

Interactive comment on “Evaluation of a new inference method for estimating ammonia volatilisation from multiple agronomic plots” by Benjamin Loubet et al.

Anonymous Referee #2

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Loubet and others study a new method for inferring ammonia loss from small agricultural plots.

I found the modeling analysis to make for an interesting case study regarding the applicability of field experiments. The approach treats bias errors carefully. As a consequence, I feel that the manuscript makes an earnest effort to quantify biases associated with passive ammonia sampling over small agronomic field plots and will be a valuable contribution to the literature.

Minor comments: ‘Further work should anyway be produced for validating this method in real conditions’ at the end of the abstract does not sound hopeful. Rather, the

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authors should try to discuss strategies for further improving the method and reducing uncertainties.

Line 41: 55.3% sounds remarkably specific given uncertainties in measuring NH₃ flux.

53: ‘most of the time large fields’ is awkward wording.

57: agronomic trials are not necessarily of those dimensions.

Parentheses on line 67.

118: quotes are unnecessary.

On 130, what is the typical reaction time (and thereby Damkohler number?)

I find the tau near the overbar in 2 and other equations to be a bit distracting because it could be confused with an exponential term.

Equation 4 could be rearranged to reflect that only the numerator of the second term on the right hand side is unknown.

251: why is z_{ref} 3.17 m? The curly braces in $R_b\{NH_3\}$ I find to be a bit distracting.

263: is there a justification for the model in simulation 2?

265: what are typical parameters for the Gaussian model? Also, what mechanism causes it? The urea spreader?

267: I understand why 4.6 now in simulation 2. . .but why does this ‘best’ represent NH₃ emissions?

302: why is the covariance term negligible at the half hourly period? The spectral gap in eddy covariance studies?

303: in 2.5.3, these are not hypotheses as they cannot be falsified, even in the model.

327: extra period

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336: how close is 'nearby'? From the figure it looks like it was part of the larger setup.

355: results should be written in the past tense.

365: define Gamma for the reader in the figure legend.

Please avoid using red and green simultaneously in Figure 4. This figure appears to be made using R, and gray is also a default color. And honestly yellow is never a good choice on a white background.

384: focuses

Figure 6 confuses me a bit because the 13 periods vary so strongly in their meteorological conditions from summer to winter, why are they grouped? The bars also leave the figure in the upper left subplot.

464-466: the attribution of stability with respect to continental vs. oceanic sites is too much of an approximation. There are many continental sites that are consistently windy, often due to orography.

There is a strange x on line 468.

Font sizes for figure 7 should be increased.

741: why bird colonies?

742: again, continental does not imply low wind speeds.

Interactive comment on Biogeosciences Discuss., <https://doi.org/10.5194/bg-2017-424>, 2017.