

Interactive comment on “C₂-C₁₀ 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 2

We would like to thank referee for the very good and valuable comments, which clarified the manuscript substantially. As a result of referee's comments we are now able to submit improved version of the manuscript.

1. Referee commented that investigations of these compounds have been accomplished in several other studies. However, to our knowledge emission measurements from wetlands and forest floor are very scarce, especially in the boreal zone. Based on the earlier studies mentioned in the manuscript we assumed that boreal zone may be a significant source for halogenated hydrocarbons, but there were no data of that. This was the reason for us to start the measurements. At the same time it was interesting to study none-halogenated hydrocarbons and this could be accomplished using the same methods. In addition to this we assumed that forest floor might be a significant source

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during spring and autumn, but there were no data on that. Earlier studies were focused on summer only. As suggested by the referee, aims and importance of the study are clarified in the introduction of the revised manuscript.

2. CFCs were not the interest of the study, but they were accidentally mentioned in the analysis description of the manuscript. Reason for this is that using the same method and standard gas it is also possible to analyze them. However, they were removed from the description of the revised manuscript.

3. Using VOC for none-halogenated compounds and VHOC for halogenated compounds clarifies the manuscript and those abbreviations are used in the revised version of the manuscript. As also recommended by the referee manuscript was re-structured and for example results for the VOCs and VHOCs were separated into different sections.

4. Some more discussion of the halogenated hydrocarbons was added to the revised manuscript. However, in our opinion detailed discussion on the formation mechanisms of the substances was out of the scope of this study. In addition to this formation mechanisms of halogenated hydrocarbons are recently reviewed by Laturnus et al. (2005). Reference to that study can be found from the revised manuscript.

5. As suggested by the referee a table of the details on the environmental conditions occurring during the sampling is added to the revised manuscript. Referee also raised a question, why same sampling periods were not used at the both location. It was not possible to measure same time at both locations, because same equipments and manpower were used. In forest floor emissions focus was on spring and autumn emissions because in the earlier studies, summer emissions have been found to be low. This was again confirmed in our study. Spring is also of interest at the measurement location since monoterpenes are potential precursors of the secondary organic aerosols and most of the new particle formation events occur in spring (Mäkelä et al. 2000). On the other hand in earlier studies, isoprene emissions from wetlands have been found to be

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temperature and light dependent and therefore emissions were assumed to be highest during the summer. As mentioned in the manuscript one additional measurement was conducted at Siikaneva in 2005, because in the data set from 2004, there were not any warm and sunny days. Cold and rainy weather was assumed to be the main reason for the discrepancies between this and other studies.

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