



L-band radiometer experiment in the SMOS test site Upper Danube

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In the frame of calibration and validation activities for ESA's soil moisture and ocean salinity mission, SMOS, the University of Munich operates a ground based L-band radiometer (ELBARA II) on an experimental farm in Southern Germany since September 2009. It is being used to validate the radiative transfer model, L-MEB, used in the SMOS Level 2 processor. The radiometer measures the natural emission of two fields in the microwave domain with a wavelength of 1.4 GHz. Its working principle is similar to that of SMOS, for which reason it can be used for validation of the radiative transfer model on the field scale. To support the validation, extensive environmental measurements are being made at the test site.

The radiometer is situated on an experimental farm near Puch, about 30 km west of Munich in the Upper Danube watershed in southern Germany in a temperate agricultural area. It is mounted on a 4 m high scaffolding that allows to turn the radiometer to look at 2 different fields with grass and winter rape as land use respectively.

In addition to the L-band measurements, thermal infrared (IR) measurements are performed. For this purpose, one thermal IR radiometer is attached to the ELBARA antenna to look into the same direction and two IR radiometers are constantly pointed at the two fields. Next to the radiometer is a meteorological station providing soil and air temperature profiles, precipitation, global radiation, wind speed and relative humidity measurements with an hourly resolution. In addition to that, soil moisture is measured with TDR probes in 2 profiles under each of the two fields with several probes installed at depths between 5 and 50cm. Vegetation and snow parameters are also recorded on a regularly basis. Soil roughness is measured with a photogrammetric approach.

An overview about the infrastructure and existing datasets is presented.