Improving identification of regional depth phases in sparse networks

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Due to Vienna's location in a seismogenic region, it is important to characterize seismicity in the vicinity well. Instrumental seismicity in the area is moderate, with a maximum recorded magnitude considerably stronger than 5. There are historical records of earthquakes with intensities equivalent to magnitudes around 6, and even larger events have been suggested based on paleoseismicity.

The Austrian seismological network is built of very-high quality stations, but their stations are spread too widely to determine earthquake depths accurately for small earthquakes. Therefore we attempt to optimize use of the network for locating earthquakes, and especially the hypocentral depths. Regional depth phases such as sPg, sPmP, and sPn are particularly promising for that purpose, since they require only few observations. In principle, a single station may be sufficient for accurately determining earthquake depth. The challenge lies in robustly detecting and identifying the phases, which are usually superimposed by the coda of the P-phase.

To make regional depth phases in our investigation area usable for depth estimation, several techniques were applied to three-component seismic data from the Vienna region. The first technique was stacking traces along predicted travel times for different earthquake depths. Another technique tested is a polarization filter presented by Schimmel & Gallart (2004), which is used in reflection seismology.

Assembling geophysical datasets from Austria

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Geophysics is becoming more and more important in Austria due to needs associated with natural resources (oil/gas, mineral resources, water and geothermal energy) as well as natural hazards (seismic, landslides). Over the last decades a larger number of geophysical measurement campaigns has been performed, and multiple datasets are available from a number of sources, including public institutions (e.g. GBA, ZAMG), and companies (e.g., OMV, RAG, and others). For the interpretation of results information from other branches is often important.

For all these reasons, we gather available results of geophysical surveys in Austria. A presentation of gravimetric and magnetic fields, together with tomographic models, seismic hazard data and other datasets allows comparisons, here on a qualitative basis. This can serve as a basis for judging needs for further campaigns and comparison with geological data.

Trans-boundary Assessment, dissemination and management of Hydrogeothermal Energy Resources of Slovenia, Austria, Hungary and Slovakia in the frame of the CENTRAL EUROPE project TRANSNERGY

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In the Pannonian basin and its surrounding good conditions for the production of geothermal energy are met due to the occurrence of deep aquifers and the elevated heat flow rate (Lenkey et al., 2002). But these natural resources are limited and a sophisticated water management is necessary to avoid overexploitation and conflicts among users. This is especially valid for near-border regions, because the hydrothermal systems are strongly linked with favourable geological settings which don't end at the state boundaries. In this region a multilaterally harmonized management of subsurface thermal-waters offers challenges.