

***Interactive comment on “Quantitative long-term measurements of VOC concentrations by PTR-MS: annual cycle at a boreal forest site” by T. M. Ruuskanen et al.***

**T. M. Ruuskanen et al.**

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We thank the reviewers for their constructive criticism. Below you find detailed answers to the points raised. The page, line and Figure numbers refer to the paper published in ACPD.

We have now clearly stated the scientific aims of the study in the Introduction. These are: 1) How do the concentrations of the studied compounds at our remote rural site compare with the ones presented from remote arctic on the other hand and in the rural central Europe on the other hand. 2) How well do the previously reported short term measurements represent the variation in the VOC concentrations. 3) Is there significant interannual variation in the VOC concentrations and can we associate them to either

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biogenic or anthropogenic origin.

The literature review is shortened and more data interpretation included. Especially we have included analysis of distribution of day and night time concentrations of monoterpenes and analysis of interannual variability of methanol and carbonyls. Discussion on the measured datasets against models and improvement suggestions of models are beyond the scope of this paper. Back-trajectory analysis is now also included.

Specific notes:

We have shortened the 'Results' section by removing literature review.

P. 86, line 18. Corrected the text.

P. 87, line 5. Filtering criteria was changed to be 1.5% of lowest and highest measured values for each compound and on monthly basis: 'Outliers were removed from raw VOC volume mixing ratio data by removing 1.5% of the lowest and highest measured values for each compound we measured during each month.'

We have investigated the detection limits during the measurement period. Typical detection limits and their definition are already presented in Taipale et al. (2008) and for Figure 6 we have removed the volume mixing ratios below corresponding typical detection limits. As the sensitivity of the instrument changes with e.g. changing primary ion signal. Thus listing sensitivity would be impractical. For part of the compounds (but not all) the lack of diurnal cycle in winter can indeed be due to the concentration being below detection limit. This is now indicated in the text.

We have changed the structure of the manuscript to a more conventional one, consisting of Introduction, Methods, Results and Discussion, and Conclusions. The Results and Discussion is further divided into subsections 'Seasonal variations', diurnal variation' and 'Interannual variation'. We hope that this makes the paper easier to follow.

P. 89, lines 25-27: We have removed the discussion on the meteorological variables from the Results except for a very short mention of differences between years in the

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subsection 'Interannual variation'.

P. 94, lines 20-27: the discussion on logging has been removed as it was mainly speculative in this context.

'Conclusions' has been mostly rewritten to indicate the results and conclusions from this study.

We have removed the sections reproducing the Table 1 from the text.

The acetonitrile was unfortunately not measured before spring 2007 and thus only a time series for summer 2007 is presented in the Figure.

Figure 13 has been removed as suggested.

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Interactive comment on Atmos. Chem. Phys. Discuss., 9, 81, 2009.

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