

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.

Anonymous Referee #1

Received and published: 21 May 2013

This is a report on performance of two small temperature sensors designed for the small remotely piloted aircraft (RPA) containing standard, but necessary scientific work. There is a vast pile of papers about airborne temperature measurements. Most of them are, however, consider heavy piloted aircraft, not accounting for specific requirements of small and cheap remotely piloted airborne vehicles. The authors describe and evaluate two simple, compact, light and cheap temperature sensors designed for RPA applications. They use a resistance wire Pt1000 and a thermocouple as sensing elements. Technical description of the sensors is adequate, the same concerns experimental verification of performance. The paper can be accepted for publication after

C1019

several revisions and clarification. The only reason I put "major revision" suggestion instead of "minor revision" is point 5 below: I would like to see a somewhat deeper discussion of the frequency response.

1. p. 3092, section beginning in line 4 from "Smaller..." Please provide references to the statements concerning radiosonde temperature sensors.
2. p. 3096, Notice that Haman (1992) was using type E thermocouple as a temperature sensor on slowly flying powered glider.
3. p. 3099, last para, Test flight were performed in temperatures lower than the calibration range. I know that this is not an issue here, but should be commented.
4. p. 3100 last para, Please comment on accuracy of humidity measurements and conversion to virtual temperature.
5. p. 3104, "From the spectra" ... I do not take the argument that worse spectral resolution of PRWR sensor results from the wire diameter. In my opinion the effect is heat transfer between the support (of larger heat capacity) and the wire. Fig. 5 shows that there are at least 10 points of contact between the wire and support. For discussion of heat transport from support consult Payne et al. (1994) and Haman et al. (1997) and references therein.
6. Fig. 1. Some acronyms are not described and their meaning is not straightforward.
7. Fig. 9. It seems that thermocouple measurement error has a trend. Any comments?
8. Figs. 10. and 11. Symbols (Tower, Profiler, Sodar) are hard to distinguish.
9. Fig. 12. No description of solid/dashed lines. Their meaning can be deduced from the text, but the description should be added.

References

Haman, Krzysztof E., 1992: A New Thermometric Instrument for Airborne Measure-

C1020

ments in Clouds. *J. Atmos. Oceanic Technol.*, 9, 86–90.

Haman, Krzysztof E., Andrzej Makulski, Szymon P. Malinowski, Reinhold Busen, 1997: A New Ultrafast Thermometer for Airborne Measurements in Clouds. *J. Atmos. Oceanic Technol.*, 14, 217–227.

Payne, G. A., C. A. Friehe, D. K. Edwards, 1994: Time and Frequency Response of a Resistance-Wire Aircraft Atmospheric Temperature Sensor. *J. Atmos. Oceanic Technol.*, 11, 463–475.

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

C1021