

## ***Interactive comment on “Calculating human thermal comfort and thermal stress in the PALM model system 6.0” by Dominik Fröhlich and Andreas Matzarakis***

**Dominik Fröhlich and Andreas Matzarakis**

dominik.froehlich@mailbox.org

Received and published: 4 November 2019

Dear Referee #1:

The authors want to express their gratitude for your detailed and valuable comments. Please find your comments addressed in detail below.

1: The mean radiant temperature is mostly determined in the radiation module, not the biometeorology module. This is while it was considered out of scope for this manuscript. The authors, however, do see the relevance of the parameter. A description therefore will be added to the methods.

C1

2: All input parameters are determined for the center of the voxel, that is closest to 1.1m above ground level. The cell level is determined in the initialization of the module.

3: The limitation of the regression mostly arises from spatially resolved wind speed being lower than 0.5 m/s in 10m height. The wind speed in 10 m above ground level is determined from extrapolating the wind speed at the cell center level closest to 1.1m above ground level (see above) by applying the wind profile from the original UTCI determination (Havenith, UTCI clothing). The workarounds mentioned in the manuscript are those published by Broede et al. 2012.

4: This arises from iPT is integrated into the BiometMod, but not correctly called from the agent module in version 6 that is the basis of this manuscript. We will check if it is suitable to show results anyway or remove the index from the methods.

5: The parameters listed there are modifications to the original generic test dataset provided at <https://palm.muk.uni-hannover.de/mosaik/wiki/internal/testing>. What parameter is unclear from your point of view?

6: For keeping the manuscript at a reasonable size only two examples are presented here. However, the entire dataset with input and output is published along with the manuscript and can be found (as stated in the manuscript) at <https://zenodo.org/record/3433720>.

7: Page 10 line 23 reads "model. The general statistics of the dataset is provided by Table 4. The output generated by the biometeorology module was". Is this the line you are referring to?

8: Page 10 line 26 was intended as some introductory sentence rather than as a statement. The authors agree that this could be misleading. It will be modified to e.g. "Results for the test case (e.g. Figures 4 - 6) show the changing thermal conditions over the day."

9: Incident wind is from 270° with 1.0 m/s. Added to the respective figures. Thanks for

C2

the hint!

10: Yes. Also added to the methods.

11: This manuscript is about the calculation of thermal indices within the biomet module in PALM. The assessment of the input parameters provided by PALM and its other modules is not in scope of the manuscript (and can hardly be done by the authors as those parts are by different developers). Neither Envi-met nor SOLVEIG can calculate the thermal indices PT, PET and UTCI what makes them not relevant for this manuscript.

12: The module was developed in the course of a German project. Therefore the most important indices for Germany are included. However, the module is open source and can easily be extended by the users favorite thermal index.

13: For information about the radiation schemes in PALM please see the palm documentation at <https://palm.muk.uni-hannover.de/trac/wiki/doc/tec/radiation>.

14: This manuscript can not assess the results of the PALM model core or the radiation module that are used as input parameters. This is up to the respective module authors. The manuscript is about the thermal indices only.

15: For the models are of different types (SkyHelios is a diagnostic model) and resolutions, difference maps can hardly be produced here. They will also hardly help as the maps are shown to compare the spatial patterns and not individual values.

16: Section 3.2 is definitely neither trivial nor can it be removed. It is the closest possible to a direct comparison that is required to assess the quality of the thermal indices calculated. The location the input values were recorded is irrelevant as they are exactly the same values for the biometeorology module, the RayMan module and the VDI versions of the indices. Also Tmrt is the very same row of data for all three models.

17: Matzarakis is not a (co-) author in 28 of 55 references (50.9%). The authors

C3

however agree that this can be reduced and will remove some of the references.

---

Interactive comment on Geosci. Model Dev. Discuss., <https://doi.org/10.5194/gmd-2019-202>, 2019.