Authors' reply to comments of the editor on the manuscript "MUNICH v2.0: A street-network model coupled with SSH-aerosol (v1.2) for multi-pollutant modelling"

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We appreciate the reviewers for reading the manuscript attentively and giving helpful comments to improve it.

1 Reply to the editor's comments

1. The reviewer 2 pointed out that the paper lacks scientific insights regarding the results of the various simulations being reported and presented PM/NO2 example. You succesfully added more description on PM/NO2 part but not elsewhere. Thus you should carefully revise the manuscript and add addition description to those parts where it is missing. This applies at least to sections 4.1, 4,2 and 5.1.

   Our response:

   The manuscript has been revised to add the following texts in Section 4.1

   "This increase is due to lower wind velocity at the roof level with the MACDONALD parameterisation, which leads to a lower dispersion of NO_x from the streets where the air monitoring station is located."

   in Section 4.2

   "The computation of the vertical flux depends on the gradient between the street concentration and the background concentration in both parameterisations. The gradient is large during the rush hours because of high traffic emissions. This large gradient leads to a large difference in the vertical flux between Case-1 and Case-7 during the rush hours."

   "$PM_{2.5}$ concentrations are less sensitive to most parameterisations than NO_2 concentration in our simulations except for the Case-2 simulation (see Table 4). This is due to a larger contribution of background emissions for $PM_{2.5}$ than NO_2."

   and in Section 5.1

"Lugon et al. (2021a) showed that the average impacts of secondary aerosol formation on $PM_{2.5}$ concentrations over the streets in Paris are 12% for organic aerosol and 7% for inorganic aerosol."

"Very low change in sulfate is obtained because the sulfate in the streets in mainly imported from the background (Lugon et al., 2021a)."

"It is however worth noting that the emission from the urban vegetation is not taken into account in this result."

2. L268: MACDONAL is missing D.

Our response:

It has been corrected in the revised manuscript.

3. To clarify reading of the figures, I recommend you add panel information (a-..) to the figure texts where it is missing. This applies at least to Figure 1 (instead of upper and lower three cases use a-c, d-e), Figure 2 (plan and frontal, I would also add abbreviations of them to to the text as these are not necessarily familiar for all readers), Figure 7 and Figure 8.

Our response:

As the Editor's recommendation, the figure texts have been corrected as follows:

in Figure 1,

"Variation of pollutant concentrations in a street network depending on wind direction, which are indicated as arrows in dark blue. The wind speed is $5\,\mathrm{m\,s^{-1}}$ for (a), (b) and (c) and $10\,\mathrm{m\,s^{-1}}$ for (d), (e) and (f)."

in Figure 2,

"(a) $d_c/\overline{H}$ and (b) $z_{0_c}/\overline{H}$ as a function of the plan and frontal area densities (λ_P and λ_F) calculated by Eq. 3"

in Figure 7,

"Comparison to observation of (a) NO and (b) NO_2 hourly concentrations (in $\mu\mathrm{g\,m^{-3}}$) using two different parameterisations to compute the wind velocity at the roof level: SIRANE (Case-1) in red and MACDONALD (Case-10) in blue."

in Figure 8,

"Comparison to observation of (a) NO_2 and (b) $PM_{2.5}$ hourly concentrations (in $\mu\mathrm{g\,m^{-3}}$) using SCHULTE (Case-1) in red line and SIRANE (Case-7) in blue line."

4. Figure 5 has too small fonts in x- and y-axis for it to be readable with 100% size. Maybe removing daily averaged concentration information from the y-axis as this becomes evident from the figure text? Same applies to Figures 6, 7, 8, 9, 10, 11, 12 and 13.

Our response:

The font size in Figures 5 to 13 has been changed.

5. There are still multiple challenges with the language and it should be carefully checked by e.g. a native speaker or language services.

Our response:

The English language has been revised.