

Dear Editor and Reviewers,

We sincerely appreciate the time and effort the editorial board and reviewers have dedicated to evaluating our manuscript for the second time. Below, we provide detailed responses to the comments. We have also added a more detailed description of the labels shown in Figure 4. To enhance contrast, all maps presented in Figure 6 were visualized in ArcGIS Pro using a  $\pm 2$  standard deviation stretch. In addition, the reference list has been revised to comply with the journal's formatting requirements.

We look forward to your feedback on the revised submission.

Best regards,

Yanfei Li

On behalf of all co-authors

Below you will find:

- The reviewers' comments in black, normal font
- Our answers are in blue, normal font

### Comments on “egusphere-2025-1595”

The authors provided a thorough revision of the manuscript and detailed responses to the review comments. It is clear that significant progress has been made in addressing the major concerns, also clarifying the UAV thermal data processing and calibration procedures. As such, the manuscript has improved substantially in terms of methodological transparency and overall clarity.

Regarding the thermal calibration, I highly appreciate the two-step approach involving reference panels and emissivity correction based on land cover classification which is state-of-the-art. This addresses the core issue raised in the initial review. However, to fully substantiate that the calibration with reference panels was actually implemented during each UAV flight, I would strongly recommend including supporting evidence in the supplementary materials at this stage, by including e.g.:

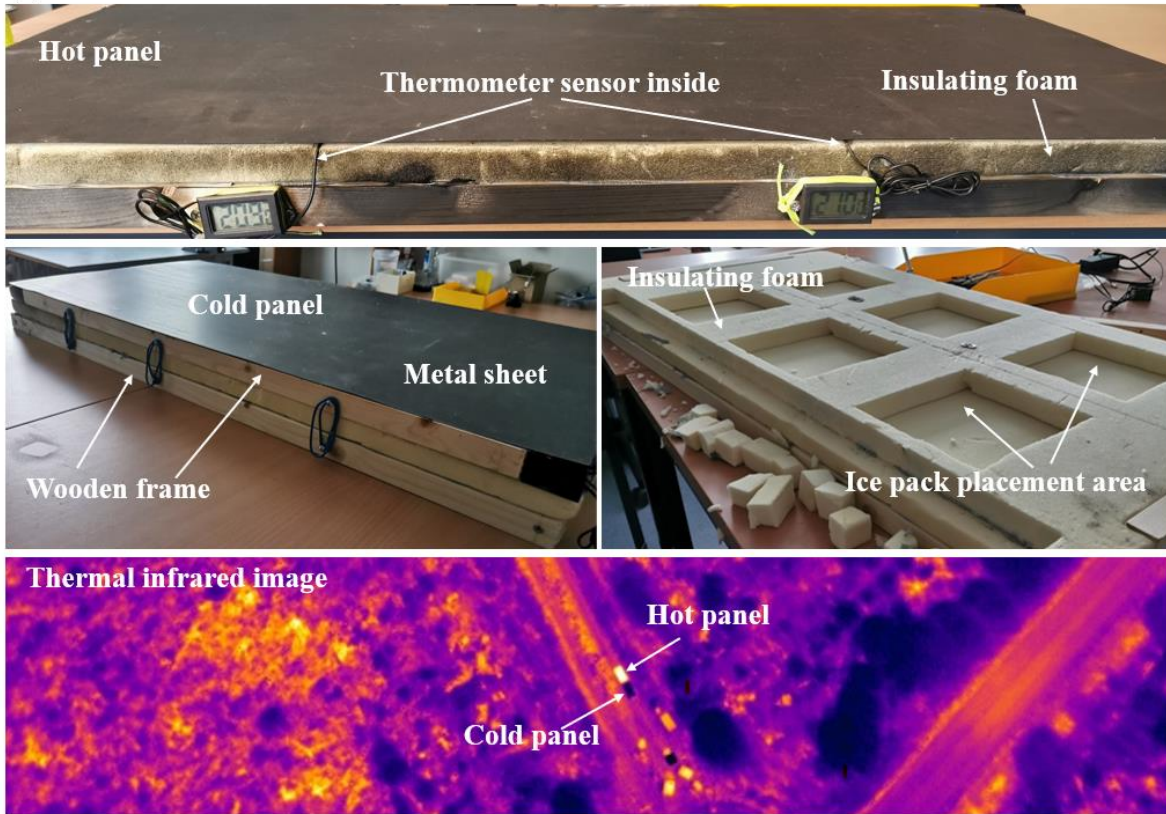
- A plot or table showing the linear regression/calibration curve used to correct the raw LST data, including sensor-measured temperatures of the panels and the corresponding raw pixel values, as has been provided with Figure S2 for modelling soil temperature. This will substantially increase transparency.

