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Non-contact capacitive sensor for measurements of soil moisture profiles

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We present a home-built sensor for measuring the soil moisture along the depth. The sensor is constructed as a vertical stack of hollow cylindrical capacitive probes, each of them separated by very thin insulators. For long-term usage purposes, the probes are equipped in a plastic tube so that they are not contact to the soil samples. At each depth position, the soil moisture is measured by a couple of probes which act as a capacitor whose dielectric material is the soil. Each capacitor is a component of an electronic circuit oscillator whose oscillating frequency depends on the capacitance which in turn altered by the soil moisture.

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