A Handheld Device for Intrusive and Non-Intrusive Field Measurements of Air Permeability. (S01-dane150912-Oral)

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Abstract:

Air permeability is an easy-to-measure soil parameter which is of direct importance in gas transport studies. Its values can also be used as indicators of soil hydraulic conductivity values. Both air and water permeability values are important for hydrological and agricultural studies involving, e.g., soil aeration and water run-off during rainfall events. We provide a design of a rugged, lightweight, handheld, single-reading device allowing for fast measurements of air permeability near the soil surface. The device makes use of two interchangeable air probes. The contact probe, well-documented in the petroleum engineering literature, is proposed as an alternative to the traditional insertion probe. Central to the in-situ measurement of air permeability is the concept of the probe geometric factor. Empirical relationships are proposed to make the application of this concept more amenable. Relative differences in air permeability values obtained with the two probes seem to be acceptable for permeability measurements.

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