- An optional photograph or thermal image showing the setup and placement of the hot and cold reference panels on the ground during one of the flights.

These additions would greatly enhance the credibility and transparency of the calibration procedure. Including them in the Supplement would allow readers and reviewers to verify that the calibration was actually executed with success as described. Aside from this remaining point, the revised manuscript is publication-ready.

We thank the reviewer for the positive comments and valuable feedback. We have added a plot showing the linear regression curve and the corresponding equations used to correct the raw LST data across different dates in the supplementary material (Figure S2b). In addition, we have included images illustrating the setup and placement of the hot and cold reference panels on the ground during one of the flights (i.e., 19 July 2023) in Figure S1a. The two graphs are also shown below:

(a)



(b)

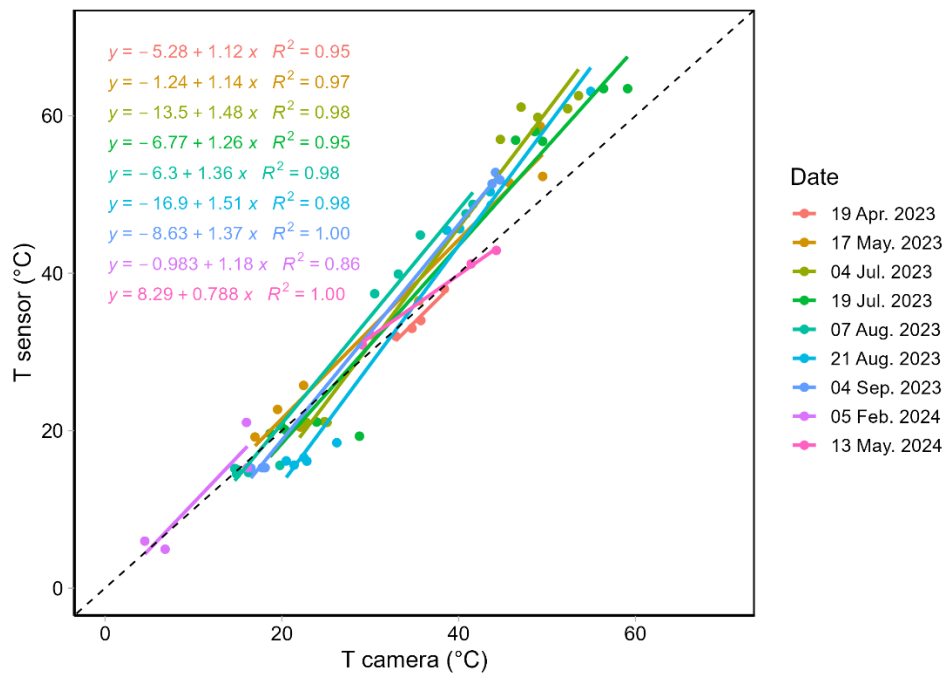


Figure S2. Experimental setup for thermal infrared data collection and an example thermal image showing the hot and cold reference panels on 19 July 2023 (a). Comparison between thermometer-measured and camera-measured panel temperatures across different dates (b).