

General

The manuscript “Importance of radiative transfer processes in urban climate models: A study based on the PALM model system 6.0” investigates the relative importance of each radiative transfer process in simulating the energy processes in urban boundary layer. The method of this study does not consider the radiative transfer processes as a bulk process, instead it brook it down into several processes and checked the effect of each individual process, which I find it novel.

This paper would be of interest for a wide range of GMD readers who are interested in radiative heat transfer, especially the special issue “The PALM model system 6.0 for atmospheric and oceanic boundary-layer flows: model description and applications in urban environments”. However, I think there are two main issues in this paper which should be first explained by authors.

I listed here these two issues for authors so that they may consider them to improve this manuscript, if they find them helpful.

Issues

- This study depends mainly on the Stepwise parameterization Method (SPM), which is a bottom-up approach to compose a Radiative Transfer Model (RTM) out of the sub radiative transfer processes. Although this method is very interesting, authors need to justify the logic behind the order of adding the sub radiative transfer processes. For me, the current order is somehow random. They should comment on how the results may vary if this order is changed.
- Authors compared each step with the case RTM_08 and claimed that this case is a reference case. Since this case is not a physical measurement nor it a validation data, it can not be reference case. This may confuse readers. So I suggest that authors rename it and explain explicitly that this is the expected high accurate model (best available solution in the model PALM).