



Characterisation of Calibration-Related Errors of the Initial METOP ASCAT Soil Moisture Product

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Since 2008 EUMETSAT has been operationally distributing a global 25 km surface soil moisture product derived from METOP ASCAT measurements. Soil moisture is retrieved by using the change detection model originally developed for the Active Microwave Instrument (AMI) flown on the European satellites ERS-1 and ERS-2 by the Vienna University of Technology. With the launch of the first of three METeorological Operational Platforms (METOP-A) in October 2006, the Advanced Scatterometer (ASCAT) on board METOP-A takes over and enhances the role of its predecessor AMI. The original Soil Moisture Retrieval Algorithm was expected to be almost directly applicable for ASCAT with only minor changes, since the configuration and technical design is similar to the ERS Scatterometers. For the TU-Wien model an important aspect is to have a robust historic long-term reference data set of scattering parameters. In view of this fact, the initial ASCAT Soil Moisture Product had to rely on the Model Parameters derived from over 15 years of ERS-1/2 data sets. Because of differences in calibration and resolution, the combination of ASCAT backscatter measurements and ERS-1/2 historic long-term reference causes some problems in the initial Soil Moisture Product. The objective of the analyses was to investigate the initial ASCAT Soil Moisture Product with the main focus on quantification of the influence from the ERS-1/2 historic long-term reference data set on the initial Soil Moisture Product. Therefore, a model was developed to investigate the expected two main effects: spatial resolution and calibration difference. It turned out that a simple model is able to describe the remaining artifacts in the initial ASCAT Soil Moisture Product, which especially occur in areas characterized by sharp backscatter contrasts.