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Geoscientific
Model Development
Discussions

Interactive comment on "Development and evaluation of a building energy model integrated in the TEB scheme" *by* B. Bueno et al.

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General Comments: This is a useful modelling study in which the authors developed a new version of the Town Energy Balance scheme integrating a new building energy model in order to represent the energy consumption and the effect of air conditioning system. I find that the manuscript is very well written and did not need reorganisation. I have, however, many small to medium improvements that are in order.

Specific comments:

1. Page 2975 Line 3: The formation of the urban heat island phenomenon is not only due to the waste heat emission. I think it is better to reformulate this sentence in order to avoid any confusion for the reader.

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2. Page 2975 Line 10: The authors should specify which version of TEB is used: either the single-layer version or the multi-layer version coupled to the surface boundary layer scheme (CANOPY). In Figure 1, the authors present also the different CANOPY levels but without any explanation in the text.

3. Page 2975 Line 14: If you are using the multi-layer version of TEB, you should add also a reference for its evaluation. Hamdi R., V. Masson. Inclusion of a drag approach in the Town Energy Balance (TEB) Scheme: Offline 1-D validation in a street canyon. Journal of Applied Meteorology and Climatology, 47, 2627-2644, 2008.

4. Page 2975 Line 20: The authors present the strategy to improve the simple representation of building energy processes as described in Pigeon et al. (2008) but they did not show any comparison in the evaluation section between this simple method and the new method using BEM-TEB.

5. Page 2975 Line 25: The authors claim that the coupled scheme (CS) did not allow for coupling with atmospheric model and therefore they develop a new version of TEB integrating a new building energy model. However, they did not show in the evaluation section the effect of this strategy on the surface turbulent flux calculated by TEB which are passed to the lowest atmospheric level for the next time step.

6. Page 2976 Line 5: The authors did not show in the evaluation section the effect of taking into account passive building system and therefore confirm the benefit of adding this new feature.

7. Page 2976 Line 10: I think that the authors should add in the evaluation section: (1) a comparison between the old version of TEB and the new BEM-TEB, (2) evaluation of the effect of BEM on the surface fluxes calculated by TEB, (3) since BEM-TEB needs new parameters to be initialised, a sensitivity study of BEM-TEB to the specification of these parameters will be very important since many input parameters are subject to uncertainties.

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8. Page 2977 Line 2: The authors need to provide a comparison of the computer timing and resources needed for BEM-TEB as compared to TEB only.

9. Page 2980 Line 5: A reference is needed for this input.

10. Page 2987 Line 6: The authors should give the reader an explanation about the tendency of the SM to over-predict the cooling.

11. Page 2987 Line 6: In general and from a reader point of view figures and tables should be described and interpreted in more detail.

Technical corrections: 1. Page 2975 Line 7: Replace Town Energy Budget by Town Energy Balance.

2. Page 3002 Fig. 1: The SBL levels are not explained in the text. Are you using the single or multi-layer version of TEB ?

Interactive comment on Geosci. Model Dev. Discuss., 4, 2973, 2011.

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Interactive Comment