

Interactive comment on “Fiber optic distributed temperature sensing for the determination of the nocturnal atmospheric boundary layer height” by C. A. Keller et al.

Anonymous Referee #1

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The article presents a new and practical way to observe atmospheric temperature profiles. It is concise and well written and should be published. I have just some minor comments the authors may want to address.

1) The objective (measure height of nocturnal ABL) is relatively modest and it would seem that the rich dataset could be used for further analysis. It is not explicitly stated but I assume that the method is used during the night because radiation during the day would disturb the measurements. Although short wave radiation would basically be zero during the night, this clearly does not hold for long wave radiation. So it would

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be good to clarify what the role of the long wave radiative balance of the fiber has on the measured temperature.

2) Both ends of the cable were on the ground. It is a pity that the return cable was not inserted into the temperature bath as well. Not sure why this was not done because it would have allowed to correct with a slope and an offset, as is preferable given the differential attenuation of Stokes & anti-Stokes along the cable. Instead, a comparison is made between the up and down parts of the cable. The authors give a high correlation. What would be good to see is if this correlation varies along the cable. If an offset would not have been enough, one would expect a higher correlation between points that are close to each other along the cable (those close to the balloon) than between those that are far from each other along the cable (those close to the ground). A graph of R vs height would show that. This would be helpful to see for future experiments, whether the return cable should also go through the temperature bath.

3) Finally, a barometer is used to determine height because of the wind drag. Is this wind drag accounted for when the measured temperatures are given their heights? Does this matter at all or is it in the order of less than one meter? (If so, one might in the future as well use the cable to measure height. If not, how does one correct?)

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