

***Interactive comment on “Observations of HNO<sub>3</sub>,  
ΣAN, ΣPN and NO<sub>2</sub> fluxes:evidence for rapid HO<sub>x</sub>  
chemistry within a pine forest canopy” by  
D. K. Farmer and R. C. Cohen***

**Anonymous Referee #3**

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This paper describes some surprising flux estimates over a ponderosa pine forest in Northern California. The TD-LIF technical details are described in a previous paper and this work primarily puts forward potential explanations of the observed fluxes.

The observed fluxes are surprising and difficult to easily explain. The authors attempt to explain the fluxes by invoking a very high radical concentration within the canopy. They support this argument using some simple modeling and referencing indirect evidence of highly reactive VOC emissions from the pine canopy.

I think the authors have carefully and succinctly made an argument. The argument itself may in the future be shown to be incorrect, but based on the information they

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have at hand, it seems reasonable.

I have two primary issues with the overall argument. First, the residence time of 400 seconds for OH seems quite long and based on a fairly weak argument. Second, the results they present are in stark contrast to the recently published (Turnipseed et al. 2006, JGR-Atmospheres) estimates of PAN deposition measured over a similar canopy (Loblolly pine) in North Carolina.

However, answering the needed questions regarding the residence time of OH and flux divergence will require significant additional measurements. This is one of the cases, I would argue, that the information needs to be published and presented to the scientific community to stimulate additional measurements.

Simply stated, the authors have carefully and rigorously made an observation and produced a potential argument. The argument is obviously not based on a complete set of information, but this should not impede the publication of this work.

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Interactive comment on Atmos. Chem. Phys. Discuss., 7, 7087, 2007.

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