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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Analysis of coherent structures and atmosphere-canopy coupling strength during the CABINEX field campaign: implications for atmospheric chemistry" *by* A. L. Steiner et al.

Anonymous Referee #1

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This paper concerns the transport of heat and momentum by coherent turbulent structures in a temperate forest. The data used for this analysis come from a one-month field mission called CABINET. Standard techniques are used to detect sweep and eject events and to quantify their frequencies of occurrence during stable and unstable conditions. Estimates are made of the contributions by these events to the heat and momentum fluxes. The manuscript is well written and the experimental data appear to be in good quality.

In the present form, the paper is not suitable for publication. The title is original and

so is the research problem (that these coherent events occur at time scales that may be relevant to chemical reactions inside the canopy). However the conclusion, that the coherent structures play an important role in heat and momentum transport, is not a new finding. I also see little innovation in their research methodology. Some of the data graphs may be useful for other people on the CABINET science team, perhaps as part of the general characterization of meteorological conditions during the experiment, but are not strong enough to justify a research article on this subject.

I encourage the authors to shift emphasis away from what is already known about these coherent motions, to the chemistry link implied by the title of this manuscript. For example, they could link the coherent motions with episodic events revealed by the chemistry data obtained inside the canopy. Furthermore, they could parameterize these fine-scale turbulent motions into an in-canopy chemistry model and quantify how the ozone and VOC kinetics are modulated differently by the sweep and ejection events. These tasks will be time consuming but can lead to a potentially high-impact paper.

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 21013, 2011.