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Reply on RC1

Ruben B. Schulte et al.

Author comment on "Assessing the representativity of NH_3 measurements influenced by boundary-layer dynamics and the turbulent dispersion of a nearby emission source" by Ruben B. Schulte et al., Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2021-907-AC1, 2021

We thank Referee #1 for their thorough reading and comments to our manuscript. The Referee raises several interesting points about the limitations and applicability of the results presented in the study. Below, we would like to give an early response to several of the comments raised by the Referee. We will respond to all points in more detail with the revised manuscript.

- The Referee raises a very interesting point about the representativeness of the results in a different orographic context. This was not considered in the manuscript due to our focus on the Netherlands and the limitations of the model, which requires a flat surface. However, it is possible to represent orographic processes in the model with advection and/or a tilted surface. We are currently looking into how we can best address the points raised by the Referee.

- The Referee suggests to extend the analysis period over which the blending-distance is calculated. We agree that this would be interesting and we intend to perform an additional experiment where the emissions are released at the start of the simulation (8:00 CEST), to analyze the results between 8:00 and 17:00 CEST. Such an experiment could give valuable context to the applicability of the results presented in the manuscript.

- The Referee suggests to show information on different wind directions and different spatial configurations of the measurement sites. We plan to add a new figure where we show the blending-distance for different wind directions. Here, different wind directions are represented by the position of the grid cells with respect to the plume centreline, as each grid cell represents a potential measurement site in the simulation framework.

- Finally, the following comment by the Referee was not fully understood: “It would be also interesting to establish the any minimum requirements that should be accomplish or delimit the specific physical context of the site in which the starting hypothesis and study conclusions are valid. If the models do not take into account this aspect it should be mentioned.” We kindly ask if the Referee could clarify this comment.