

# Cosmogenic nuclide dating of glacially driven sediments: insights from the Alps

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Cosmogenic  $^{10}\text{Be}$  and  $^{26}\text{Al}$  can be employed to reconstruct the chronology of sediment layers. Accumulation of these can be used to exposure date the sediment layer as the variation of cosmogenic nuclide concentration with depth can be modeled. Decay of  $^{10}\text{Be}$  and  $^{26}\text{Al}$  in the samples from a well-defined single bed in a deposit enables the modeling of the post-burial component and the determination of the  $^{26}\text{Al}/^{10}\text{Be}$  at the time of burial. The isochron-burial age can then be calculated from the initial and the measured ratios.

In this study, we focus on the oldest Quaternary deposits of the Alpine Foreland. These are called Swiss Deckenschotter (cover gravels) as they build mesa-type hill tops on the Mesozoic or Cenozoic bedrock of the Swiss Alpine forelands. Deckenschotter consists of glaciofluvial gravel layers intercalated with glacial and/or overbank deposits. Although previously morphostratigraphically correlated with Günz and Mindel glaciations of Penck and Brückner, the Swiss Deckenschotter is likely much older, and their chronostratigraphy is not well constrained. In order to reconstruct the chronology of these deposits, we applied cosmogenic depth-profile and isochron-burial dating techniques at six key locations at different altitudes ranging from 433 m a.s.l. to 675 m a.s.l. Our results indicate that the gravels at studied sites were accumulated in the foreland between 1 and 2 Ma.