

Interactive comment on “Exchange of reactive nitrogen compounds: concentrations and fluxes of total ammonium and total nitrate above a spruce forest canopy” by V. Wolff et al.

Anonymous Referee #2

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This paper investigates the dry deposition of total ammonium and nitrate to a spruce forest canopy using a semi-continuous wet chemistry technique. The paper is well written and the subject matter is of interest to a wide audience from ecologists to atmospheric chemists and therefore suitable for publication in Biogeosciences. Though I have only a few comments, collectively they constitute a major revision. However, I believe the authors can easily address the necessary changes without a large increase in the length of the manuscript. I recommend publication subsequent to treatment of these suggestions.

This manuscript deals primarily with fluxes of total ammonium and nitrate and the au-

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thors state that individual fluxes (NH_3 , NH_4^+ , HNO_3 , NO_3^-) will be analyzed in a forthcoming paper. I feel strongly that this manuscript should be modified to incorporate an analysis of the individual fluxes. If the authors had a full year of observations I might go along with the idea of publishing one paper on total deposition and a second, more process oriented paper, focusing on individual compounds. However, one month of observations is not enough to draw any substantive conclusions about total N deposition to the site without a fairly rigorous model-based scaling exercise. The simple scaling exercise to derive annual deposition described in section 4.2 is not appropriate and should be removed from the manuscript (along with Figure 8). In this case, I think a more detailed analysis and discussion of concentrations and fluxes of total ammonium/nitrate and individual compounds yields a much more interesting and useful paper. I suspect there is already significant overlap between the current manuscript and the forthcoming paper on individual compounds (section 3.4, much of section 4.1, points b and c in the Conclusions section). Indeed, the total ammonium/nitrate fluxes cannot be fully interpreted without examination of the individual fluxes.

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