82/2010/

Biogeosciences Discussions

Interactive comment on "Long term BVOC fluxes above mountain grassland" *by* I. Bamberger et al.

Anonymous Referee #4

Received and published: 19 February 2010

General Comments

This paper describes measurement of BVOC fluxes performed in an Alpine grassland during 2008. Measurements were carried out during an entire growing season, thus a robust database on the main BVOC emitted from this managed ecosystem is provided. The authors estimated fluxes applying two different PTR-MS/vDEC processing techniques, showing that both methods return similar values. Overall, the paper provides important and original information, and should be published in Biogeosciences after some corrections. The rigorous methodological approach used to calculate fluxes is notable, and enough emphasized in the manuscript. However, the discussion section is still poor. In addition to the methodological aspects, the paper would benefit of more intercomparison with similar studies briefly mentioned in the manuscript. Important topics as the potential role of the emitted BVOC in the chemistry of the atmosphere, or the use of the collected database for modeling purposes is not adequately considered,

although these arguments can be out of the scope of the paper. The manuscript can be read clearly, although a revision form a native English speaker is recommended.

Specific Comments

P84-L10. The term independent is often used to describe the two methods. In my imagination, two methods are independent when measuring fluxes with different instruments and/or micrometeorological techniques, e.g. PTRMS vs GCMS. This is not the case when the same instrument is used and also some steps of the data processing are identical.

P86L11. For considerations on annual emission budget, it would be helpful to highlight the duration of these three growing periods which determine emissions.

P86L20. Did you record precipitation events during the measuring period? If so, it should be mentioned.

P87L3. "Air was sucked. . ." is an inappropriate slang. I would rather say " Air was pulled", or similar.

P87L22. From what I understand from the diagram, zero air was used to dilute calibration gases, and this zero air is humid because produced using a Zero Air Generator. Is that right? This should be better specified. Figure 2 is well designed, but the legend could be a little more explicative. It should be mentioned also if all measured masses were calibrated with the standards, or other analytical methods were used. Showing the sensitivity factors in a table could be appropriate.

P88L1. Dwell time, is mentioned. Integration time is reported in Table 1. Please be consistent with the definition. What justify a higher integration time for Methanol? Maybe a minor transmission efficiency for PTRMS? Please motivate the use of 0.5 s.

P90 L8. " A significant background drift. . .". How is this significance evaluated? Please specify.

BGD

7, C82–C85, 2010

P90 L16. Is there any reference or other works in which the outlier removal is mentioned?

P92 L1. The site characteristics should be reported in the M&M section, unless strictly coupled to the discussion, which is not the case in this paragraph.

P92L 5-7. More discussion is needed here. Which order of magnitude are we talking about? Has the experimental site of Brunner et al. the same characteristics?

P92 L25-30. Please rephrase this entire paragraph, the message is clear but the English form need some revisions.

P93 L 12. The range reported (7-9 ppb) is higher than what can be observed in figure 8.

P94 L 5-7. This paragraph should be rephrased. Maybe out of the scope of the paper, but a more detailed analysis of dependence of methanol fluxes from light and temperature could be performed. You recorded meteorological parameters which could be used in models of emission based on light and the effect of light + temperature (e.g. Guenther et al. 1995, 2007, Tingey et al. 1992). Observing the regressions between measured and modeled fluxes using the two different algorithms could help to understand which of the two algorithms better predict methanol emission. This could help the modeling community to estimate regional and global emissions of this important compound. Basal emission factors could be also calculated using the above mentioned models.

Table 1. Some more information on the possible compounds could be provided, e.g. acetone (m/z 59), isoprene (m/z 69). In this table, averaged sensitivity factors could be added.

Table 2. This table is not very clear, and maybe not necessary. You could mention the % of the half hours which did not fulfill the quality test in the M&M section.

Figure 2. More explanation in the figure legend could be helpful.

BGD

7, C82–C85, 2010

Interactive comment on Biogeosciences Discuss., 7, 83, 2010.