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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Regional climate model assessment of the urban land-surface forcing over central Europe" *by* P. Huszar et al.

Anonymous Referee #2

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General comments: The presented study is of good scientific relevance. The authors appear to be well versatile with the scientific literature on the subject, which is generally covered well in the manuscript. However, there are certain aspects of the study that need to be thoroughly revised prior to publication.

Specific major comments:

1. The major concern about the manuscript has been already raised in the interactive comment submitted by Dr. Trusilova. In line with Dr. Trusilova's comment, I would suggest that the authors re-conduct the statistical analysis of their results, since the majority of the examined variables cannot be assumed to follow a normal distribution, which should be the case when using the t-test. Non-parametric tests should be used

instead.

2. The number of figures in the manuscript should be significantly reduced. To my view, the current large number of figures does not help in highlighting the value of the study. Reducing the figures could certainly improve the quality of the manuscript. Reduction of figures could be achieved by means of removing certain variables from the analysis. For instance, the cross section diagrams could be removed, as well as one of evaporation/specific humidity. Selecting between monthly/hourly profiles for the examined variables could also help in reducing the figures and making the manuscript's message more clear to the interested reader. According to my opinion, hourly profiles are of more usefulness than monthly profiles, considering that the heat island effect is examined. In summary, the authors should re-visit their results and decide what is most important to show.

P18543, 2nd paragraph: I would suggest that the authors slightly extend the description of the heat island generation. Since their study is based upon this particular urban effect, a more clear and concise description is necessary. For instance, several aspects of heat island generation are not referenced, including evapotranspiration and anthropogenic heat.

Section 2.1: I would suggest that this particular section of the manuscript be revised. The presentation of the implemented model is somehow hard to follow, since several aspects of the adopted configuration are mixed up with information about changes in the model characteristics between different versions. I would propose to the authors to re-write this section, allowing for a more concise presentation of the implemented model and the adopted configuration (e.g. short description of the model, adopted configuration for the various physics processes, focus on the parameterization of land-surface processes).

P18548, L20-23: The authors state that the CORINE land cover database was used for deriving land use information, summarized in the definition of two urban land use

categories (i.e. urban, sub-urban). However, the procedure for deriving the land use information from CORINE is not described. For instance, the CORINE database includes several urban land use categories, such as continuous/discontinuous urban fabric, port areas, airports, and green urban areas, just to mention a few. What was the procedure followed for grouping and remapping the different CORINE urban land use categories into the two (urban, sub-urban) categories used by RegCM?

Specific minor comments:

The authors should try to reduce the use of the first plural ("we used", "we changed", etc) within the entire manuscript, since, to my view, it lowers the presentation quality of their manuscript.

P18543, L6-8: ".., which is a well-known phenomenon". Which is the "well-known phenomenon" referenced herein? This part of the sentence needs to be rephrased to be more clear and concise.

P18546, L6-11: The part of the paragraph describing the changes from verions 3 to version 4 of RegCM does not really add much to the manuscript and could be removed.

P18546, L20: "An improvement of the BATS scheme...". Improvement relevant to what? Needs rephrasing.

P18548, last paragraph: The comparison between the 10km and the 2km grid does not really add much to the manuscript. Instead, I would suggest using Fig.2 for presenting the overview of the used modeling domain, along with the urban coverage (Fig. 2, left) as resolved in the model simulations.

Figures 10-11-12: Adding error bars for the computed profiles would be helpful, allowing for a better interpretation of the data.

P18558, L20-24: It is stated that in winter, the impact of AHR is greater during the day. I would expect that AHR have a greater impact during the night, when temperatures are lower and central heating is extensively used.

Technical corrections:

P18543, L15: "... with a reduced intensity..". The term "efficiency" seems to be more appropriate than the currently used term "intensity".

P18543, L22: "impacts" instead of "impact".

P18544, L26: "aspects" instead of "aspect".

P18545, L12: "anthropogenic" instead of "anthropocentric".

P18547, L18: "... for a schematic representation of SLUCM" can be removed from the parenthesis.

P18548, L11: "A number.." instead of "Number..". "Several experiments" could be also used.

P18548, L15: "The BATS scheme..." instead of "The BATS..".

P18559, L6: "... as found by many...". This is not a proper statement. Please, rephrase.

Interactive comment on Atmos. Chem. Phys. Discuss., 14, 18541, 2014.