

## ***Interactive comment on “C<sub>2</sub>-C<sub>10</sub> hydrocarbon emissions from a boreal wetland and forest floor” by H. Hellén et al.***

**H. Hellén et al.**

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Reply to referee 3

We would like to thank referee for the good remarks and critical comments. As a result of referee's comments we are now able to submit improved version of the manuscript. Replies on the comments and changes to the manuscript are listed below.

Referee commented that paper suffers from limited data and especially more summer measurements should be conducted. However, summer emissions of forest floors have been found to be negligible already in earlier studies (Janson (1993), Janson et al. (1999), and Hayward et al. (2001)) and therefore the main focus of this study was other seasons (Spring and Autumn). Spring was also of interest at the measurement location since monoterpenes are precursors of the secondary organic aerosols and most of the new particle formation events occur in spring (Mäkelä et al. 2000). A few summer measurements were conducted also here to confirm the earlier results and

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even though there were only a few measurement days during summers 2004 and 2005, several measurements were conducted. Because of the very laborious measurements and analysis (6 samples for one data point = several hours of sample preparation and analysis for one data point), also data set for spring and autumn is quite scarce and therefore as suggested by the referee more careful wording is used in the revised manuscript. In our opinion this small data set is still worth publishing since, according to our knowledge there are no similar or more intense measurements of VOC emissions from forest floor in the literature.

More discussion of the litter being probable source and more careful wording were added to the revised manuscript. It is not assumed that only needle litter, but also other decaying plant matter is the source of these emissions.

Sedges were removed already well before the measurements and because results were so clear, no limited resources were put on more replicates on this matter. However more careful wording is used in the revised manuscript.

Referee commented that measurements are inadequate to permit the discussion on magnitude of chloroform emissions from boreal forest floor. However, in our opinion, this was just a first estimate of the possibility that also boreal forest might be a significant chloroform source. According to our knowledge, no results from the measurements of chloroform at the boreal forests have been published. In this study it is shown that these types of forests might be a significant source globally, but more measurements at different kind of sites are needed in the future to better characterise the emissions. This is also clarified in the revised version of manuscript. It is also added that collars were placed randomly to the ground. However, vegetation was quite similar in both collars.

As suggested by the referee more discussion of the possible reasons for the lack of halogenated hydrocarbon emissions from the Siikaneva fen is added to the revised manuscript.

Answers to the specific comments:

-Aims and importance of the study are clarified in the introduction of the revised manuscript.

-Emission algorithm description was moved from the results section to the section Materials and methods.

-Misspelled scientific names of the plant species are corrected in revised manuscript.

-Climatic data is given and discussed in the new version of the manuscript.

-More details to the sampling description of the revised manuscript are added. Chamber is described in more detail. More description of the adsorbent sampling is given. It is already mentioned in the original manuscript that Teflon-membrane pump was used to mix the air in the chamber (p. 1798, line 20).

-The blank test is better described in the revised manuscript

-Seasonal development is changed to seasonal growth pattern of the moss and other vegetation and it is also added that water content refers to plants.

-In new version of the manuscript it is explained why REA may give different results than chambers.

-It is added to the manuscript that snow melted in the beginning of the April.

-Figure 1 is removed from the revised manuscript

-Figure captions were clarified. For figure 3, x-axis was changed from the category to value axis. However, for figure 4 we were not able to produce clear figure with value-axis. Using the value-axis, comparison with the Scots pine emissions became difficult. Dates are labeled according to the journal instructions in the revised manuscript.

-references to the study of Hakola et al. (2005) were added to the figure 4 and figure caption of the revised manuscript

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-Referee suggested that the Figure 5 could be omitted, because the data could also be presented in a small piece of text. However, we decided to leave the Figure 5, because it clearly shows how little variability there was during the time of measurements.

-The English language is revised

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Interactive comment on Biogeosciences Discussions, 2, 1795, 2005.

**BGD**

2, S973–S976, 2005

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