

Interactive comment on “Heat transport of diurnal temperature oscillations upon river-water infiltration investigated by fiber-optic high-resolution temperature profiling” by T. Vogt et al.

T. Vogt et al.

tobias.vogt@eawag.ch

Received and published: 26 September 2011

Dear Editor,

hereby we submit additional short comments to clarify how we want to handle the main general comments of referee#1 and referee#2. We will assign a new title to clarify that we are studying lateral groundwater flow close to a losing stream.

Anonymous Referee #1 AC: We show the sensitivity of heat exchange on travel-time

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper



estimates qualitatively in Fig. 6D. Therefore, we will more clearly quantify the error of neglecting heat exchange with the unsaturated zone for typical 1-D interpretations where one temperature-sensor in the river and in a well is used.

Anonymous Referee #2 AC: The reason why we use diurnal temperature oscillations in this study is the short travel time of riparian groundwater close to rivers in pre-alpine gravel aquifers originating from river water infiltration. The seasonal signal is useful for longer travel times. In addition, we used the same 1-D approach that is used in “classical” applications with one temperature sensor in the river and one temperature sensor in an observation well to show the impact of heat exchange on such estimates. Therefore, we believe presenting 1-D time-shifts is reasonable. We interpret the 1-D expression not vertically, but lateral/horizontal. Therefore, we agree with referee#2 that the lateral heat transport is more important here and will arrange the paper in this direction. Moreover, we will reformulate the paper with regard to errors of lateral 1-D and 1 sensor solutions neglecting heat exchange.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 8, 6257, 2011.

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper