

Geosci. Model Dev. Discuss., referee comment RC2
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Comment on gmd-2020-432

Anonymous Referee #2

Referee comment on "urbanChemFoam 1.0: large-eddy simulation of non-stationary chemical transport of traffic emissions in an idealized street canyon" by Edward C. Chan and Timothy M. Butler, Geosci. Model Dev. Discuss.,
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The manuscript proposes an innovative a large-eddy simulation based chemical transport model to simulate dispersion and chemical transformation of nitrogen oxides from traffic sources in an idealized street canyon. This is an exciting topic, and the study is relevant, making the purpose of the research an essential work within the scope of the Geoscientific Model Development journal. This relevance is mainly driven by the fact that the proposed method could be an add value providing accurate outcomes regarding the simulation of crucial chemical transformations at street scale over urban areas. The paper is very well written and structured and the results are presented in a very clear, complete and well formatted way. Congratulations to the authors for the high quality of the manuscript. Nevertheless, in my opinion, some clarifications can be made. Overall the paper needs a carefully revision of the text to correct several typos along the manuscript.

General comments:

Line 259 – 260: Authors mention that “both the fine and coarse mesh results are in excellent agreement”. Can you please provide quantitative data to support this sentence?

Along the manuscript concentrations are provided in ppb, while for regulatory purposes in Europe we work in micro grams per cubic meter. Do you have any specific reason for working in ppb?

Regarding the differences between the simulations in stationary versus transient conditions, do you have any thoughts about which one is the most suited/ accurate? Can you highlight the potential advantages and disadvantages of both conditions?

The background concentrations are the total concentrations measured at the urban background stations. Is that right?