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Hydrology and Earth System Sciences Discussions

Interactive comment on "Assessment of a vertical high-resolution distributed-temperature-sensing system in a shallow thermohaline environment" *by* F. Suárez et al.

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We greatly appreciate the detailed, constructive, and thoughtful comments of Dr. Westhoff. These comments will be individually addressed after getting feedback from the other Referee. In the meantime, we want to clarify a few important points that are the main concerns of Dr. Westhoff:

1) The main objectives of this manuscript are to present a method for using DTS technology to obtain more reliable data from vertically wrapped fiber, and to assess the limitations of the technology (as described in the manuscript). The manuscript is not only limited to a manual calibration of the temperatures along the optical fiber. It also

includes insights in how to construct the vertical high-resolution DTS pole, how to estimate resolution and repeatability, and how to select the use of single- and double-ended measurements. A secondary objective is to compare the performance of the DTS system with more traditional sensors to show the advantages of the DTS technology when used in shallow thermohaline environments. In the final version of the manuscript we will ensure that our objectives are much more clearly articulated, and we appreciate the comment.

2) We cannot provide an exact explanation of the method that manufacturer's DTS software uses (i.e., native calibration) to calibrate the temperature along the fiber optic. These methods and algorithms are generally proprietary information that DTS manufacturers do not give to their users. That being said, we do provide details of calibrations based upon the theoretical and published response of the Raman responses.

3) We agree with Dr. Westhoff that a short sensitivity analysis should be performed for the calibration method and we will include it in the final version of the paper.

4) We agree with Dr. Westhoff that we were excessively detailed to describe the physics observed inside the solar pond. However, we want to point out that we have given a more detailed description of the solar pond and its configuration because we know that regular readers of HESS may not be aware of this rather unique shallow thermohaline environment. In addition, we wanted to show important features observed with the vertical high-resolution DTS system that are hard to observe using more traditional sensors or DTS systems with a linear arrangement of the fiber.

As explained before, the specific comments of Dr. Westhoff will be individually addressed after getting feedback from the other Referee and we do appreciate his thoughtful comments.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 8, 29, 2011.