ASAR analysis of the snow cover in Livingston and Deception Islands.

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ASAR images from Envisat are analyzed to study the snow cover regime of Deception and Livingston Islands (South Sthetlands, Antarctic Peninsula). Data is provided by the European Space Agency in the framework of the Proposal Category-1: Snow cover characteristics and regime in the South Shetlands (Maritime Antarctic) - SnowAntar.

Medium resolution images (WSW, APM and IMM) are analyzed since December 2008, and are prepared using the processing chains from BEST (Basic Envisat SAR Toolbox). The process includes the transformation of DN into power values, geometric and radiometric correction, image filtering and computation of the backscattering coefficient for each pixel. Thereafter, the imagery is analyzed in image analysis software for the classification of backscattering. A multitemporal imagery analysis is conducted in order to set a threshold on the differential backscatter between scenes under wet snow and snow free-conditions. These algorithms allow for the study of snow surface wetness and snow water equivalent.

The study of snow cover regime is linked to the permafrost monitoring and modeling effort conducted in the region in the framework of the PERMANTAR-PERMAMODEL projects. The proprieties of snow are of major significance for the ground energy balance and therefore to the ground thermal regime, since thick snow provides excellent insulation. Permafrost is therefore influenced by snow cover properties, spatial distribution and regime. Snow cover maps will be produced for integration in permafrost modeling and also for comparison with re-analysis data from ERA-Interim.

The poster presents the first results of the imagery analysis of the snow cover regime since December 2008. The satellite data is validated in the field with several areas of interest (AOI) with snow thickness monitoring devices based on thermal regimes at different heights.