



## Overdeeping and stratigraphy of a typical Alpine foreland glacier

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The Northern Alpine Foreland was repeatedly covered by massive piedmont glaciers during Quaternary peak glacial periods. Remnants of the Salzach foreland glacier (Austria/Germany) represent the easternmost of a series of piedmont glaciers entering the Foreland by major Alpine valleys reaching far into the Alpine Molasse. The area of the former Salzach foreland glacier (SFG) marks a unique place as remnants of at least 4 glacial maxima meet an abundant geodatabase including information on the digital topography and the internal built up of glacial deposits derived from outcrops and several hundreds of drillings. During the LGM, it covered an area of more than 1000 km<sup>2</sup> and was even more extensive during older peak glacial periods. The lack of absolute ages as well as systemic investigation of the internal built up did so far impede the reconstruction on its dynamics. Here we aim to bring more light into the erosional and depositional history of a typical north Alpine piedmont glacier, the SFG, by analyzing drill log data, field outcrops, topography and the depositional ages of sediments. We focus on the proximal (axial) and distal parts of the SFG lobe. Some of the major unresolved questions regarding the Quaternary evolution of the major Alpine foreland glaciers are: Is the glacial erosion of Miocene bedrock the consequence of one glacial cycle or does it rather reflect successive erosional events during each glacial period? What is the spatial variability and potential depth of erosion? What is the structure and internal built up these deposits?

The intent of this study is not to answer these questions in detail but to deliver important constraints: Our results indicate that more than 300- 400 m of bedrock were eroded during an early peak glacial period (such as antepenultimate glacial period or even earlier). Erosion was rather uniform across the lobe with larger values only occurring in the center (axis) of the glacier. Accumulation of more than 100 m of deposits occurred later, potentially during the antepenultimate and penultimate glacial maximum (MIS 6). Deposits suggest a characteristic stratigraphy of glaciofluvial sediments and basal tills, with the lithofacies of fluvial sediments varying from the proximal to distal lobe parts. The general impact of the LGM (MIS2) seems to be minor.