



Thermal regime and permafrost conditions within bedrock slopes

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Mountain slope dynamics are partly controlled by rock temperature because it affects weathering and release of material from bedrock slopes. This is especially true in cold environments, where ground freezing and permafrost influence rock damage and stability. Climate change can thus alter the spatial distribution of zones of increased rock damage and, likely effective on shorter timescales, can increase the frequency of rock fall by permafrost degradation. This contribution provides a synopsis of ten years of measurements between 2000 and 4500m a.s.l. in the Alps and uses detailed numerical modeling to highlight the temporal patterns and the spatial distribution of rock temperatures that are indeed very much different than air temperatures. The roles of topography, climate, material properties and snow are explored in their influence on rock temperature, its fluctuations and permafrost characteristics.