

SIMILARITIES OF ASAR GW AND PASSIVE AIRBORNE L-BAND OBSERVATIONS

ABSTRACT

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The medium resolution soil moisture dataset from the Advanced Synthetic Aperture Radar Global Mode (ASAR GM) onboard ENVISAT satellite has become available over the Southern African Development Community (SADC) and recently also over Australia. The validation activities of the dataset were limited due to the lack of in-situ and absence of other medium resolution soil moisture data over SADC. As part of the SMOS validation campaign, a passive microwave emission data at 1 km spatial resolution were collected using the Polarimetric L-band Multiband Radiometer (PLMR) over Central Australia (Lake Eyre, Simpson Desert). This allows for a first cross-comparison of two independent microwave datasets - C band radar and L band radiometer - at medium resolution. In the present study, the two recently acquired 1km resolution airborne passive microwave scenes are combined with the parameters derived from the ASAR GM data across three 50km x 50km domains of

Central Australia. In particular, the "sensitivity" and "correlation" parameters are derived from the long time-series (> 400 acquisitions on average) of the ASAR GM data that represent respectively the difference between minimum and maximum moisture conditions and the correlation between local (1 km) and regional (50 km) scale. It is found that the ASAR GM parameters reproduce similar spatial patterns as the data obtained from the PLMR. In particular the heterogeneous pattern of the salt lake Lake Eyre suggests that the long time series of the medium resolution active microwave data may be used to disaggregate low resolution passive data. These findings may have important relevance to ASCAT applications, as such active/passive ground validation techniques, if proven to be applicable everywhere else in the world, will allow to study and understand sub-pixel phenomena within coarse resolution data, as they are available from ASCAT.