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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Virtual disjunct eddy covariance measurements of organic compound fluxes from a subalpine forest using proton transfer reaction mass spectrometry" *by* T. G. Karl et al.

Anonymous Referee #1

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This manuscript applies a new approach, virtual disjunct eddy covariance (vDEC) coupled with proton transfer reaction mass spectrometry(PTRMS) for measuring ecosystem scale fluxes of biogenic VOCs at a subalpine forest in Colorado, USA. The most valuable portion of the paper is the careful evaluation of potential systematic errors associated with this new method, and the quantitative error analysis of the resulting measurements. The wind tunnel measurements are particularly useful for evaluating damping effects in Teflon tubing, and for showing that it is a not a significant problem for the measurements as long as the flow rate is high enough. This paper will certainly be quite useful to other research groups attempting similar measurement approaches.

The paper excels as a discussion of the new vDEC-PTRMS approach for measuring fluxes, but it could be improved by a more thorough review of the alternative approaches for measurement of ecosystem scale fluxes and a more complete discussion of why this approach is advantageous for some compounds, but less useful for others.

The presentation of the actual flux measurements is useful as an example of how the vDEC-PTRMS approach can be applied. However, the discussion of the importance of the flux data is too broad and shallow to be very useful for most readers. The one to two paragraph discussions of correlations between flux data and other measured and modeled variables, carbon loss via emissions of the measured VOC emissions, box model sensitivity studies, and impacts on HOx chemistry could each be turned into major and useful scientific discussions, however their treatment in this manuscript lacks sufficient analysis. The manuscript would be substantially improved by providing a more thorough evaluation of what the author considers the most important results in this section, and by removing most of the other discussion.

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