

Abstract Dissertation

Erik Kuschel

Application of multi-temporal remote sensing techniques for the monitoring and process analysis of landslides

The aim of the dissertation project is to characterise, monitor and analyse landslide processes in arctic and alpine regions based on multi-temporal remote sensing techniques via a multi-methodical approach based on terrestrial laser scanning (TLS), ground-based radar interferometry (GB-InSAR) and UAV-photogrammetry (UAV-P). The combination of LiDAR and Radar techniques allows the characterization of complex geological and geomorphological processes, such as landslides and rock glaciers in a spatiotemporal context in both quantitative and qualitative terms over a wide range of temporal and spatial scales.

Building upon the current state of research, this dissertation attempts to investigate deformation and/or failure processes of landslide (e.g. rock slides, debris flows and debris slides) and landslide-like phenomena in high alpine and arctic environments (e.g. cold regions). Particular focus is given to the impact of changing climatic and meteorological factors on the recent deformation dynamics of permafrost related processes (e.g. rock glaciers, active layer detachments) under changing meteorological conditions. Thus, enabling comprehensive kinematical analysis and modelling of present and future deformation and potential failure of complex landslide processes threatening lives and livelihoods of communities in cold regions.