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The advanced qualtiy control techniques planned for the Internation Soil Moisture Network

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In situ soil moisture observations are essential to evaluate and calibrate modeled and remotely sensed soil moisture products. Although a number of meteorological networks and field campaigns measuring soil moisture exist on a global and long-term scale, their observations are not easily accessible and lack standardization of both technique and protocol. Thus, handling and especially comparing these datasets with satellite products or land surface models is a demanding issue. To overcome these limitations the International Soil Moisture Network (ISMN; http://www.ipf.tuwien.ac.at/insitu/) has been initiated to act as a centralized data hosting facility.
One advantage of the ISMN is that users are able to access the harmonized datasets easily through a web portal. Another advantage is the fully automated processing chain including the data harmonization in terms of units and sampling interval, but even more important is the advanced quality control system each measurement has to run through.
The quality of in situ soil moisture measurements is crucial for the validation of satellite- and model-based soil moisture retrievals; therefore a sophisticated quality control system was developed. After a check for plausibility and geophysical limits a quality flag is added to each measurement. An enhanced flagging mechanism was recently defined using a spectrum based approach to detect spurious spikes, jumps and plateaus.

The International Soil Moisture Network has already evolved to one of the most important distribution platforms for in situ soil moisture observations and is still growing. Currently, data from 27 networks in total covering more than 800 stations in Europe, North America, Australia, Asia and Africa is hosted by the ISMN. Available datasets also include historical datasets as well as near real-time measurements.
The improved quality control system will provide important information for satellite-based as well as land surface model-based validation studies.