

Interactive comment on “Fine-scale turbulence soundings in the stratosphere with the new balloon-borne instrument LITOS” by A. Theuerkauf et al.

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Referee's comments on the manuscript

"Fine-scale turbulence soundings in the stratosphere with the new balloon-borne instrument LITOS"

by Theuerkauf et al.

C1544

The paper provides a thorough report on a novel application of a hot-wire sensor to obtain turbulence data in the stratosphere. The paper is well structured and covers all concerns to be considered in such balloon-borne measurements. Since this is to be a contribution to a journal on measurement techniques I miss a few sentences whether this instrument was designed and built from scratch by, or for the authors, or whether it is a commercial instrument modified and calibrated for the environment during a balloon launch. Did the early measurements by Barat et al., which did not have the present resolution, also make use of a hot wire anemometer or some other device?

Beyond that I only have a few comments mostly concerning typos or language:

p. 3456, line 9: I would use "can be launched from any ..." (not "at any")

p. 3457, line 28: the plural of aircraft is aircraft (not aircrafts)

p. 3458, line 9: "and up to now stratospheric ..." (not "up to know ...")

p. 3459, line 3: "which is 5 m in diameter ..."; this should probably be 5 μm ?

p. 3460, line 2: "the balloon follows the ambient ..." (not "is following")

line 26: again, presumably the diameter is 5 μm , not m

line 12: "the determination of the heat loss implies the definition ..." (not "imply") somewhere on this or the following page should be mentioned that temperature and density of the ambient has to come from "somewhere" (another sensor on the same payload or from a model)

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p. 3464, line 8: "we were safely below this limit ..." (not "are sufficinetly below")

p. 3465, line 5: "The extent of these layers ranges" (not "extent of these layer range")

line 6: "but normally does not exceed 500 m." (not "do not exceed")

p. 3466, line 4: "the transition to an m-7 slope" (not to "a m-7 slope")

lines 23, 24: as above

p. 3467, line 7: the unit of energy dissipation is mW/kg (not just mW)

p. 3469, line 9: "has been significantly improved" (better than "strongly improved");
"the sounding by" (better than "the soundings from")

line 17: "dissipation rate of 10 mW/kg and an inner scale" (not "dissipation rate 10 mW
and a inner scale")

line 19: "are planned to obtain a climatology" (better than " to get a climatology")

p. 3472, line 4: "raises the question" (not "rises the question")

p. 3479 "is omitted due to unresolved ambiguities" (I presume this meant)

Generally I found the correct, but rather uncommon word "therewith" in many places; it
might be replaced by some other words such as "thereby", etc. In the appendix where

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the theory of heat transfer is explained usually *fluid* is used, although in the present
case it concerns *gas*.

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