



Snow cover regime in Livingston and Deception Islands (Maritime Antarctic) using multitemporal analysis of ASAR imagery from 2009.

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ASAR images from Envisat (WSW and IMM) are analyzed to study the snow cover regime of Deception and Livingston Islands (South Shetlands, Antarctic Peninsula) during 2009. The study is part of the project PERMAN-TAR focusing on monitoring and modeling the thermal regime of permafrost. For a GIS-based spatial modelling of snow cover distribution, spatially distributed data is required and the exploration of microwave remote sensing is the most suitable technique for mapping the snow cover characteristics and regime. This becomes especially true due to the long winter night and unstable weather conditions of the northern Antarctic Peninsula region. For this purpose a multitemporal ASAR imagery analysis was conducted in order to distinguish wet snow cover from snow free terrain using the absorption dependency of the radar signal on the liquid water content of the snow to set a threshold on the differential backscatter between scenes.

The imagery was analyzed using the processing chains from NEST (ESA SAR Toolbox). Preliminary results of the analysis of the time-series show strong seasonal changes in the backscattering due to the variations of liquid water content in snow. Validation of the results obtained from the microwave imagery is done using the ground truth data. In January and February 2009 we have installed in Livingston and Deception islands time-lapse camera in key-areas, ultra-sonic sensors of the snow thickness and probes with snow temperature mini-loggers. This data will be collected from field sites in January 2010 and used for the calibration of the results.

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