

***Interactive comment on “Efficient urban canopy parametrization for atmospheric modelling: description and application with the COSMO-CLM model (version 5.0\_clm6) for a Belgian Summer” by Hendrik Wouters et al.***

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General comments: This paper developed a semi-empirical urban parameterization scheme, and applied it to COSMO-CLM model; the validation and sensitivity analysis were also implemented. Overall, this paper is well organized and easily to read; but it still need to be improved and clarified in some key points, so I suggest this paper should be published after a MAJOR revision. 1. This paper boasts to present a Semi-empirical URban-canopY parametrization SURY, which bridges the gap between bulk urban land-surface schemes and explicit-canyon schemes. But it lacks the comparison

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between the bulk urban schemes and explicit-canyon schemes. So, I question whether the SURY scheme is necessary or not. 2. As for SURY, why the author choses these parameters namely bulk albedo, bulk emissivity, etc. as the output of SURY, this need to be clarified. 3. Surface-Area Index (SAI) is a crucial important factor in this paper to reparametrize the ground heat transport parameters, but why SAI is chosen to do this? Why these parameters need to be reparametrized?

Specific comments: 1. Page 4 Table 1: I think these parameters should be reworked because they are varied with different areas. 2. Page 6 Equation 3: Please explain why use this equation to reparametrize the parameters. 3. Page 7 Equation 10 and 11: These equations also need to be explained. 4. Page 8 Line 22: In my opinion the  $z_0$  is the most important parameter in surface layer turbulent fluxes parametrization, so I think at least  $z_0$  should be added in the sensitivity analysis. 5. Page 29 Line 5: I think the author should provide a website of the models.

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