



## **Soil moisture remote sensing over the Gourma mesoscale site**

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This paper investigates the potentialities of active and passive microwave remote sensing for soil moisture monitoring over the Gourma region of Sahel. First ground truth measurements of soil moisture are described. Eight local soil moisture stations have been installed, spanning 2 degrees in latitude between 15°N and 17°N. This soil moisture network was specifically designed for validation of remotely sensed soil moisture in the context of the preparation of the future SMOS satellite. Kilometric transect measurements of surface soil moisture have been also performed to address upscaling features of surface soil moisture. Second, AMSR C-band brightness temperatures (H and V polarization) are used to perform soil moisture inversion for 25km x 25km pixels over the region. Inversion is based on a statistical approach where external information on vegetation is obtained from MODIS reflectances. Retrieved surface soil moisture is evaluated against ground soil moisture measurement at different scales, showing improvement on retrieval accuracy compared to AMSR soil moisture products. Then, active microwave (ENVISAT/ASAR, WS mode) is used for soil moisture retrieval at 1km x 1km scale. This method, based on statistical inversion of backscattering coefficient has been validated against field measurements and extended to regional scale for soil mapping purpose. The synergy between active and passive microwave measurements is investigated through the comparison between ENVISAT/ASAR and AMSR surface soil moisture products. A comparison is performed to compare aggregated ENVISAT/ASAR soil moisture to AMSR retrieved soil moisture at 25km.