



Validation of SMAP soil moisture over a complex agricultural catchment in Austria

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NASA's Soil Moisture Active Passive (SMAP) mission was launched in January 2015. After an irrecoverable failure of the radar, the remaining passive L-band radiometer is now providing soil moisture in the upper layer of the soil as well as freeze-thaw state every 2-3 days on a 36 km Earth-fixed grid.

The first aim of this work is to validate SMAP soil moisture data against in situ ground measurements from the soil moisture network at the Hydrological Open Air Laboratory in Petzenkirchen (Lower Austria), which was installed in 2013. A heterogeneous agricultural catchment, the HOAL is characteristic for a range of catchments around the world. The network consists of 20 permanent and 11 temporary soil moisture stations distributed over an area of 66 ha. The challenge is to find a suitable combination of the in situ stations to represent the SMAP footprint. Therefore, additional sensors were installed outside of the catchment to facilitate upscaling of the in situ data to the scale of SMAP.

A validation at a similar spatial scale is performed using soil moisture data from the Advanced Scatterometer (ASCAT) on-board the Metop satellites and AMSR2 on-board GCOM-W1, respectively. Results show strong correspondence (Pearson $R > 0.5$) between SMAP and in situ and satellite soil moisture datasets. This investigation follows the work by Chan et al. (2016), using longer time series and validation data from a not yet investigated ground truthing site, and will help assess the performance of the SMAP mission.