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## Seismic response of three glacially overdeepened valleys – a comparison

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Seismic imaging is a spiffing tool to explore the shape and stratigraphy of Quaternary structures such as glacially overdeepened valleys. Recent seismic investigations have unlocked some of the secrets of three of such valleys in the European Alps. Their locations range from distal Quaternary overdeepened basins in the Alpine foreland, i.e. Tannwald Basin (TB) in Germany and the Basadingen Valley (BV) in Switzerland, to the proximal, intra-mountainous Lienz Basin (LB) in Austria. All of them are also primary investigation sites of the project Drilling Overdeepened Valleys (DOVE), funded by the International Continental Scientific Drilling Program (ICDP).

Seismic reflections map the shape and the internal structure of the infill of these basins in detail. The LB shows a classical sedimentary succession of only one glacial cycle, i.e. (from bottom to top) tills, lacustrine sediments, and fluvial deposits. Reflections in the bedrock are not visible. This is in contrast to the distal foreland basins that incise Tertiary sediments and possess sediments of more than one glacial cycle. The reflection patterns of the substrata of the TB and BV basins consist of deeper, continuous horizons and a thick sedimentary package that was incised by glacial erosion. However, the internal reflections differ significantly. In the TB, we discriminate (from bottom to top) plucked molasses units, till of an older glacial cycle, lacustrine sediments, younger till and till sequences, as well as fluvial deposits on top. The preliminary result of the BV illustrates several unconformities and a spatial highly variable setting. The latter is supported by trackable horizons that show several laterally-shifted troughs within the basin fill.

The comparison of the seismic results thus reveals the difference of the sedimentary infill of all three glacially overdeepened valleys. Especially, the internal structure of both basins in the foreland shows unexpected variability.