

Response to technical corrections

What follows is the response to the request for technical corrections from Reviewer #2, available via MS system of ACP journal (and later, after acceptance and submission, to the public). The paper that this concerns is:

“Impact of atmospheric turbulence on the accuracy of point source emission estimates using satellite imagery”, by Galkowski et al., available at:

<https://egusphere.copernicus.org/preprints/2024/egusphere-2024-2792/>

The original text from the reviewer is given in **black**, while the responses from authors are in blue. Text cited from the manuscript is in *italics*. In this document, we refer to the original manuscript using Lx notation (consistent with the reviewer’s comments), while an R index is added when the revised manuscript is cited. For example, L15 refers to the original manuscript, while RL15 refers to the revised version.

Note from authors:

Before addressing specific comments, we would like to offer our sincere thanks to both reviewers for taking time in review and in reading our response. All comments are highly appreciated as they have made our study better in many respects. We have added a comment in the “Acknowledgments” section stating so.

Remarks from referee #1

Note: author made no comment and “accepted as is”.

Remarks from referee #2

The revised manuscript is greatly improved:

- The introduction was too general and is now much better tailored to the scope of the study.
- The role of the tagged tracers is now better motivated
- The basic hypothesis that the initial wind conditions at the point of release critically determine the turbulent structure of the plume and correspondingly the emission estimates at different downwind cross-sections, is now better substantiated. This seems to me to be the most important conclusion of the study.

My remaining comments have been addressed appropriately.

A few remaining corrections:

- Line 167: "the power plant we operational" -> "the power plant were operational" - [corrected](#)
- Line 190: the second "dilution" should be deleted - [deleted](#)
- Line 429: "especially with regards to wind" should be explained better. Which assumption regarding winds is not fulfilled? The assumption of stationarity?

The sentence in question (RL427) has been expanded, it now reads:

A larger number of truly independent samples could theoretically reduce the uncertainty, but for a single scene this may mean sampling at distances where the signal-to-noise ratio becomes too low. Another risk at large distances is that the assumptions of the CSF method, specifically regarding the uniformity of the wind speed and direction, may no longer be fulfilled.

- Line 524: In table 2 it was 14.2%, not 14.3% - [thank you for spotting this, it is corrected](#)

Other corrections

Apart from the technical corrections requested by Referee #2, we took the opportunity to fix minor typing errors that evaded detection. As these are very minor, we do not list them here. These can be found in the tracked version of the manuscript. We have also altered the Acknowledgment section, adding thanks to the reviewers, and adjusting minor language issues.