

Atmos. Chem. Phys. Discuss., author comment AC3
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Reply on AC1

Tobias Wolf et al.

Author comment on "Dispersion of particulate matter (PM_{2.5}) from wood combustion for residential heating: optimization of mitigation actions based on large-eddy simulations" by Tobias Wolf et al., Atmos. Chem. Phys. Discuss.,
<https://doi.org/10.5194/acp-2021-81-AC3>, 2021

Reply to the comments to the discussion of the preprint.

My general comments were provided already in the previous review phase:

The research questions and methods are novel. However, the biggest issue is that, at its current state, the manuscript does not fulfil one of the main aims of ACP: "The journal scope is focused on studies with general implications for atmospheric science rather than investigations that are primarily of local or technical interest." Currently, the manuscript is very Bergen specific and resembles a project report to the municipality. Hence, for the manuscript to fit into the scope of ACP, a major review is needed.

We are glad to read about the reviewer appreciation of our study. It encourages us to push harder in advancing research in this direction. We also agree that the case study in the manuscript is perhaps too extensive and too specific. However, we think that our arguments are also worth to consider. We want to advance the numerical modeling technique to realistic applications. How would one achieve that without reporting success and failure with a specific case? We all rely on peer-review process to correct and solidify the research. Understandably, the Bergen municipality does not have proper competence to evaluate the work against the research standards. So, we are interested in open and honest discussion of the case study as well, not only the general part of the study. Besides this point, it was and still is rather routinely accepted in the community journals, including the ACP journal, to publish insides into seemingly specific but by the mater of fact useful case studies. Let us look at ACP publications. Among the most downloaded articles you may find the *following case specific studies*:

93,433 downloads: Christoudias, T. and Lelieveld, J.: Modelling the global atmospheric transport and deposition of radionuclides from the Fukushima Dai-ichi nuclear accident, Atmos. Chem. Phys., 13, 1425–1438, <https://doi.org/10.5194/acp-13-1425-2013>, 2013.

63,272 downloads – very close to our subject of study - Benton, A. K., Langridge, J. M., Ball, S. M., Bloss, W. J., Dall'Osto, M., Nemitz, E., Harrison, R. M., and Jones, R. L.: Night-time chemistry above London: measurements of NO₃ and N₂O₅ from the BT Tower, Atmos. Chem. Phys., 10, 9781–9795, <https://doi.org/10.5194/acp-10-9781-2010>, 2010.

31,941 downloads – very close to our subject of study - Zhang, R., Jing, J., Tao, J., Hsu, S.-C., Wang, G., Cao, J., Lee, C. S. L., Zhu, L., Chen, Z., Zhao, Y., and Shen, Z.: Chemical characterization and source apportionment of PM_{2.5} in Beijing: seasonal perspective, *Atmos. Chem. Phys.*, 13, 7053–7074, <https://doi.org/10.5194/acp-13-7053-2013>, 2013.

and among the most recent such publications (1,900 downloads): Hellén, H., Kangas, L., Kousa, A., Vestenius, M., Teinilä, K., Karppinen, A., Kukkonen, J., and Niemi, J. V.: Evaluation of the impact of wood combustion on benzo[a]pyrene (BaP) concentrations; ambient measurements and dispersion modeling in Helsinki, Finland, *Atmos. Chem. Phys.*, 17, 3475–3487, <https://doi.org/10.5194/acp-17-3475-2017>, 2017.

Those arguments support our conclusion that our study is well fitted to the ACP journal and will be interesting for the larger community of readers. In any case, however, we would suggest leaving the final decision on the topical editor. We hope that the reviewer will agree with that.

Some general comments:

1. As mentioned above, the manuscript is now only focused on the city of Bergen and hence the results are lacking general implications. For instance, no comparison with previous studies applying more simplified geometries or real topographies is given. Furthermore, there is rather a lot of discussion about the funding of these kinds of studies by cities, which I think does not fit the scope of ACP.

We hope that we answered to this concern above. As for previous studies, there are no such studies directly comparable with our results either by method or by subset of input data.

As for “the funding discussion”, we believe that this is a matter of certain misunderstanding. We do not discuss funding of studies in the published preprint. We discuss how our modeling methodology might help to optimize socio-economic policy scenarios. To our view, this is important aspect of the science published by ACP, just look at the list of the most influential relevant papers given above.

▪ **Now the manuscript is difficult to follow. This is partly related to the language and partly to the structure of the manuscript. At least these points require improvements:**

- The aims of the study must be stated clearly
- Sections 1 & 2 should be merged because they overlap a lot regarding the content.
- The language requires revision. Firstly, the paragraphs are lacking coherence and the text is missing flow. Secondly, the application of articles (a/the) and prepositions must be double-checked.

The required corrections have been introduced. We disagree that the paper is difficult to follow. It is written in plain language checked by the English speaker. The structure complies with the IMRAD standard for research papers. We will provide further revision in the final version of the manuscript if any.

Thank you for your minor but very important corrections. We have now included all of them into the text.