

Constraining paleo-ice extents of the Gornergletscher, Western Alps, since the Last Glacial Maximum.

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With the current climate regime, our ability to quantify past conditions is crucial for predictions of climate scenarios and landscape evolution. This study investigates the paleo-ice extent of the Gornergletscher in Zermatt, Switzerland since the Last Glacial Maximum (LGM). Glacial reconstructions of Switzerland during the LGM (Bini et al., 2009) reveal that the majority of the area was covered with ice, with significant ice retreat since then.

The aim of this project is to gain a more detailed understanding of glacial fluctuations across the Western Alps, which encompasses some of the highest topography in Europe. Precisely constraining the glacial history of this region would provide valuable information on the local, and potentially global, climate at the time. Previous ¹⁰Be cosmogenic nuclide work has mainly focussed on ice surface lowering in other areas within the Western Alps (Wirsig et al., 2016), however an in-depth analysis of glacier retreat for the Gornergletscher has yet to be undertaken.

The method used here mainly relies on the use of Optically Stimulated Luminescence surface bedrock exposure dating (Sohbati et al., 2011), which was recently developed, where the basic principle relies on the formation of a bleaching front at the surface of rocks. Early investigations suggest a correlation between the depth of this bleaching front, elevation and exposure time to sunlight (Sohbati et al., 2011; Lehmann et al., 2018). Results from the analysis of samples collected down a vertical transect from the area in Fall 2017 will be presented and used to quantify glacier thinning rates during the Holocene. Details will be provided on the method accuracy, limitations and potential.

References:

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