

***Interactive comment on “The bi-directional exchange of oxygenated VOCs between a loblolly pine (*Pinus taeda*) plantation and the atmosphere” by T. Karl et al.***

**T. Karl et al.**

Received and published: 18 October 2005

RC: Abstract: "I would suggest adding a note about the decrease in emission of oxygenated compounds in the post-ozone-fumigation phase, as I think it is an important finding (indicative of physiological stress symptoms)."

AC: added to Abstract: "Short-time (approx. 2 hrs.) ozone  $\ddot{E}$ .decreased the exchange rates of acetaldehyde."

RC: "Introduction: I would propose to add the most recent paper on methanol and MVK/MACR flux measurements deploying EC measurements by Spirig et al. (Spirig et al., Atmos. Chem. Phys., 5, 465-481, 2005), also as a reference in the discussion

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section: actually the daytime mean emission rate reported by Spirig et al. 2005 (0.31 mg m<sup>-2</sup> h<sup>-1</sup>) fits perfectly to the daytime ILT (0.52) and EC (0.32) measurements of this manuscript, even though it was a mid-latitude forest canopy comprised mainly of *Quercus robur*."

AC: Reference was added in introduction and discussion.

RC: "For example comprehension of the difference between the meaning of "mean exchange velocity" and "net exchange velocity" (integral over the canopy height) seems important in my point of view."

AC: Ok, added more information on how different quantities are defined.

RC: "Results/ Discussion: The authors state that rates of photosynthesis, transpiration and stomatal conductance were calculated for the enclosure measurements, but no results are mentioned in the following sections. Nothing interesting? For example, the authors state that the decrease of emission in the days following ozone fumigation may have been due to enzyme depression, but changes in primary physiology were not significant. There would be a good chance to show these data in table 2 (mean daytime photosynthesis, or max. photosynthesis, best: gross photosynthetic capacity, if available)."

AC: "Added daytime photosynthesis rates to Table 3 (former table 2). Also added new measurements and figure (figure 4) showing net photosynthesis rates and total conductance."

RC: "Like referee #2, I also am also keen on the compensation point increasing exponentially with temperature, as it is already mentioned in the abstract as one important finding."

AC: Added a new figure showing the compensation point as a function of temperature.

Minor Comments:

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RC: "Page 5877, line 23:" AC: Ok, changed. RC: "Page 5879, line 9: Page 588, line 17: Page 5883, line 19:" AC: corrected. RC: "Page 5884, line 29:" AC: changed to VOC emissions RC: "Page 5889, line 10:" AC: Added reference. RC: "Page 5891, line 2:" AC: sentence revised RC: "Page 5891, line 2: Page 5892, line 6:" AC: changed as suggested RC: "Table 3:: AC: Regression for sweet gum is now forced through zero. Added a sentence plus reference on old vs young leaves to Conclusion

RC: "Figure 3:" AC: Ok, added new figure showing diurnal cycles of measured canopy concentrations.

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Interactive comment on Atmos. Chem. Phys. Discuss., 5, 5875, 2005.

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