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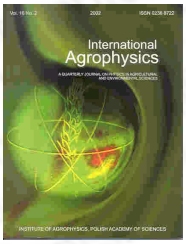

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Accuracy of soil moisture measurement by tdr technique

(get PDF)

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abstract The error in the measurement of volumetric water content by the TDR technique results from the correlation imperfections between the directly measured values of soil refractive index, n, and the real value of soil moisture as well as the hardware and software imper- fections of the TDR device and TDR probe installation. On the base of the laboratory measurements of the selected mineral, organic soils and their mixtures, it was confirmed that the soil solid phase significantly influences moisture values as determined by the TDR. Inclusion of the soil bulk density in the TDR calibration formula decreases the absolute error of the TDR determined soil moisture by the factor of two. The relative error of TDR moisture values increases in the lower range of water contents. This is due to a constant absolute error introduced by the measuring device and an increasing role of the soil solid phase in the soil refractive index.

keywords time domain reflectometry, soil moisture, measurement error