



## **Soil moisture mapping in Western Africa based on ERS Scatterometer**

M. Zribi, C. André, B. Decharme

CETP/CNRS, 10-12 av. de l'Europe, 78140 Vélizy, France (tel.: 33 1 39 25 49 34, fax: 33 1 39 25 49 22, email: zribi@cetp.ipsl.fr)

The analysis of feedbacks between continental surfaces and the atmosphere is one of the key factors to an understanding of African Monsoon dynamics. For this reason the monitoring of surface parameters, in particular soil moisture, is very important. Satellite remote sensing appears to be the most suitable means of obtaining data relevant to such parameters. This study presents a methodology applied to the mapping and monitoring of surface soil moisture over Western Africa, using data provided by the ERS Wind Scatterometer radar instrument. In this paper, an empirical model is proposed to estimate volumetric soil moisture using multi-incidence WSC radar data. A normalisation of radar data is made for all incidence angle data. An identification of roughness effect on radar signal is made for each radar cell. The radar signal sensitivity to soil moisture is linked to vegetation dynamic, using analysis with NDVI estimated from AVHRR data. After elimination of roughness and vegetation effects, radar processed signal is linked to surface soil moisture value. The proposed estimation is compared to ground truth measurements and different soil-vegetation-atmosphere models. A good coherence is observed between satellite estimations and model output with a high correlation with spatial and temporal rainfall variations. A daily mapping is proposed from 1991 to 2000.