



Snowpack monitoring with a Ku-Band GB-SAR system: preliminary results of a field experiment in Val Grosina

Oriol Monserrat (1), Guido Luzi (1), Francesco Zucca (2), and Davide Notti (3)

(1) Centre Tecnologic de Com. de Cat. (CTTC), Remote Sensing, Castelldefels, Spain (oriol.monserrat@cttc.es), (2) Dipartimento di Scienze della Terra e dell' Ambiente - Università di Pavia via A.Ferrata, 1 I-27100 Pavia, (3) Department of Geodynamics of the University of Granada

In the last decade the role of the techniques of Microwave Remote Sensing, both active and passive, has gained relevance in the monitoring, parametrization and mapping of snow cover and its dynamics. Concretely, regarding to the use of the radar techniques, the X and Ku bands seem to offer many possibilities for research and application. In this work are shown the preliminary results of a monitoring campaign of an instrumented slope located in Malghera in Western Val Grosina (Sondrio). The measurement were based on the use of a terrestrial synthetic aperture radar (Ground Based Synthetic Aperture Radar - GBSAR) working in Ku-band. This type of systems, has been successfully used for monitoring of deformations and landslides of slopes subjected to instability. It allows to acquire maps of the interferometric phase and the radar reflectivity of the observed slope with a frequency of about 17 minutes. The monitoring period was of three days. Together with the GB-SAR measurements, were also carried some ground truth. Despite the short period of the campaign due to logistic problems and the fact that the snow melting of the monitored surface, the analysis of the acquired data showed an interesting unexpected behavior of the interferometric information. In fact, despite the critical state of the snow cover, the geometry of the observations and the used wavelength used, the phase signal seems to maintain an unexpected good degree of coherence, also indicating the presence of a good correlation with the height of the snow. The main goal of this work is to show experimental results and formulate some hypotheses of interpretation in order to understand the role of the geometric characteristics and dielectric properties of the medium investigated on the phase and amplitude of the radar signal in the Ku-band.