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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Sesquiterpenes identified as key species for atmospheric chemistry in boreal forest by terpenoid and OVOC measurements" *by* Heidi Hellén et al.

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Anonymous Referee #3

Thank you for the very good comments. We have considered them and we have improved our manuscript based on them as explained in more detail here:

Section 3: Was there any dependence on humidity or an increase in MT or SQT emissions after rain events? Also, a time series and more complete summary of relevant statistics would be a great addition, even if it is in the supplement.

- Due to the strong effect of the mixing layer height, we were not able to detect any

effects of the humidity. At this site the relative humidity also follows the similar diurnal cycle as the mixing layer height and MT concentrations. No correlation between daily means of relative humidity/rain events and MT or SQT concentrations were found either.

- We feel that showing the time series for this long and varying data is unnecessary and would produce only very unclear figures. However, the whole data set is available on request from the authors and we modified figure 1 to show 'box and whisker'-plots of different compound groups, so that the variability of the data is more visible. We also added a partial time series of MTs as a supplement figure S1.

P3 L17: Better to directly state that the GC's used in this study had technical difficulties rather than stating that all VOC measurements are "susceptible to technical failures."

- This has been corrected.

P4 L32: The use of "followed by" and "following" should be replaced by the more accurate terminology "characterized" and "measuring," respectively.

- This has been corrected.

P5 L1: Are the MT sum from GCMS2 presented? If so, a comparison to the individually summed MT from GCMS3 should be presented in the supplement. Also, with no ozone trap described for this instrument, I would suspect that the measurements will suffer from artifacts.

- Sampling times for GC-MS2 and GC-MS3 were different, so that a direct comparison is not possible. Nevertheless, we added times series of both instruments as a supplement figure S1.

- In our inlet test with 50 ppb of O3 (Hellén et al. 2012), no severe losses of MTs have been observed even though most SQTs were lost.

P6 L10-15: Why is NO3 not included in these calculations?

- We were unable to find any published yields of nopinone or 4-AMCH from the reactions with NO3.

P7 L7: Equation (5)

- This has been corrected.

P9 L10: Avoid using “level” innplace of the more accurate terms “mixing ratio” or “concentration.”

- Whenever possible we replaced the term ‘level’.

P11 L26: “trees” arenlisted twice

- This has been corrected.

P12 L9: Why was methyl vinyl ketone (MVK) not measured?

- MVK was not included in our calibration standards. However, it is not expected to have a high impact due to the very low emissions of isoprene at the site.

P15 Table 1: Is MLH0-4 and MLH12-16 in local time?

- Local winter time (UTC+2) is used throughout the manuscript. This is now properly mentioned in the manuscript.

P24 L25 and P26 L30: I’m not sure that “deposition” is the correct term here. I think that “destruction” is the proper term.

- The first mention of “deposition” was changed to “destruction”, but in the second instance, the whole sentence was modified based on the comment by the reviewer 1.

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