

## ***Interactive comment on “Validation of the Martilli’s Urban Boundary Layer Scheme with measurements from two mid-latitude European cities” by R. Hamdi and G. Schayes***

**R. Hamdi and G. Schayes**

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In the first place, we thank you for your review of our paper. We have tried to follow all of your requests. A point by point explanation follows below.

Comments: 1) Referee 2 said: The urban scheme estimates only urban values, so it cannot reproduce the UHI effect.

It is right, in the new version of our manuscript, we refer to the capability of the urban module of Martilli to reproduce the urban energy budget (UHI is removed from the text).

2)Referee 2 asked: Did the authors modify the TKE equation to account for the pres-

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ence of buildings (as it is done in Martilli et al. 2002)?

Yes, it will be mentioned explicitly in the new version.

3)Referee 2 said: The contribution of roof is missing in Eq. 2.

It is not true because in page 4267 line 7, it is mentioned that the floor contribution is the sum between the surface fluxes calculated from the street and the roof.

4)Referee said: please explain simulation set up for the Penmann-Monteith formulation used for the vegetated part.

In the new version of the manuscript a table is added in which we describe the input parameters for the Penmann-Monteith formulation used for the vegetated fraction.

5)Referee asked: What is exactly the temperature plotted in Fig. 8 for wall and road?

In the urban module of Martilli, the surface temperature for wall, roof, and road are resolved by integration across two street orientations  $84^\circ$  and  $174^\circ$  which are deduced from a city map (Table 1). One mean surface temperature is then calculated for each surface types. To compare these average surface temperatures calculated by TVM with observations, the average observed surface temperatures are calculated over all existing street orientations, because in the Escompte-UBL campaign, sensors were installed in different locations (not specially in street orientation  $84^\circ$  and  $174^\circ$ ) in the area around the tower (Lemonsu et al. 2004). For example, for roads, it is an average over 3 roads (2 North-South and 1 East-West) and for walls, it is an average over 4 walls (North wall, South wall, East wall, and West wall).

6)Referee said: Would a simulation with aspect ratio 2 improve the results?

We can not use 2 as an aspect ratio in the urban simulation, because it is a local value and it does not represent the area around the Marseilles city center. In fact, for the two urban sites, a circular area of about 250 m centered on the measurement point was defined and surface parameters (aspect ratio, fraction of vegetation, building height, ...)

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calculated.

Suggestions:

The aim of this manuscript is to validate the urban module of Martilli against measurements of surface energy budget, surface temperature, and canyon air temperature from two urban sites with vegetation cover less than 20%. So, to assess the influence of both urban and the new vegetated part of the scheme, we must validate the module over a location with higher fraction of vegetation. In a future paper (the second part of this paper), the urban scheme will be validated, in the case of the BUBBLE experiment, for two other locations: (1) urban location with higher fraction of vegetation (31%) and (2) suburban area with a fraction of vegetation equal to 53%.

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Interactive comment on Atmos. Chem. Phys. Discuss., 5, 4257, 2005.

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