



## **SPATIAL VARIABILITY OF SURFACE HOAR LAYERS AT THE BASIN SCALE**

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Surface hoar deposited on the snow surface represents - once buried by subsequent snowfall - one of the principal weak layers on which dry snow slab avalanches fail. To act as weak layer a buried surface hoar layer needs to be present over a certain area of the order of 10 m. Avalanche forecasting relies - among other things - on meteorological data from automatic station. Surface hoar formation can be predicted from these data. However, its spatial extent in the surrounding terrain is unknown. It has been suggested that the spatial variability of formation conditions mainly depend on topographical parameters. In order to study the variation in surface hoar formation and destruction daily measurements were made during one winter period at 20 locations of different aspect and wind exposure within the same basin (about 1 km<sup>2</sup>). Two automatic meteorological stations were located within the study area, one on level terrain, one on a ridge top. The variation in surface hoar formation could mainly be explained by different prevailing wind regimes during the formation periods. Part of the study area was under the influence of local katabatic winds that affected humidity. There, the surface hoar growth conditions were usually less favourable than in the adjacent terrain, a freestanding ridge. The different wind regime in the sub-areas had a stronger influence on growth conditions than any other meteorological or topographic parameter. Predicting local variations in surface hoar formation for the terrain surrounding an automatic weather station is therefore hardly possible except the local wind regime would be known for any particular meteorological situation. For both, surface hoar formation and surface hoar destruction, wind conditions proved to be most decisive to explain spatial variation.