



Basic findings of the GALAHAD project

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The European Union funded GALAHAD Project (Advanced Remote Monitoring Techniques for Glaciers, Avalanches and Landslides Hazard Mitigation) addresses to landslides, avalanches and glacier related hazard mitigation through the development of advanced monitoring techniques and the improvement of forecasting methods and tools. Remote monitoring techniques are based on ground based and space borne SAR (synthetic aperture radar) technologies and terrestrial laser scanning (TLS). The project aims at developing new and fundamental functionalities of the above mentioned remote monitoring techniques. These technologies can play an important role of relevance in assessing and forecasting landslides, avalanches and glacier hazards through enabling the improvement of reliability, precision and operative usefulness of the measurements and the forecasting capabilities.

Snow water equivalent (SWE) or the snow mass on ground and snow depth as well as their spatial distribution are key parameters in the assessment of avalanche hazards, for snow, snow drift and avalanche modeling and model verification. While the TLS maps the spatial snow depth distribution the SAR instruments can in principle be used to retrieve both snow depth and SWE. A ground based SAR instrument and the TLS instrument were operated during three winters at a test site in the Wattener Lizum (Austria) especially equipped for the GALAHAD project, during special observation periods contemporaneously.

A resume of the basic findings of the project related to snow and snow avalanches is given. The potential of the remote monitoring technologies are summarized, the applicability of the remote monitoring observations for the above mentioned snow and snow avalanche applications and the forecasting capabilities are critically reviewed.