

## ***Interactive comment on “An urban trees parameterization for modelling microclimatic variables and thermal comfort conditions at street level with the Town Energy Balance model (TEB-SURFEX v8.0)” by Emilie Redon et al.***

### **Anonymous Referee #1**

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This paper presents a new urban tree parameterization for a urban canopy model (TEB). While there have been several tree parameterization schemes in the field, this study clearly pushes the modeling forward by incorporating ground vegetation-tree interactions. Overall the paper is well organized and written, but some modeling details are not clear enough.

Specific comments: 1) Section 2.2: the authors refer to Redon et al. (2017) for the radiative effects of urban trees. However, no ground vegetation is considered in Redon et al. (2017), so how do the trees modify net radiation for underlying ground vegetation

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(e.g., Fig. 1). The authors should present the surface temperature of ground vegetation at some time to illustrate the impact of trees. Please provide more information.

2) Section 4.1: Equation (10) accounts for the drag force of urban canyon in both horizontal and vertical directions. If I understand correctly, as shown in Fig.1, TEB model assumes a very long canyon as compared to the building width, which leads to large variations of vertical drags when wind directions change. Is the frontal index of buildings/trees considered in the model? Please elaborate.

3) Section 4.2: How is the transpiration rate of trees calculated? It seems that Equation 8 is missing in the paper. I love the consideration of leaf area density as a vertical profile to advance the ET modeling of trees. But why would the authors use a constant LAD then? At least some results with vertically varied LAD should be presented, especially in terms of the transpiration rate.

4) Section 5.2: The attenuation coefficients are sensitive to the locations of the trees and pedestrian. What are the locations of trees and pedestrian in this case? Also the authors separate trunks from the crown. Should the radiation from trunks be considered in this case?

I would like to comment more, especially when you have non-cylinder shape of crowns the mixing length below the trees may also be modified. But at this moment without sufficient details of the parameterization it is hard to assess the results.

Editorial comments: Abstract: ISBA model should be spell out at its first mention

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