



Surface soil moisture retrieval based on brightness temperature from AMSR-E over a semi-arid region.

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Soil moisture products provided by remote sensing approaches at continental scale are of great importance for land surface modelling and numerical weather prediction. The Advanced Microwave Scanning Radiometer - Earth Observing System (AMSR-E) on-board Aqua is a multi-channel passive microwave instrument launched in 2002, which measures brightness temperatures at five frequencies in the range of 6.9 to 89 GHz. The brightness temperatures at low frequencies are the best approach to access to soil moisture. Thus, we propose a simple statistical regression of surface soil moisture based on AMSR-E brightness temperatures over Sahelian area, where soil moisture strongly influences and interacts with the land surface processes that control the land surface fluxes. The selected ground site, located in the Gourma region (Mali), is representative of environmental conditions of semi-arid area. This site was instrumented in the framework of the AMMA (African Monsoon Multidisciplinary Analysis) project, and specifically designed to address the validation of remotely sensed soil moisture in the context of the SMOS (Soil Moisture and Ocean Salinity) project. The simple statistical inversion, based on the 6.9 and 10.7 GHz at two polarizations channels, give an estimated surface soil moisture. A comparison between soil moisture retrieved with in situ soil moisture measurements show a good agreement relate to the temporal variability and volumetric values, which are better than AMSR-E soil moisture product level 3 over Sahelian areas.