

Atmos. Meas. Tech. Discuss., referee comment RC2 https://doi.org/10.5194/amt-2020-500-RC2, 2021 © Author(s) 2021. This work is distributed under the Creative Commons Attribution 4.0 License.

## Comment on amt-2020-500

Anonymous Referee #3

Referee comment on "Use of thermal signal for the investigation of near-surface turbulence" by Matthias Zeeman, Atmos. Meas. Tech. Discuss., https://doi.org/10.5194/amt-2020-500-RC2, 2021

The manuscript presents a novel approach to combine distributed temperature sensing and thermal imaging instruments to study near-surface turbulence. The new technique enables detailed spatio-temporal analysis of both scale and shape of temperature structures and opens new opportunities to advance micrometeorological research. The manuscript is well written and provides a detailed overview of various aspects related to the application of the new technique. In my opinion, it might make the manuscript more accessible if the data science techniques would be briefly explained in the main text (and not only in the appendix). It would be also helpful to explain the meaning of variance events since they are at the centre of a part of the analysis. What is their physical meaning? I would also find it helpful if the potential of this technique for long-term monitoring would be discussed. It appears if the instrumentation was only deployed during an intensive measurement campaign. How realistic is it to deploy these instruments yearround?

Please see below some comments:

**Line 17:** Please clarify "about additional details contained in such data". What were the specific research questions that were addressed in these studies? It would also be informative to further elaborate to which research questions the presented new measurement techniques could contribute.

**Line 128:** Which criteria were applied to determine if eddy covariance flux computations were "acceptable"?

Line 156: Please elaborate how these findings "suggest an interaction between scales".