Atmos. Meas. Tech. Discuss.,
doi:10.5194/amt-2016-266-RC1, 2016

Atmospheric Measurement Techniques Discussions

Interactive comment on "Quantitative analysis of the radiation error for aerial coiled fiber–optic Distributed Temperature Sensing deployments using reinforcing fabric as support structure" *by* Armin Sigmund et al.

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Received and published: 23 December 2016

General

Nice paper that produces a very comprehensive way to correct for the effects of radiation and support structure on atmospheric DTS measurements. As such, it is a very useful addition to the rapidly growing literature on atmospheric applications of DTS. Especially the quantification of the conductivity error, and the fact that for the presented construction this turns out to be be negligible, are important.

Major comments

None.

Minor comments

In general, the authors seem to dislike the use of commas. Commas are not only known for their life saving properties ("Let's eat, grandma.") but they also improve readability. Especially after introductory clauses, commas are very useful. Sometimes, the authors use them there (p2 l15, p3 l1) but I would suggest to put them throughout (p2 l14, p2 l30, etc)

p2 l1: "the DTS"

p2 l16: Remove colon.

p2 l31: Remove colon.

p3 l28: There is a slight temperature dependence of Stokes as well.

p 4 l5: Should be "reinforced"?

p 4 l5: Please provide make and type of the fabric or at least a description such that we can purchase a similar fabric (material, size of skeins, size of mesh, ...).

p4 l13: Was this a tightly packed cable? Did it contain tensile strength elements such as Kevlar? The reason this is important is that later on you make the assumption that the cable is homogeneous. In addition to the actual glass fiber, were there other elements? Also, was the fiber bend-tolerant?

p 5 l19: "in the laboratory" is a bit confusing. I assume you mean that at that sampling rate, the laboratory set-up gave an error of 0.04 K.

p 5 l25: Remove colon.

p 5 l32: That seems to be very inaccurate! You are shooting from two sides so I would have expected something much better. Is there any structure in this error or is it completely random (cannot be completely random as the order of measurements

would be reversed etc). Any idea where this comes from? Did you use the speed of light assumed by the Oryx?

p8 l7: 10 should be 19

p 9 l5: Why is U assumed the same as you measure wind speed at both sites?

p9 l21: "predominantly" (interesting internet discussion on whether "predominately" is also ok, but why irk?)

p10 l10: Not sure I can agree 100%. In case of very low wind speeds, free convection will start to occur. It is not difficult to imagine that happening along the sunny side of the support structure. Eq 8 is then no longer the correct one to use. It would go too far to include this but a caution concerning free convection would be good to include here, such as "as long as free convection can be ignored."

p10 l25: It could very well be that your temperature measurement over the lake is better than over the meadow. The aspirated psychrometers may not be as great on sunny days as we often assume although one would then assume the model to underestimate the measured psychrometer values. More a loose remark than a recommendation.

p13 l2: It would be so much nicer to simply include the data set as additional material or as quotable dataset in a data depository.

Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2016-266, 2016.