

Interactive comment on “Surface–atmosphere exchange of water-soluble gases and aerosols above agricultural grassland pre- and post-fertilisation” by Robbie Ramsay et al.

Anonymous Referee #2

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After thorough reading the manuscript I come to the conclusion that it does not meet the standards of atmospheric chemistry and physics and has to be rejected. My rating is based on several points:

Title and abstract promise measurements, findings, and discussions which are not given. Title and abstract are very broadly formulated, while the paper itself lacks of focus.

Substantial supportive measurements are lacking (e.g. aerosol size distribution or even size resolved chemical analysis of the aerosol).

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The text is not structured clearly and way too long.

Some sections contradict each other.

When studying reactive trace gas exchange fluxes, possible flux divergence needs to be addressed. The typical sources for flux divergences are introduced in the introduction but not analyzed and discussed in the paper.

There are several indications for flux divergence in the results. Nonetheless the authors calculate a 'flux' from the measured gradients and even derive a canopy resistance.

Flux limits of detection are explained in the material and method section, but no results are given. Small and bidirectional fluxes most probably were within the detection limit.

At a well-studied site like Easter Bush there should be more information on aerosol chemistry than just the GRAEGOR measurements. The comparison with MARGA results (measured at a distance of 12 km) itself plus the very rough aerosol size analysis is not sufficient.

Furthermore the supportive measurements of the MARGA are not described in the corresponding section. Nor are the NO₂ measurements.

In the comparison of GRAEGOR measurements with LOPAP and QCL measurements discussion is mixed with contents that should better be placed in the material and method and/or the results section. Data for both comparison lack in number, range and supportive measurements, which would help to understand agreement and disagreement.

The presented measurements and results do not lead to the presented conclusions.

Conclusions remain speculative, unfounded and airy.

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Conclusion

The discussion paper does not keep up to the promising title and abstract. The data basis does not appear to bring sufficient material to a paper on its own. Maybe the data can be presented as supportive data in another paper, such as the cited Di Marco et al. one on HONO fluxes.

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