

Bachelor's Thesis

Modeling Infiltration with Java or JavaScript



Call

for a Web Application of infiltration modeling
as companion to the book

Preferential Flow - Stokes-Approach to Infiltration

by P. Germann, Prof. em. Soil Science (publication expected in 2012)

Infiltration is the transgression of liquid water from above into permeable ground, like soil, that comprises well connected pores. Gravity drives water along these pores while viscosity hampers flow. The picture shows the distribution of colored water in a clay soil some hours after the beginning of infiltration. The process is approached with laminar Stokes flow that yields the necessary set of analytical expressions.

Task

The software is to be developed as a web application which can run on any modern web browser. To achieve good performance and user interaction, the software should be developed as a client-side application i.e., using either Java or JavaScript. The software is expected to serve two purposes:

- (i) To model with set parameters any time series of input pulses according to the Stokes flow theory. The results are to be displayed as mobile water that varies with time and depth.
- (ii) As a tool to derive flow parameters from archived measurements.

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16.11.2011