



Automated minidisk infiltrometer module with an immovable float and a load cell water level logging

V. Klipa, D. Zumr, and M. Snehota

Czech Technical University in Prague, Civil Engineering, Czech Republic (vladimir.klipa@fsv.cvut.cz)

Hydraulic conductivity function $K(h)$ is a basic hydraulic property of soil. Laboratory measurements of $K(h)$ performed by steady-state standard technique on soil cores in the laboratory are tedious, time-consuming and therefore unsuitable for practical use. Tension disk infiltration method performed in the field is much more successful technique for practical use. With a basic design of tension infiltrometer the cumulative infiltration measurements are done manually by reading the level in the tensiometer reservoir.

This contribution presents a novel technique of the minidisk infiltrometer automation. The cumulative infiltration measurement is based on recording the change in buoyancy acting on an immovable float during water level fall in the reservoir of minidisk infiltrometer. It was shown by an independent experiment, that this method of water level logging is satisfactorily accurate and it is negligibly influenced by the bubbles emerging from the aeration tube. Therefore, this principle was involved in the design of compact minidisk infiltrometer with possibility of setting pressure head in the range from -0.5 to -5 cm. The prototype is currently being extensively tested on natural soils and quartz sand and test results will be presented at the poster.

Due to its automatic operation and relatively low cost the presented device is suitable for site surveys needed to solve practical environmental and management problems that require a characterization of unsaturated soil hydraulic behavior.

This work has been supported by TACR TA01021844.