THE GLACIALLY OVERDEEPENED SALZACH VALLEY: CONSTRAINTS ON ITS GEOMETRY AND FILLING.

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Overdeepenings are common features in glaciated and deglaciated regions worldwide and their sedimentary fillings may act as important archives for regional environmental change and glacial history. Sedimentary fillings are also important targets of geotechnical exploration and construction including groundwater resource management, shallow geothermal exploitation, tunneling and the foundation of buildings. This is especially true in densely populated areas such as the European Alps and their foreland areas, regions which have been multiply glaciated during the last million years. However, due depths often exceeding some hundreds of meters, the overall knowledge on their geometry, formation and sedimentary content is still poor and commonly tied to some local spots.

Here we present a bedrock model of the overall Lower Salzach Valley, a major overdeeping in the European Alps. We utilized seismic sections from hydrocarbon exploration surveys and deep drillings together with topographic and modelling data to construct a 3D bedrock model. Through the existence of seismic inline and crossline valley sections, multiple drillings reaching the bedrock surface, log and abundant outcrop data we were able to create a very accurate digital bedrock topography. We furthermore analyzed the sedimentary content of the valley as recorded by driller's lithologic logs. Our results suggest that the valley highlights highs and lows of different magnitude and underground valley widths of variable extent. Data also indicates that the deepest part, reaching around 450 m below the alluvial fill, is not situated at a prominent glacial confluence but is probably related to high erodible rock. The sedimentary succession, representing massive gravels and lacustrine fines, indicate that the valley was not fully excavated during the last glacial coverage at the LGM.

Through its high model accuracy, the Salzach Valley overdeepening might be a highly suitable testing site for future numerical simulations.