

# Author's response

Dear Editor,

thank you for your checking of our revised manuscript and for your comments. We agree with your suggestions and we have implemented them in our minor revision. We follow with the replies to each of your comments:

*Abstract: the anonymous referee #1 requested more information to the abstract. I only see changes in wording but I do not see that this answers the request of the reviewer. Could you please include more novelty detail in the Abstract with a bit better description of the improvements and maybe even how much certain points have improved (significantly is mentioned but maybe even give some numbers).*

We agree that the changes to the abstract did not go as far as the comment by Referee #1 suggested. To correct that, we have extended the description of the novelty. We also tried to further specify the improvement with numbers, but we realized that any short numerical description without adequate context would be misleading, and the context needed to properly qualify the numbers would exceed the acceptable length of the abstract. Therefore we decided to specify the improvement by describing a very large simulation, which is further described in Section 5.4, to illustrate the improved performance and scalability.

*There are missing equation numbers through the manuscript. Please add these.*

We apologize for the missing numbers. Originally we had misunderstood the GMD guidelines by thinking that it only specified the format of the numbering, and we only numbered the equations that were referenced from other parts of the manuscript. We have now added numbers to all equations and we have also verified that all the cross-manuscript references match the format specified by the GMD guidelines.

*P16, L404: You write "We believe that this difference can only be significant for very special cases (e.g. low azimuth direct solar radiation reflected from treetops towards the tops of nearby buildings where such buildings do not shade the the treetops completely) and we have not encountered significant amounts of such cases in our urban simulations, but the frequency of these cases has not been studied in detail" but this comment is very specific to the particular case(s) you have examined. Answer to the referee request should be made more general and not just mentioning that you have not encountered such issues but rather providing information. This can likely bring uncertainty but even if you have not encountered large differences in your cases it does not mean that someone else could not encounter.*

We agree that this statement did not describe the issue adequately. We have replaced the description with a more general description and we have also acknowledged that our current knowledge of the impact of the disregarded effect across generic simulations is limited. We have also added a remark in

Section 6.1 (Outlook) that the impact and possible improvements are being studied.

## List of changes in the manuscript

The line numbers in this section refer to the provided author's track-changes file generated by latexdiff.

- L6–12.** Abstract reformulated and extended as suggested by the editor.
- L77.** The novel raytracing algorithm was missing from the list by mistake, it has been added.
- L412.** Description extended for clarity.
- L424–433.** Description reformulated and extended as suggested by the editor.
- L961–964.** Added a mention about further research on the issue described in L424–433.

Apart from the listed changes, all equations have been numbered, which is rendered in latexdiff as if the equation was changed itself. All cross-references have been reformatted to match the GMD guidelines.