



Hydrogeophysical Site of La Soutte (Vosges, France): Temperature Measurement and Modelling for the Monitoring of the Subsurface Water content

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The experiment of La Soutte (Vosges, France) has started in 2004 to develop and test hydrogeophysical monitoring techniques, especially time-lapse techniques (like ERT, EM, MRS ..) and continuous-time electrical measurements of the Self Potential (e.g. see Session MPRG 14). Since November 2004, we also record temperature data in depth that illustrates the low-pass filtering effect of the soil on the temperature time-variations.

To interpret these data, we have solved the heat flow equation in 1D and inverted the observed data to obtain reliable estimates of the near-surface thermal properties (thermal conductivity, thermal diffusivity, and depth of interfaces in a multi-layer model). We will show results that are based on analytic solutions for a homogeneous half-space model, an analytic solutions in a two-layer model, and numerical solutions in a multilayer model.

Furthermore, since we have obtained thermal parameters within several time windows, we will discuss their variations in relation to the variation of the water content in the top soil.