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Comment on amt-2021-428

Marianna Nardino (Referee)

Referee comment on "Quantifying the coastal urban surface layer structure using distributed temperature sensing in Helsinki, Finland" by Sasu Karttunen et al., Atmos. Meas. Tech. Discuss., <https://doi.org/10.5194/amt-2021-428-RC1>, 2022

The present work regard the use of one of the most promising new techniques for measuring the structure of the surface layer: the fibre-optic distributed temperature sensing (DTS), which has the potential to provide to study thermal turbulence with high spatial and temporal resolution.

The authors after a detailed description of the methodology used and the calibration of the DTS system present the results obtained during two meteorological events: a study of the erosion of a near-ground cold layer during the passage of a warm front, and a comparison of the near-ground thermal structure with and without the presence of a sea-breeze cell during springtime convective boundary layer development. An eddy covariance system was used to compare and validate the DTS data.

The results demonstrate the utility of DTS measurements in revealing the internal surface layer structure, beyond the predictions of traditional surface layer theories.

The possibility of using this system allows for high frequency and high spatial resolution temperature profiles and to improve surface layer theories and parameters.

The limits and errors in using this system are widely and well reported and I think it can be published in the present form.