



## **Variations of snow depth and snowpack stability at the basin scale**

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Avalanche warning services provide information about the avalanche danger on the regional scale – typically without providing the degree of variation that includes random as well as deterministic components. At this scale validation is only feasible with avalanche activity monitoring. At the basin scale, stability assessment seems possible with a combination of remote sensing and modeling approach – in particular if snow depth distribution can be related to snow stability variation. We used a stratified randomized sampling design in the Steintälli catchment above Davos, Switzerland to perform SMP measurements. In total 125 penetration resistance profiles were recorded in one day over an area of about 0.1 km<sup>2</sup>. Snow profiles including stability tests and manual measurements of snow depth for reference completed our data set. Simultaneously, the snow depth was determined with a terrestrial laser scanner (TLS). A preliminary analysis showed fair agreement of manual with TLS measurements of snow depth. Patterns of snow depth were related to patterns of penetration resistance and stability, on one hand and to the meteorological drivers on the other hand. If a reliable link between weather, snow depth and snow stability can be established, information on patterns of stability at the basin scale may substantially improve avalanche forecasting.