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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Eddy covariance fluxes of acyl peroxy nitrates (PAN, PPN, and MPAN) above a Ponderosa pine forest" *by* G. M. Wolfe et al.

Anonymous Referee #1

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This manuscript is an excellent contribution to the BEARPEX 2007 special issue and fits equally well within the scope of ACP. It contributes in particular to improving our understanding of the atmospheric chemical processing of biogenic and anthropogenic emissions and effects on forest ecosystems.

The methodology of measuring eddy covariance fluxes of several key acyl peroxy nitrates (APNs) is rather unique. It provides new information about the deposition rates of PAN, PPN and MPAN, whereas previously single APNs, notably PAN (or total peroxy nitrates), have been studied based on eddy covariance measurements or less accurate techniques (in less recent work). The only comparable dataset was collected by

Turnipseed et al (2006).

The datasets presented in the manuscript will be highly valuable to help test computer models that account for micrometeorological, canopy and atmospheric chemical processes. Is it planned within BEARPEX to also include modelling studies?

The results are thoroughly analyzed and the conclusions are very interesting, including indications about the role of chemical processes within the canopy and reactive uptake of PAN on the non-stomatal surfaces of leaves and soils (even though these conclusions are to some degree speculative). I recommend publication with minor modifications only.

Comments:

1. Since this is the first paper of the BEARPEX special issue it is desirable to extend section 2.1 with a more comprehensive characterization of the sampling towers and of the meteorological measurements, including some photos (possibly partly in supplementary material).

2. Since the capability of measuring additional APNs is indicated (p.9 ”A larger suite of APNs were monitored..”) it would be nice to see some of these results, e.g. by adding one figure and mentioning some salient features in the text.

3. p.23: What is meant by ”instrumental issues during wet period”?

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 17495, 2008.