



A new acquisition system for an intensive soil hydraulic characterization

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Recently, Di Prima et al. (2015; 2016) presented a new automated single ring infiltrometer. The device maintains a small quasi-constant head of water (i.e., 2–3 mm) on the infiltration surface. It is equipped with a differential pressure transducer to measure the stepwise drop of water level in the reservoir, and, in turn, to quantify cumulative infiltration into the soil. The data acquisition system consists of low-cost components and it is based on the open source microcontroller platform, Arduino. Recently, within the framework of the ANR INFILTRON project, we realized at the LEHNA laboratory a new acquisition system made of ten automatic infiltrometers and five data acquisition systems for automatic recording of ten simultaneous experiments. We also improved the design of the devices in terms of reservoir capacity and number of infiltrometers that can be simultaneously operated. This new acquisition system was tested on different soils with contrasting physical and hydraulic properties. The new configuration allowed to intensively sampling the soil, especially when many replications were necessary to overcome uncertainties in the hydraulic characterization due to highly heterogeneous soils. Field data along with statistical treatment clearly prove the advantage of the new acquisition system in comparison to single runs.

References

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