



Geophysical monitoring of permafrost occurrence in solid rock faces: Problems and perspectives

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The distribution of permafrost in rock faces and its temporal and spatial change has a significant influence on the stability of rock faces and thus the development of potentially hazardous mass movements. Therefore, the establishment of methods that contribute to an enhanced spatial and temporal understanding of permafrost occurrence and its variability through time is a necessity for detecting potential instabilities. In 2005 we tested the potential of DC resistivity tomography and refraction seismics for the spatial analysis of permafrost occurrence in solid rock walls. In the Turtmann Valley/Matter Valley, CH we established four DC resistivity monitoring transects that were observed in the transition between summer and autumn on a monthly basis in order to assess changes in the spatial arrangement of water and ice inside the rock walls. The results confirm the impact of previously reported factors such as aspect and topography on permafrost distribution. However, they also bring the importance of rock wall hydrology into focus - a factor that has not yet received much attention. This presentation will also pay attention to specific problems that arise when applying geophysical methods on solid rock walls such as distortions caused by rock face topography, contact problems that result from high internal resistivities and the bias induced by percolating water.