EGU2020-8432
https://doi.org/10.5194/egusphere-egu2020-8432
EGU General Assembly 2020

Quantifying post-glacial erosion at the Gorner glacier, Switzerland, using OSL and 10Be surface exposure dating.

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Quaternary erosion through glacial and post-glacial processes has left an imprint on Alpine topography. There are few methods capable of resolving these processes on Late glacial to Holocene timescales. The aim of this study is to contribute towards a more detailed understanding of post-glacial erosion across the Central and Western Alps by better constraining the post-glacial erosion history of the Gorner glacier in Zermatt, Switzerland. This is done using a new approach that combines Optically Stimulated Luminescence (OSL) and ^{10}Be cosmogenic nuclide surface exposure dating to invert for post-glacial erosion rates (Lehmann et al., 2019). Both dating methods are influenced by surface erosion but operate on different spatial scales- OSL signals form within the first 1-5 mm of a rock surface (Sohbati et al., 2011) whereas the ^{10}Be signal accumulates within approximately the first 3 m (Lal, 1991). Six bedrock samples, exposed progressively since the Last Glacial Maximum, were collected along a vertical transect spanning an elevation of 641 m. Preliminary results show inheritance in the bottom three samples suggesting multiple advances and retreat. Further results for the post-glacial erosion rates down the transect, and comparison to other glaciers in the Western Alps, will be presented.

References:

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