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Atmospheric Chemistry and Physics Discussions

Interactive comment on "In situ secondary organic aerosol formation from ambient pine forest air using an oxidation flow reactor" *by* B. B. Palm et al.

Anonymous Referee #2

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This study is focused on using an oxidation flow reactor to study secondary organic aerosol formation in a forest environment. During the BEACHON-RoMBAS field study multiple VOC species and organic aerosol concentrations were measured. The authors predicted the SOA concentrations by using the measured VOCs and known SOA yields. The predicted SOA concentrations show that still there are unmeasured SOA precursors in the forest environment. The findings of this study could help to better understand and model the SOA formation in an environment dominated by biogenic VOCs. The study demonstrates that the oxidation flow reactor is a powerful tool to study the contribution of different unidentified species to SOA formation. The paper is well written. I have some minor comments on the paper.

Show all the SOA yields used in the calculations in a separate table. In SOA calculations do you take into account BVOC oxidation by ozone?

You use a number of abbreviations, please put them in one table so it's easier to follow. For example, what is "CS"?

Section 3.6.2: You didn't use any aging in calculation of SOA formation from measured VOCs. Here you state that "At night, O3 and NO3 may react with the C=C-containing MT and SQT emissions leading to a buildup of S/IVOC oxidation products that lack C=C double bonds, molecules with which O3 and NO3 generally do not react". Doesn't this imply that these first generation oxidation products of monoterpenes will produce more SOA by further oxidation? Therefore, applying aging in the calculations would reduce the gap between predicted and measured SOA. I'm aware that there are some uncertainties related to using aging in the SOA predictions. Nevertheless, there are several papers based on laboratory studies, which show multi-generational SOA production from alpha-pinene.

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 30409, 2015.

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