

GC8-Hydro-99, updated on 25 Apr 2024

<https://doi.org/10.5194/egusphere-gc8-hydro-99>

A European vision for hydrological observations and experimentation

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Complex dielectric measurements permit accurate estimate of soil water content in saline environments.

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Dielectric sensors have been used for decades to monitor soil water content. While such measurements are straightforward for insulations, they may be challenging for electrically conductive materials. As a result, the performance of soil moisture sensors based on capacitance technology rapidly decreases with soil salinity. In alternative, dielectric permittivity and electrical conductivity may be estimated at once and very accurately by measuring the complex impedance of the sample. We present a new method for measuring the complex impedance, which can be implemented with very inexpensive circuitry. The resulting dielectric measurements are shown to be accurate for conductivity up to 20 dS/m. We will present preliminary results in soilless material and discuss the benefits of accurate dielectric measurements in greenhouse applications.