

Multidisciplinary analyses of detachment zones of periglacial rock fall events in the European Alps

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Numerous rock fall events have taken place in periglacial areas of the European Alps throughout history. This is mainly as a consequence of the steep topography in these areas, geological and geomechanical characteristics, erosion and climatic factors such as intense freeze-thaw activity.

High-mountain rock walls are often characterized by the occurrence of glaciers as well as large-area permafrost. Changes in surface and sub-surface ice, caused by the present and ongoing atmospheric warming, may have a strong influence on the stability of such steep perennially-frozen and glacierised rock walls, especially in combination with unfavourable geological and geomechanical conditions (Ballantyne, 2002; Fischer et al., 2006). Slope stability results from the interplay between driving and resisting forces. Many different disposition factors may influence these forces. Therefore, the identification and a better understanding of factors and mechanisms determining slope stability in steep high-mountain rock walls is a key factor for hazard assessment and needs basic research.

The primary objective of presented study is the investigation of possible geological, geomechanical and climate-related glaciological disposition factors. To this aim, data on past periglacial rock falls in the European Alps is collected and analysed in order to assess the main controlling and triggering factors of such slope instabilities. Thereby the conditions at the detachment zones of these rock fall events are investigated in a multidisciplinary approach by analysing different factors such as the topography, geology, geomechanics, permafrost distribution and glaciation (-history) with different methods. Based on these analyses, the influence of the different factors and processes on slope failures will be assessed.

REFERENCES

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