

Interactive comment on “Wind speed measurements using distributed fiber optics: a windtunnel study” by Justus G. V. van Ramshorst et al.

Anonymous Referee #1

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The study of van Ramshorst et al. investigated the actively heated fiber-optic (AHFO) technique and estimated its accuracy and precision under controlled airflow conditions by comparing to a three-dimensional ultrasonic anemometer. A very valuable error prediction equation for the wind speed measurements at different heating rates were developed, as the heating rate can be a limiting factor for long cables. This equation is also accounting for averaging over space or time which further increases precision. They conclude that AHFO measurements are reliable in outdoor deployments when correcting the measurements for directional sensitivity with a ultrasonic anemometer, choosing the right heating rate and spatial or temporal averaging. Distributed temperature sensing (DTS) measures temperatures along a fiber-optic cable spatially

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continuously and can be used in various fields. Especially for atmospheric research this technique offers new insight into the temperature field and thus was implemented in many studies. By using the AHFO technique, wind speed measurements can be added to the system. As the community using the DTS and AHFO technique is growing, the study of van Ramshorst et al. is important for users to be aware of the accuracy, precision and limitation of this technique. Hence, the paper is valuable for our community. The introduction to the determination of wind speed is nicely done, however, I think it can be organized more reader friendly. The overall structure of the paper is logic, but could be reorganized and shortened. In my opinion some figures are redundant. The development of the error prediction equation needs clarification. I could not differentiate results from discussion. Further, I am missing some turbulence statistics of the wind tunnel (friction velocity, velocity aspect ratio, turbulence intensity in different directions,...) to give an estimate how representative the turbulence within the wind tunnel is to outdoor turbulence. I recommend to accept the submitted manuscript after major revisions. I attached a supplement with further details.

Please also note the supplement to this comment:

<https://www.atmos-meas-tech-discuss.net/amt-2019-63/amt-2019-63-RC1-supplement.pdf>

Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2019-63, 2019.

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