Geophysical Research Abstracts,
Vol. 11, EGU2009-12888, 2009
EGU General Assembly 2009


# On the potential of an RST-based analysis of C-band AMSRE data for soil moisture retrieval

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Among microwave radiometers which could be used for soil moisture retrieval, the Advanced Microwave Scanning Radiometer on Earth Observing System (AMSRE), is the one that, for its spectral characteristics (5 observational bands in the range 6.9 - 89 GHz), should have given more reliable results. Unfortunately, after its launch (AMSRE is flying aboard EOS-AQUA satellite since 2002) diffuse C-band Radio-Frequency Interferences (RFI) were discovered contaminating AMSRE radiances over many areas in the world. For this reason X-band (less RFI affected) based retrieval algorithms instead of the original based on C-band have been since then preferred.
In this work, the multi-temporal RST (Robust Satellite Techniques) approach has been applied in order to: i) automatically identify areas systematically affected by RFI contaminating C-band AMSRE radiances in order to build a suitable RFI Exclusion Map for AMSRE C-bands; ii) compute a suitable Polarization Ratio Variation Index (PRVI) investigating its expected relations with soil wetness by systematically using AMSRE C-bands, substituting it with AMSRE X-bands only in the previously identified as RFI contaminated; iii) propose a specific AMSRE data analysis strategy saving wherever possible the potential of C-band data for soil moisture retrieval.
The whole Africa has been used as test area, and long-term historical series of AMSRE C-band Polarization ratio have been analyzed in order to verify if a well-established change detection technique like RST may provide suitable RFI Exclusion Maps for AMSRE C-bands and significant improvement in quality and reliability of soil moisture variation retrievals based on the combined use of AMSRE C and X bands.
Preliminary results obtained by such an analysis will be shown in this work and discussed also by a comparison with the standard AMSRE soil moisture products, daily provided by NASA.