



Three methodologies to retrieve root-zone soil moisture over a half degree pixel using microwave measurements

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A detailed land surface simulation has been performed at a 1 km² resolution over a 40x40 km² area in South-West of France (80 % of crops) from 1985 to 1995 and compared to local measurements obtained on different areas (during the HAPEX-MOBILHY experiment). Excellent fit is observed regarding both surface and root-zone soil moisture. Then, the averaged surface soil moisture has been compared to ERS Scatterometer surface soil moisture products and yields to an agreement of 0.06 m³.m⁻³ over the 1991-1995 period (SMOS accuracy is expected to be 0.04 m³.m⁻³). The aim of the study is then to evaluate the agreement of the root zone soil moisture obtained using three different methodologies. The first one is an empirical method based on time-series of surface soil moisture, the second is a simple variational assimilation scheme, and the last one is a sequential assimilation scheme (Ensemble Kalman Filter).