



## **Simulation study of soil water and heat dynamics at two sites with significant preferential flow**

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Numerical models based on two hydraulically contrasting flow domains coupled through a simple transfer formula have become a useful tool for modeling both water flow and associated substance transport in structured soils. A comparative numerical study focused on the preferential flow effects on the soil heat transport is presented. Sites located in two different headwater catchments were included. Experimental catchment Liz is situated in a forested mountain area of Sumava Mts. in the southern part of the Czech Republic (altitude: 830 m, mean annual temperature: 6.3°C, mean annual precipitation: 861 mm). Uhlirska catchment is located in the north-west of the Czech Republic in Jizera Mts. and is currently undergoing reforestation (altitude: 820 m, mean annual temperature: 4.6°C, mean annual precipitation: 1400 mm). Both sites are instrumented for monitoring of the relevant meteorological and hydrological variables, as well as the soil moisture and temperature distribution. Changes of the soil water content and temperature during vegetation season were simulated. Model performance was qualitatively evaluated and shown to replicate the field measurements. The soils' heat budgets and the preferential flow effect thereon was compared and analyzed.