



Changes of snow depth measured with a terrestrial laser ranging system

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In high alpine terrain, where direct (in situ) measurements are chancy, remote monitoring techniques exhibit a useful alternative. Terrestrial laser scanning (TLS) on snow provides spatial information of snow depth in a high resolution, within a few hours. Frequent measurements give the opportunity to follow the snow depth changes during winter, caused by snowfall, snow drift, settlement and melting.

At Hafelekar (Innsbruck, Austria), on a south-faced slope beneath a ridge, different types of snownets were set up for experimental purpose by Austrian Federal Service for Avalanche and Torrent control (WLV). In March 2006 laser measurements started on this site, to document the temporal and spatial distribution of snowdepth between these defence structures. Two automatic weather stations (avalanche warning center Tirol) are providing continuous measurements of wind, snow depth and temperature. Furthermore traditional methods (snow pits, probes, etc.) are proceeded, to verify the TLS data and to estimate the mass of snow, loading the snownets. The emphasis of this work was the analysis of the laser dataset and the presentation of periods with significant snow redistribution.