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Atmospheric Measurement Techniques Discussions

Interactive comment on "Fast-response high-resolution temperature sonde aimed at contamination-free profile observations" *by* K. Shimizu and F. Hasebe

Anonymous Referee #2

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Review on " Fast-response high-resolution temperature sonde aimed at contamination-free profile observations" by K. Shimazu and F. Hasebe

General comment:

The paper describes a newly designed radiosonde package for improved temperature measurements for altitudes up to 30 km. The main focus of this work is on the reduction of artificial spikes and other contaminations by radiation effects in the temperature measurements. The paper deals with an important measurement problem of stratospheric in-situ temperature measurements and carefully describes possible solutions.

The paper is mainly well written; a few suggestions are given below. I recommend this paper for publication after the following minor comments are considered.

Minor comments:

Title: “contamination-free” is maybe too strong since you can only reduce the contamination but no measurement will be free of any contamination.

Abstract: Line 1: “ultra thin” is not very precise; there are other temperature probes with much smaller diameter – I suggest deleting the word “ultra” and providing numbers.

Line 12: “noise” is misleading and suggests something like uncorrelated fluctuations/errors.

Line 18: to suggest that the new probe should serve as international standard is going too far

Introduction:

Page 3295, line 5: “radiatively active minor constituents” – what do you mean?

Page 3295, line 24: change “corrections” with something like “influence” or so

Page 3295, line 29: again I would delete the part where the new probe is suggested as a new standard

Page 3297, line 6: “atm” is no SI-unit; the mentioned tick marks in the label of Fig 1 are non-visible in my copy.

Page 3297, line 27: the second part of this sentence is not clear to me. Why can a fast-response sensor minimize corrections? Do you mean that the influence of radiation on a fast response sensor is small and corrections can be avoided?

Page 3298, line 2: please specify the “upgrade” and how this upgrade can reduce the radiation influence on the temperature measurement. (I think with “correction” you mean “influence” here?)

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Page 3298, line 13: What is a “good agreement”?

Page 3298, line 23: Can you provide more details about how the data of conventional radiosondes are processed?

Second part of Section 3: This part is a little bit confusing to me since the authors jump a little bit between own work and “standard radiosonde measurements”.

A schematic of the setup could help to understand the set-up and situation described in the last part of Section 3.1.

Section 3.2 and 3.3 are very convincing and the examination of possible effects on the temperature measurements was done very carefully.

Section 4, page 3303, line 1: again the word “radiation correction” is misleading; can you really correct for the 0.4 K or is it just the error in the measurement due to the radiation effect?

Line 17: why not using a simple de-spiking algorithm such as a running median, which can remove the spikes? Of course this is only possible if you have high-resolution data (as yours) that can resolve the spikes.

Page 3304, line 4; again I would avoid the word “noise” – maybe the word “perturbations” is better in this context.

Interactive comment on Atmos. Meas. Tech. Discuss., 3, 3293, 2010.