



Is ground-based GPS able to monitor Soil Moisture?

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In various high precision applications GPS is used as a geodetic state-of-the-art tool to determine e.g. point positions. Within the functional model GPS-specific error sources have to be handled with care to guarantee correct, precise, and accurate results. These limiting errors are classified in satellite-specific errors, site-specific errors and errors due to the signal propagation through the earth's atmosphere. One important and hardly to model site-specific error source results from reflected GPS signals e.g. from the ground and is called multipath effect. In principle, these reflected GPS signals can be used to gather information about the state of the soil surface.

Within a project called MESMERISE (Meteorological Soil Moisture Experiment Series; http://www.imk.uni-karlsruhe.de/seite_1932.php) different sensors and techniques were operated simultaneously for one week with the aim to quantify the soil moisture of a small area (0.01 km²). In addition to standard sensors some experimental techniques (e.g. GPS) were tested.

The GPS experiment as well as the evaluation strategy will be presented and discussed in detail. Encouraging preliminary results and comparisons with standard sensors will be presented, too.