Permafrost Research in the Schrankar, Stubaier Alps

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Due to the large number of active and inactive/fossil rock glaciers in a number of expositions and altitudes, the Schrankar (Schran-Cirque) is ideally suited for permafrost investigations. Grain size of block fields and rock glaciers will be investigated with respect to their effect on direct, indirect and reflected solar radiation.

The analysis will be performed on the basis of laserscanning data, orthophotos and virtual models of block surfaces. A weather station and temperature logger have been installed for field data collection. The Bottom Temperature of Snowpack (BTS) will be surveyed on selected sites throughout the cirque in late winter.

Should grain size emerge as decisive factor for permafrost distribution, it will be derived by automated orthophoto analysis in order to be included as further parameter in semi-empirical statistical permafrost distribution models.

A first permafrost distribution model (fig. 2) based on proxy-variables assists the design of a BTS sampling strategy (fig. 3). The aim is to proportionally represent various expositions and altitudes as well as the assumed permafrost distribution in the cirque based on the classic 'rules of thumb'.

Fig. 1: The Schrankar

Fig. 2 Permafrost distribution following a PERMAKART based model. The lower limit of non-continuous permafrost varies with expositions and altitude. Such semi-empirical modelling approaches could be improved by including a description of the surface roughness, i.e. block grain size.

Fig. 3 Selected BTS sampling sites stratified by expositions, altitude, slope angle as well as existence of rock glaciers and expected permafrost distribution.