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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Observations of reactive nitrogen oxide fluxes by eddy covariance above two mid-latitude North American mixed hardwood forests" *by* J. A. Geddes and J. G. Murphy

Anonymous Referee #3

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This manuscript gives a thorough presentation of NO, NO2, and NOy mixing ratios and fluxes at two research forests. It is relevant to Atmospheric Chemistry and Physics. Because NOy deposition data are rather limited and emissions in North America have changed significantly since the last extensive study of NOy flux this paper makes an important contribution, and hopefully stimulates renewed effort on long-term deposition studies.

I recommend publication with some minor changes to address points that could be clarified, or reconsidered.

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Interactive Discussion
Discussion Paper

Page 27896, line 18 missing "to" page 27898, line 12, to support the use of night-time NO measure as a zero check the text should note what the typical o3 values were. night time NO would not go to zero if O3 was very low.

page 27902 I think you may not need to consider the O3 correction for fluxes. In the case of gold converter ozone is destroyed in the converter and there is no back reaction. I don't know what the Mo converter does to O3, you ought to check and then ignore this if the O3 is consumed

page 27903 -line3 True the potential error is only 5-10%,. but it is systematic and always affects the mid-day fluxes. After reconsidering whether O3 passes through the Mo converter is the conclusion about overall uncertainty still valid?

page 27903, line 12, the approach of using covariances far from the true lag ought to cite prior use in other studies. Where I've seen this used before covariances are computed at multiple lags in a range that is far from the peak, and the statistics for that covariance provide the estimate of uncertainty.

page 27903, line 17, you say this covariance should be close to zero, is it?

page 27909, periods with rapidly changing concentrations should be evaluated for the magnitude of storage term.

page 27911 line 7 Are the apparent NO2 and NO fluxes distinguishable from being equal and opposite? There is a mechanism for NO2 emission, but NO uptake has not been considered likely. In the case of no net flux of NOx the NO and NO2 would counteract each other. This is mentioned in the discussion section, but here in the results it would help to include some statistical tests and evaluate whether the differences between NO and NO2 flux are outside the confidence limits.

Interactive comment on Atmos. Chem. Phys. Discuss., 13, 27891, 2013.