Geosci. Model Dev. Discuss.,
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Interactive comment on "The Air-temperature Response to Green/blue-infrastructure Evaluation Tool (TARGET v1.0): an efficient and user-friendly model of city cooling" *by* Ashley M. Broadbent et al.

Anonymous Referee #1

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General: This paper introduces a promising approach to modelling urban temperature which could allow planners and consultants to access first-order results with little input data or computation time relative to most other models. My main reservation is that the assumptions and simplifications adopted here make the approach unsuitable for modelling spatial variations in micro-scale thermal comfort, which can vary dramatically even when air temperature variations are quite modest. This because of exposure to radiation and localized air flow, neither of which the current approach models with spatial precision.

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Discussion paper

Detailed: p7 lines 1-3 - "...walls and ground surfaces have similar longwave emission relative to the sky, and... solar radiation receipt can be approximated by SVF, on average. This simplification means that the model makes no distinction between lit and unlit buildings walls..." It also makes no distinction between lit and unlit ground surfaces, or pedestrians within an urban space. This should be noted as well. p12 lines 3-4 - "Utop is estimated at the top of the UCL based on Uz using a logarithmic relationship." This seems to be problematic, because the constant flux layer in which a logarithmic wind profile can be found is separated from the UCL by a Roughness Sub-Layer. Extending the logarithmic profile downward through the RSL can lead to unrealistic wind speeds. This is significant because the canyon wind speed, and in turn the surface conductances and canyon air temperature itself, are based on Utop (as described in Eqs. 16-18).

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