Improving identification of regional depth phases in sparse networks

APOLONER, M.-T. & BOKELMANN, G.
Universität Wien, Institut für Meteorologie und Geophysik

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

ARNEITZ, P., GERNER, A., MEURERS, B. & BOKELMANN, G.
University Vienna

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

ATZENHOFER, B.,[1] SCHUBERT, G.,[1] LAPANJE A.,[2] CERNAK R.,[3] & NADOR A.[4]
[1] Geological Survey of Austria
[2] Geological Survey of Slovenia
[3] State Geological Institute of Dionyz Stur
[4] Geological Institute of Hungary

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.

The project TRANSENERGY – Transboundary Geothermal Energy Resources of Slovenia, Austria, Hungary and Slovakia (it is implemented through the CENTRAL EUROPE programme and co-financed by the ERDF) deals with trans-boundary thermal water management from a geoscientific point of few. Four national geological surveys are partners in TRANSENERGY project: MÁFI (Geological Institute of Hungary), GeoZS (Geological Survey of Slovenia), GBA (Geological Survey of Austria) and ŠGÚDŠ (State Geological Institute of Dionyz Stur, Slovakia). The project started in April 2010 and it will deliver its services in September 2013.

The project TRANSENERGY will deliver multilingual tools supporting a sustainable trans-boundary thermal water management. These tools comprise a profound geoscientific evaluation of the thermal water resources of the project area in which particular attention is paid to the pilot areas (see also fig. 1). These tools are based on geological, hydrogeological and geothermal models. Moreover, the project will deliver an overview on the actual legal framework on the use of thermal waters in the participating countries and the EU level and it will deliver a strategy paper with recommendations for an improved sustainable thermal water management in the project area. After the end of TRANSENERGY in September 2013 all achieved results (multilingual maps, databases, reports etc.) will be provided to the public by the project website (http://transenergy-eu.geologie.ac.at) in terms of online services.

10 years of Terrestrial Laserscanning (TLS) at the very active rock glacier Hinteres Langtalkar, Schober Mountains, Austria

AVIAN, M.,[1] KELLERER-PIRKLBAUER, A.,[1,2] & BAUER, A.[3]
[1] Institute of Remote Sensing and Photogrammetry, Graz University of Technology, Austria
[2] Department of Earth Sciences, University of Graz, Austria
[3] JOANNEUM RESEARCH - Institute for Information and Communication Technologies

Rock glaciers are the most prominent landforms in mountain permafrost environments. Active rock glaciers consist of perennially frozen debris supersaturated with ice and gravitationally creep downslope with rates ranging from a few centimetres to a few metres per year. Ongoing global warming affects rock glaciers behaviour as for instance warming of the permafrost body leading to thawing processes. Rock glaciers respond synchronously in velocity changes even at regional scale to changes in climate thereby mainly related to air and consequently ground temperature. The frontal part of this rock glacier Hinteres Langtalkar (N46°59´, E12°47´) is heavily influenced by disintegration through active sliding processes since about 1994. This process is even unusual for rock glaciers. Due to these specific geomorphic processes at the rock glacier front, it was decided in 2000 to initiate a terrestrial laserscanning (TLS) monitoring program. These measurements were carried out once or even twice per year since then (except 2002 and 2003) using the sensors RIEGL LPM-2k and RIEGL LMS-Z620. Therefore, this TLS data series is some of the longest for rock glaciers globally. Results show that the high movement especially in the lowest part stresses the internal structure of the rock glacier causing deformations on several shear horizons in the active layer or even in shallow depths of the permafrost body. The research activities at the rock glacier Hinteres Langtalkar are currently part of a monitoring network within the project “permAfrost – the Austrian permafrost research initiative”.

Mineralogy and microstructure of “glaze residues” and/or “glaze raw materials” from Anabaptist pottery production centres in Moravia

BAJNÓCZI, B.[1], NAGY, G.[1], TÓTH, M.[1], MAY, Z.[2], PAJER, J.[3], RIDOVICS, A.[4]
[1] Institute for Geological and Geochemical Research, Research Centre for Astronomy and Earth Sciences, Hungarian Academy of Sciences, Budapest, Hungary
[2] Institute of Materials and Environmental Chemistry, Research Centre for Natural Sciences, Hungarian Academy of Sciences, Budapest, Hungary
[3] Strášnice, Czech Republic
[4] Hungarian National Museum, Budapest, Hungary

Production of tin-glazed earthenware in East-Central Europe was disseminated by Anabaptists (Hutterites). They started faience production in the late 16th century. The main production centres of Anabaptist faience existed in Moravia at that time; nowadays twelve centres are documented thanks to the archaeological research. Among