Evapotranspiration impact on sapflow and other hydrological phenomena

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Forest covered catchments

During storms



$$Q = P - I - \frac{\mathrm{d}S}{\mathrm{d}t} - ET$$

Forest covered catchments





















• loss of water vapor through stomata





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- sap flows through the xylem





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- loss of water vapor through stomata
- sap flows through the xylem
- electrolyte is driven by a pressure gradient through a capillary tube (vessel elements)
- measurable streaming potential electric potential difference (EPD) to ground

V V

What can we measure?

- sapflow induced streaming potential depends on:
 - radiation
 - relative humidity
 - available water
 - temperature
 - wind etc.

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- sapflow induced streaming potential depends on:
 - radiation
 - relative humidity
 - available water
 - temperature
 - wind etc.
- stemflow caused shunt during precipitation (dew-fall)
- atmospheric electricity

What can we measure?



- sapflow induced streaming potential depends on:
 - radiation
 - relative humidity
 - available water
 - temperature
 - wind etc.
- stemflow caused shunt during precipitation (dew-fall)
- atmospheric electricity
- electrical activity of tree



Hidegvíz Valley



Micro-meteorological station, stream gages

















Aug. 2007 sapflow









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Dynamic spectra

Stream discharge



Baseflow and sapflow





- common time base (half hour),
- detrending of time series,
- standardizing,
- inverting to ET (only for visualization).

GW: groundwater, Q: baseflow

Analysis – cross-correlation

August



Analysis – cross-correlation



Analysis – cross-correlation



ET – EPD max. ccf: -0.72 at 3.5 hours