Combining Wind Field Modelling With Spatial Snow Depth Measurements for Avalanche Forecast Purpose

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The snow cover distribution in alpine terrain is known to be highly influenced by the local wind field. In this study the correlation between different wind conditions and patterns of snow deposition was analysed for a potential avalanche release zone. For the purpose of this study the spatial distribution of snow depth was measured using terrestrial laser scanning technology. Showing an accuracy of +/- 5 cm and a high resolution of 24 cm (at a distance of 800 m) this measuring system is able to capture the major snow drift zones. As the meteorological conditions were known for the different snow fall events very high resolution wind fields (5 m horizontal resolution) were simulated with an atmospheric model ARPS (Advanced Regional Prediction System). The modelled wind fields combined with a very simple classification of snow conditions were correlated against the spatial snow depth data measured by terrestrial laser scanner before and after respective events.

The authors suggest the combination of both methods as valuable tool in terms of avalanche forecast and protection.