



A developed methodology to map surface moisture over Kori Diantandou site (Niger) with Asar/Envisat radar data

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The analysing of feedback between continental surfaces and atmosphere is one of the key questions in AMMA project to understand Monsoon dynamics. For this reason, the monitoring of surface parameters, particularly vegetation characteristics and soil moisture are very important. Satellite remote sensing seems the more adapted to provide these parameters. This paper presents a methodology to map and monitor surface soil moisture over Kori Diantandou site in Niger with ASAR/ENVISAT radar satellite data.

This study is based on 8 ASAR/ENVISAT C band radar data acquired during 2004 rainy season. Radar data is sensitive to surface moisture, vegetation and soil roughness. Therefore, soil moisture inversion is made only over bare soils and low density vegetation. A mapping of vegetation density with SPOT/HRV optical image, a mapping of pools and a digital model are used to identify the regions of interest. A normalisation of multi-incidence radar data to one incidence angle is made in order to increase the number of data used to monitor surface parameters. Simultaneously to radar measurements, surface soil moisture measurements are made in different localisations of the studied site. A semi-empirical model was developed to estimate soil humidity from processed signals and ground truth data.

A mapping of surface moisture is proposed for all the Kori site. The results are in good agreement with ground truth data. This study shows the high potential of ASAR-ENVISAT for surface moisture monitoring with a high repetition frequency (about 5 days).