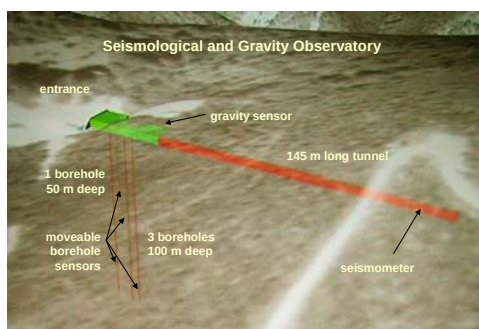


The Conrad Observatory

The Conrad Observatory is named after the famous seismologist and climatologist Victor Conrad (1876 - 1962), who worked at the Central Institute for Meteorology and Geodynamics in Vienna for many years. The observatory is situated about 50 km SW of Vienna, within a nature reserve at the outskirts of the Eastern Alps, at the so-called "Trafelberg" in Lower Austria at 1000 m above sea level. The remoteness of the location and the undisturbed surrounding of the underground-observatory allows special investigations and long term research projects to be conducted. These tasks will gain importance in the near future.

It is the only observatory of this type being situated in the Alpine region. The site is characterized by extreme low background noise - natural as well as technological ones. In addition, the design as underground observatory reduces surface vibrations once more. An almost constant temperature in the tunnel and in the adjacent boreholes contribute to the high quality of measurements. No ventilation system is required, which would result in unwanted vibrations.

The underground building-compound of the Observatory has its own power-supply and is connected via data-transmission lines with the Department of Geophysics at the Central Institute for Meteorology and Geodynamics in Vienna. Via a remote control system, the operations of all instruments, power-supply, temperature, access to the facilities, etc. can be checked and regulated if necessary.



The observatory serves different geophysical disciplines. One of them is seismology. Understandably, research results in seismology are very strongly influenced by the quality of the seismic system, which is employed to monitor extreme small movements of the ground. A variety of such instruments is available today on the market. Currently, the observatory can be used to

1. monitor the world-wide seismicity with its seismic stations
2. monitor underground nuclear tests
3. calibrate seismometers
4. develop and test new systems
5. compare the performance of different instruments

under controlled conditions. These comparisons are necessary to ensure correct long-term observations of changes in the Earth crust, which can only be accomplished with monitoring systems, which perform extremely reliable during the total period of observation.



Q330 and Baler for digitizing ground motions and interim data storage.



The 145 m long seismic tunnel hosting several piers



Superconducting GWR C025 gravimeter



The following institutions visited the Conrad Observatory during the EU project NERIES (2007-2010):

Alfred Wegener Institute (AWI) – Bremerhaven:
Testing Ocean Bottom Seismometers, Digitizers and Array Networking

Environmental Agency of the Republic of Slovenia (ARSO):
Quality test of Guralp CMG-40T and digitizers

Royal Netherlands Meteorological Institute (KNMI):
Self-noise of the STS-2

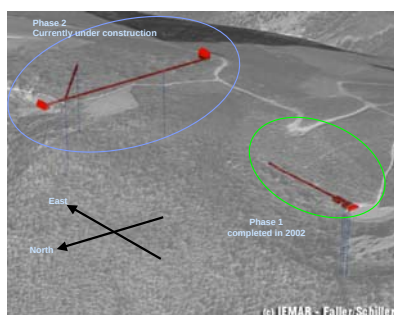
Geophysical Institute of Israel (GII):
Testing of ground motion sensor for microzonation studies

University of Trieste (DST):
Testing strong-motion sensors



Epiensor and STS-2 broadband sensor

The 3-component calibration table determines the seismometer constant. Developed by Edi Mayer & Partners/Switzerland and Föhrenbach/Germany in collaboration with Prof. Erhard Wielandt and DI Gunnar Streckelsen.



The third part of the Conrad Observatory is a Geomagnetic Observatory for research and development, currently in the final planning stage. Within the scope of geomagnetism, the development of new observation methods and systems for the 4D - (X, Y, Z and time) determination of the geomagnetic field originating from natural and industrial sources can be studied. In addition, smallest changes of the earth-magnetic field prior and after earthquakes can be verified. Since the biosphere gained increasing importance during the past decades, the research of the static and alternating magnetic field can be investigated, as well as the physics of the high atmosphere. In the latter case, disturbances of the Earth's magnetic field due to effects from sun-storms on telecommunications, navigation systems, power supplies and security-systems have attracted increased attention recently.

Due to the combination of seismological, gravity and geomagnetic research, the Conrad Observatory near Vienna constitutes a unique laboratory for national and international research and development tasks within Austria.

Author:
Doz. Dr. Roman Leonhardt
Conrad Observatory
Zentralanstalt für Meteorologie
und Geodynamik
Hohe Warte 38
1190 Vienna
Austria

roman.leonhardt@zamg.ac.at

www.zamg.ac.at/conrad_observatory

