

Interactive comment on “Modeling the dynamic chemical interactions of atmospheric ammonia and other trace gases with measured leaf surface wetness in a managed grassland canopy” by J. Burkhardt et al.

Anonymous Referee #1

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This paper describes measurements and the model interpretation of NH₃ exchange over a grassland in Germany, before and after cutting. Processes included are exchange of NH₃ via stomata; cuticle, leaf surface wetness, and other parameters.

I have read this paper as a non-specialist- being a large scale modeler- therefor I will not comment on detailed parametersations or measurements.

I have however two main points:

- the paper is not very clear about what was already known- and the measurements

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here confirm this; and what is really new material.

- I guess the ultimate goal should be inclusion of this knowledge into CTMs. To my knowledge most models do not even consider compensation point approaches- some models consider a co-deposition approach. Many of the parameters (e.g. apoplastic ratio); realistic leaf surface wetness data, are not available in models. I would like the authors to expand the discussion section that puts their measurements in this perspective: a) do you expect your measurements to be representative for other grasslands? b) what simplifications/assumptions could be made in your parameterisation that could lead to a more realistic description of NH₃ exchange in models. Or visa versa: what are the minimum (but realistic) requirements for models to do a better job c) What do you think the magnitude of current errors in models are due incomplete description of NH₃ exchange.

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