Geoscientific
Model Development
Discussions

Interactive comment on "Evaluation of high-resolution GRAMM/GRAL NO$_x$ simulations over the city of Zurich, Switzerland" *by* Antoine Berchet et al.

Anonymous Referee #1

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1. Overall quality of the discussion paper:

The quality of the scientific content of the paper is very good. The authors describe the methodologies and data sets they use. The structure is good and makes the paper easy to read. Analysis is conducted with different statistical tools and the data is analyzed with respect to temporal and spatial properties with comprehensive measurement data sets. The authors also acknowledge that the city of Zürich is using their model for air pollution control, which adds value to the scientific contents.

2. Individual scientific questions/issues:

Line 13: "crude presentation of traffic induced turbulence" - is this assumption? As it is

discovered at many stations at least other reasons should be mentioned here.

Line 93: I do not think the terminology "background winds" is right at his point, should probably be replaced by "large scale flow".

Line 120: Does the modeling setup consider a memory of the model with respect to temporal evolution? Are pollutants e.g. transported according to wind turns at consecutive time steps?

Line 125: Are the background values assumed constant values for the whole domain?

Line 206: It is not explained how the modeling system is obtaining the meteorological initial- and boundary conditions? Is there an interface to a larger scale- or global model?

Line 357: In the paragraph starting at this line, the authors describe that the model overestimates the observations, which is furthermore omitted by just taking the minimum concentration values within a certain distance from the receptor. As the comparison of concentrations in a model grid cell with point-measurements causes deviations by nature this method can be applied in order to have more realistic results. However I would recommend to describe this procedure already in the beginning of the chapter and also exchange the values in Table 2 by those ones. This is not a requirement for publication from my side but an advise to improve the paper.

3. Technical corrections: -