

Dear Editor and dear reviewer,

I apologize for the previous reaction to your comments. We hadn't completely understood your requests and this is the reason why our answer was so short and terse.

We took the time to study the problem more in depth and we have now a better understanding of the problem and, hopefully, also of your point of view.

The parts that we introduced/changed in the paper in order to address the issue of the sensor accuracy are reported in the following.

I send my best regards, also on behalf of my coauthors.

Silvia Bersan

Section 2.2 Piping test on a large-scale trial embankment

“According to the laboratory calibration the accuracy of the measurements was higher than 0.1°C up to a fibre length of 1 km. Please note that in the field, the accuracy may be affected by additional installation issues not considered in laboratory calibration, such as sharp bends in the deployed cable, connections and splices, which may induce step losses not addressed by laboratory calibration (Tyler et al., 2009). In the field test, significant effort has been paid to avoid sharp bending: the cable has been deployed with curvature radii larger than 20 cm. Moreover, neither splices nor connectors were present in the section of fibre under measurement. Nonetheless, splices and connectors were present elsewhere, and therefore a field calibration of the DTS system would have been advisable to compensate the corresponding step losses (Hausner et al., 2011; Hausner and Kobs, 2016). Unfortunately, field calibration was not carried out due to practical issues; for this reason some impairments on the overall accuracy of the system may be expected. Such impairments are expected to be of a rather small magnitude as the temperature variations expected over time are modest.”

Section 3.2 Temperature data

“The temperature anomalies detected were of very small extent, in the order of few tenths of a degree. [...] The small extent of the anomalies could also raise concern about the impact that the accuracy of the sensor has on the results. As previously stated, according to the laboratory calibration the accuracy of the measurements was higher than 0.1°C, but in the field the accuracy may be affected by step losses occurring at sharp bends, connections and splices along the cable. Since the main interest here is in relative measurements, i.e. temperature variations in space and in time, significant influence of step losses can be excluded because neither splicings nor connectors were present in the section of fibre installed under the dike. Moreover, if we consider the most informative part of the sensor, i.e. the most downstream line F1, also step losses induced by bends can be reasonably excluded. Of course all the step losses occurring between the reading unit and the line F1 could affect the accuracy of the measurements performed at the latter, but their effect on the relative measurements is expected to be negligible. It can be also excluded that the temperature measurements were influenced by excessive strain experienced by the fibre during the experiment. Indeed, the maximum strain measured by the single-mode fibre after four days of testing was around 400 µstrain. In addition, the strain experienced by the multimode fibres dedicated to temperature measurements was certainly much smaller since these fibres are placed into loose tubes to prevent excessive stresses.”