

## ***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 #2**

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The paper describes a new method to measure temperature profiles in the lowest part of the atmosphere (<100m). It utilises the Raman signal backscattered within a galls fibre which was hang below a tethered balloon. The method was already used in aquatic applications, but was not used for atmospheric measurements before. The results of the temperature measurements are compared to simultaneous temperature measurements at the ground and to Radon measurements as an indicator for the atmospheric stability. In general the paper is well written, and the results are well presented and discussed. The paper is well appropriate for AMT and should be published after minor corrections.

Page 2725, line 28/29: This sentence is not clear to me. Why has it been difficult to obtain synchronous profiles from tethered balloon observations?

Page 2726: Some more general information on the method would be helpful. In particular it should be briefly discussed what determines the spatial and temporal resolution.

Page 2727, line 3: what is meant with 'o.d. 0.7g/m?

Page 2727, line 16: what determines the spatial resolution? Maybe also a reference should be given here.

Page 2727, line 25: how is the response time determined? What is the trade-off between response time and signal to noise ratio (or temporal/spatial resolution)?

Page 2729, line 18: According to the Beer-Lambert law the intensity should decrease exponentially (and not linear). Of course, dB is a logarithmic quantity. But one should be careful with the wording.

Page 2729, line 19: indicate => indicates

Page 2731, eq. 1: it seems that there is an error in this equation. Maybe there is a 'delta' missing at the left side?

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Interactive comment on Atmos. Meas. Tech. Discuss., 3, 2723, 2010.

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