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Atmospheric Measurement Techniques Discussions

Interactive comment on "Two fast temperature sensors for probing of the Atmospheric Boundary Layer using small Remotely Piloted Aircraft (RPA)" *by* N. Wildmann et al.

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Many thanks for the detailed review. In the following I will comment on each point. The referee comments will be repeated in italic before the answer.

1. *line 35: inconsistent use of upper and lower case for radar, lidar, sodar RASS*
   In the complete text, the terms will be changed into radar, lidar, sodar in lower case and RASS in upper case. Talking about the specific instruments for comparison in this study, the terms sodar / RASS and wind profiler / RASS will be

   used to account for the fact that the radio acoustic sounding system makes it possible to measure temperature with the instruments.

2. *caption of table 1: add "for the determination of turbulent heat fluxes" at the end of the line*
   Will be done in a revised manuscript.

3. *line 149: I suggest to use consistently RPA/RPAS instead of UAV*
   The term RPA is will consistently be used in a revised manuscript.

4. *figure 3: hard to read, in particular the very small letter size, I suggest to increase the figure or at least the fonts*

   The font size was increase, see figure 1.

5. *line 216: wrong hyphenation: "Messelectronic"*
   The word "Messelectronic" in the company name will be put in a latex mbox to prevent hyphenation in future.

6. *line 377: the statement of 10 m uncertainty/variation does not match the 2 m altitude stability stated before in line 349*
   Here, a bias causes the error. In the previous occurence of altitude accuracy, the precision was meant (deviations from the mean). The term will be changed and in the first paragraph it will be added that a bias can be up to 10 m.

7. *figs 10/11: The measurements of the Sodar show a distinct deviation in lapse rate compared to the other systems. If these data (that are basically not really used in the following) remain in the figures, the behavior has to be shortly discussed.*
   For the late afternoon profile, an adiabatic stratification is found with little heating from the surface. This situation can lead to a bad signal to noise ratio of the sodar / RASS and therefor a lapse rate that is too high. In the morning profile, especially

the measurement at highest altitude is off. Since it is the highest measurement point of the sodar with an acceptable quality indicator, maybe even this point should be left out. Nevertheless, we consider the data valuable to fill the gap between tower and wind profiler / RASS.

8. *figs 10/11: symbols and/or color for "Tower" or "Profiler" should be changed to enable a better distinction between the corresponding data points*
   The symbols were changed. See answer to referee 1.

9. *lines 449-454: here is one example of a sentence that is rather long and complicated to read and needs to be rephrased: "The fact that FWPRT measurements and also the pure thermocouple signal do not show this significant radiation errors shows that with fine wires of the diameter used in this system, at an airspeed of 20 m s−1, hardly any radiation error is to be expected."*
   Rephrased sentence: "Both fine wire sensors - thermocouple and FWPRT - do not show a significant sensitivity to radiation at the given airspeed of $20\ \mathrm{m\ s^{-1}}$. This is a good indication that radiation errors can be neglected for this type of sensor."

10. *line 474: remove blank after "temperature"*
    Will be done in a revised manuscript.

11. *line 685: "statistical measure" or "statistical parameter" instead of "statistics"*
    The term statistical measure will be used in future.

12. *line 687: insert "," after "flow"*
    Will be done in a revised manuscript.

Interactive comment on Atmos. Meas. Tech. Discuss., 6, 3089, 2013.

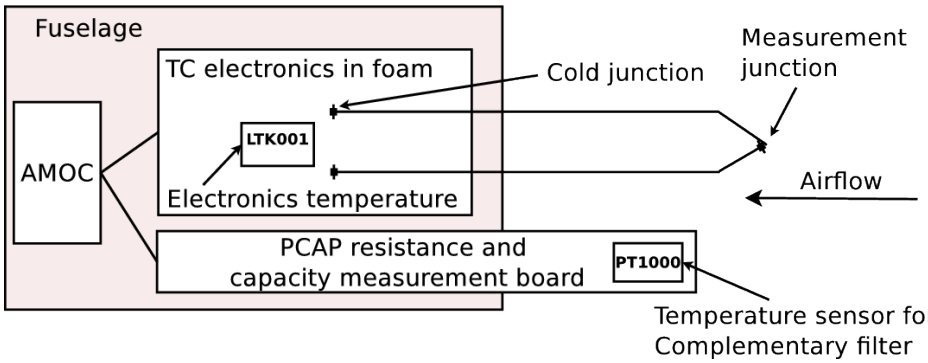

Fig. 1. Schematic drawing of the complete thermocouple measurement strategy.