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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Long-term total OH reactivity measurements in a boreal forest" *by* Arnaud P. Praplan et al.

Anonymous Referee #1

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The authors report OH reactivity measurements at a measurement site in Finland, where a large fraction of measured OH reactivity was not explained in previous campaigns. Here, the authors measured a larger set of OH reactants for at least part of the measurement period. Nevertheless, similar results as in previous studies were found demonstrating that the nature of a large fraction of OH reactants in the Boreal forest in Finland is not known. The manuscript is well suited for publication in ACP after considering the following points:

The manuscript could be more focussed on the measurement and less on the instrumental part. A large fraction of the instrumental part is repeating what is described in an earlier paper by the authors. Figures are in general very complex and contain a lot of information. I would suggest re-considering, if all information is needed and what

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Discussion paper

can be taken out or moved to the Appendix.

P5 l11: I think it should read something like: “The OH reactivity of a compound is the inverse lifetime of OH with respect to its reaction with the compound."

P5 l23: The authors might want to mention that HO2 is concurrently produced.

P6 l11: Better give quantitative numbers instead of a qualitative statement “usually small”

P6 l27: There is something missing in the reference

P7 l3: “assumes” instead of “assume”

P7 l4/5: The authors might want to consider rephrasing the sentence.

P7 l8-10: First, the authors state that the correction was applied for certain conditions, but say in the next sentence that conditions were never met for the correction. I would suggest combining the statements.

P11 l12/13: I would suggest explaining what kind of “amendments by Michoud” were included. What is meant by the “minor improvements”?

P12 l10: What is meant by “photochemistry has been improved”? What are the changes and how important are they?

P12 l16: It would be helpful for the reader to get an estimate of the lifetime of oxygenated VOCs in the model, in order to judge how important deposition was.

P14 Table 1: Please indicate what x and y in the regression is.

P14 l4: The authors mention an exponential fit, but show a linear fit in Table 1. I would rather give one approach.

P14 l7/8: Is this statement justified? This is also the period, when the lowest number of instruments measured OH reactants.

P18 l8: Is there a hint that measured OVOCs are not explained by gas-phase oxidation, but require such re-emission processes to justify this hypothesis?

P18 l17: “indicate” instead of “indicates”

P20: The discussion about the additional uncertainty of the O3 correction from the O3 measurement being at a different sampling point might better fit earlier in the instrumental section.

Figures in general: Symbols are often too small and hard to distinguish. Font sizes of legend texts are often too small.

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