

Interactive comment on “Technical note: using Distributed Temperature Sensing for Bowen ratio evaporation measurements” by Bart Schilperoort et al.

Anonymous Referee #1

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The paper validated temperature measurements in BR-DTS method and introduced the use of screens in reducing the impact of solar radiation on temperature measurements in an experiment over a forest. Sensible and latent storage are also considered in energy balance in this paper. The aim to better represent sensible and latent heat flux is within the scope of HESS and the usage of screens is new. However, there are some inconsistencies and ambiguous demonstrations in this paper.

Page 1 Line 2, “now allows its use in hydrological”, should be “allow” rather than “allows”.

Page 2 Line 1, “distributed temperature sensing technology (DTS)”, DTS is the abbrevi-

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ation for “distributed temperature sensing” rather than “distributed temperature sensing technology”.

Line 1-2, “The precision and spatial resolution now allows its...” should be “allow” rather than “allows”.

Line 11-12, “It also has a resolution of 0.014 K for 15 minute averages, allowing for very small temperature gradients to be measured”, please give reference for this sentence.

Page 5 Line 23-24, “second cable with a diameter of 3 mm was used to study the effects of solar radiation”, however, the 3 mm diameter fiber temperature is not shown in this paper. What is the temperature difference between the thicker and thinner fiber?

Page 7 Line 5, “The cables were shielded from direct solar radiation using screen gauze secured onto PVC rings”, please describe more about screens, e.g. materials, size and manufacturers. These are quite important as different screen gauzes may lead to different shielding effects.

Line 23, “The biomass heat storage change and the photosynthesis energy flux were not measured”, so GP in equation (1) and dQB/dt in equation (14) should be removed as they are not considered here.

Page 8 Equation (18) is inconsistent with equation (4), which one has been used?

In equation (18) and (19), how many vertical points have been used in calculating Bowen ratio? In Euser et al 2014, it was shown that multiple measurements will lead to better results than two data points.

Line 14-15, “the DTS measured temperature and vapour pressure is used”, “are” rather than “is” should be used.

Page 10 Line 3-4, “the 46 m reference sensor is compared to the cable temperatures at 44 m height”, there will be some difference between the temperature at 44 m and 46 m since a log profile used here. One way to address this issue may be extrapolating

the 46-meter-high temperature of DTS using the 44-meter-high temperature and log profile.

Line 6-7, “This error is a deviation of up to 3 K from the reference sensor temperature”, what is the time of averaging in calculating this deviation?

Page 12 Figure 5. The correlation between Bowen ratios measured by DTS and EC is shown here. It may also help to show the correlation between sensible heat fluxes measured by DTS and EC to compare with figure 8 in Euser et al 2014.

Page 14 The RMSEs in Figure 6 and 7 are large. What would be the RMSEs if the time average is 30 minutes?

Page 19 Line 15, journal name should be added to the citation.

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