

Finapp: Measurement of soil moisture and snow water equivalent thanks to the cosmic rays

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1. Finapp S.p.A

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Date & Time: 26 MAY (TUE) 9:45-10:30 am

Venue: Exhibition Hall Stage Aarea

Language: Japanese and English

Contents:

A Finapp seminar presents how cosmic-ray technology can be used to measure water in a way that traditional sensors cannot.

At the core is the CRNS (Cosmic Ray Neutron Sensing) method. Naturally occurring cosmic rays constantly hit the Earth and generate neutrons near the ground. These neutrons interact with hydrogen atoms—mainly found in water. By detecting how many neutrons are reflected back, Finapp systems can estimate how much water is present.

The seminar typically explains two main applications:

- Soil moisture: Instead of point measurements, the technology provides area-wide data (up to several hectares), in real time and without direct contact with the soil. This is especially useful for agriculture, irrigation management, and drought monitoring.
- Snow water equivalent (SWE): It measures how much water is stored in snowpacks, which is critical for predicting water availability, flood risks, and managing hydropower resources.

It also highlights the advantages:

- non-invasive (no digging or installation in the soil)
- large-scale coverage
- continuous, real-time monitoring
- minimal maintenance due to self-calibratio