



## **Comparison diel signal of electrical potential differences in the trunk of trees with other eco-hydrological phenomena**

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Diel fluctuation of hydrological features in forested lands is not a highly researched area. Many of the details of geophysical effects on the eco-hydrological phenomena in forest covered areas are poorly understood, too.

In this paper some meteorological (net radiation, temperature, relative humidity data) and eco-hydrological (electrical potential differences data measured on the trunk of riparian trees, riparian groundwater level and stream base-flow data) parameters have been compared at a small time scale under forest covered environmental conditions. Analysed data set was measured at the outlet streamside point of the Hidegvíz Valley experimental catchment located at the eastern border of Alps.

Meteorological data have been recorded by a micrometeorological station in the neighbourhood of stream-flow, groundwater level reading and electrical potential differences measuring sensors.

Groundwater level and streamflow discharges were calculated from data of water pressure principle functioning sensor.

Electrical potential differences (EPD) have been recorded for several years between electrodes inserted in sixteen selected sites of trunks of two Alder trees (*Alnus Glutinosa* L.). The measured EPDs are related to the xylem-sapflow density.

All of the examined eco-hydrological phenomenon are induced by the evapotranspiration. Therefore Penman-Monteith evapotranspiration rate were calculated on the basis of meteorological data for comparison of EPD, groundwater and streamflow signal.

Detailed stochastic analysis (like dynamic spectrum, cross-correlation analysis etc.) was employed on the detrended eco-hydrological data series. These initial results help us better understanding of atmosphere, vegetation, water relationship in case of a streamside zone in hilly region.

**Keywords:** diel fluctuation, electrical potential differences, sap flow, evapotranspiration