

Magnetic repeat station surveys in Austria

The Earth's Magnetic Field is changing continuously, in the wide range from milliseconds to hours, years and decades. For many practical purposes, it is a necessity to know the current field values for a certain location or even for the whole of a state territory. An example for the latter is a country's geomagnetic map, which presents the annual mean values for a certain year, and which serves for navigation applications, for instance. For scientific purposes, the changes of the geomagnetic field reveal details of the generating mechanism of the magnetic field, i.e. of the magnetic dynamo, which is situated in the deep earth interior, at the core-mantle boundary. In order to provide present magnetic field values in Austria, repeated magnetic surveys are performed annually across the country.

The Austrian team for repeated geomagnetic surveys, Division for Geomagnetism and Gravimetry, Geophysical Department, ZAMG, spends some two months a year for the magnetic field measurements in Austria. The measurements have to be performed exactly at the same 14 points every year. Therefore, the points are well marked by non magnetic stone pillars (Fig.1).

The different components of the magnetic field vector, declination, inclination and total intensity are measured. In addition, geographic North has to be determined at the station site, to calculate the declination angle. This is done by a Gyroscope.

Since the short period magnetic variations are recorded in the field as well, in the range of minutes for instance, and which appear more or less synchronously over big regions, reference magnetic values of the Austrian geomagnetic observatory are utilized to eliminate these 'unwanted' influences.

The Geomagnetic Service, ZAMG, publishes annual geomagnetic maps and provides aviation and tourism institutions with newest charts and data. Austria takes part also in the European initiative MagNetE, Magnetic Network in Europe, for the coordination of the repeat surveys in European countries. 20 states are participating in this project. The surveys should be done in the same year and measurement procedures should get standardized. The next concerted action of MagNetE is to compile a uniform magnetic map of Europe.

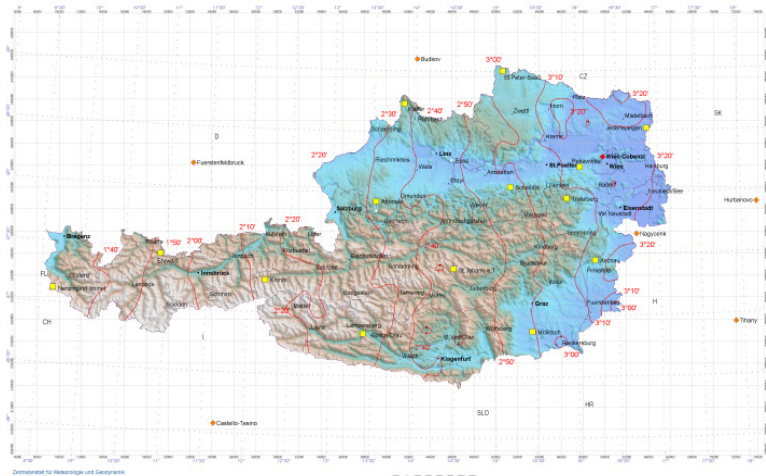
Authors:

J. Berger, G. Duma, B. Leichter
Central Institute for Meteorology and Geodynamics,
Geomagnetic Service, Vienna, Austria



Figure 1: Repeat station site in Austria, Proton Magnetometer on tripod.

Figure 2: The 14 sites for magnetic repeat measurements in Austria (yellow), Declination map 2010.



Corresponding author:

Barbara Leichter
Central Institute for Meteorology and
Geodynamics
Hohe Warte 38
1190 Vienna
Austria
Tel.: +43-1-36026-2515
e-mail: barbara.leichter@zamg.ac.at