

HISTMAG - Database for historical geomagnetic data

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The HISTMAG database comprises collections of historical as well as archeo- and paleomagnetic records. The focus was set on the integration of all relevant metadata. This information allows for the evaluation of data quality and reliability and the proper usage for geomagnetic field reconstructions. The user-friendly query form enables the convenient retrieval of desired data.

Studies of the Earth's geodynamo, archeomagnetic dating and magnetostratigraphy rely on accurate reconstructions of the past geomagnetic field. Historical data provide information about the temporal geomagnetic evolution back to the late Middle Ages. Prior to 1800, mainly declination was measured due to the application in navigation and orientation. Additional information on inclination and field intensity can be gained from archeo- and paleomagnetic measurements, which are performed to investigate the remanent magnetization of archeological objects and rocks.

The HISTMAG database comprises compilations of historical as well as archeo- and paleomagnetic records. Considerable efforts were made to extend the historical collection of Central Europe. Besides the acquisition of new data, the inclusion of all relevant metadata was given high priority. The database is accessible at the new webpage of the Conrad Observatory (<http://www.conrad-observatory.at/zamg/index.php/data-en/histmag-database>). The user-friendly query form offers the possibility for systematic search criteria as well as for keyword queries (Fig. 1). Query results, including all additional information, are displayed online or can be downloaded for further processing.

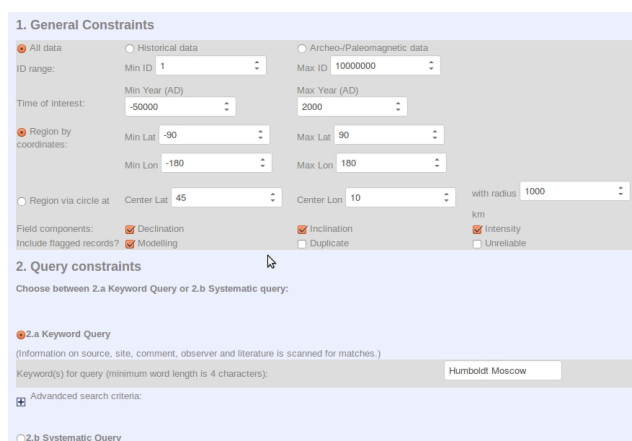


Figure 1: Online query form of HISTMAG database.

The database provides the basis for reconstructions of the geomagnetic past. Modelling approaches can benefit from the contained meta-information as one of the major obstacles for field modelling is given by the highly variable data quality. Archeo- and paleomagnetic records have been investigated for systematic bias related to materials and experimental procedures. On the other hand, information on the measurement instrument and methodology are indispensable to assess the reliability of historical geomagnetic observations. Records, acquired from different sources, e.g. historical maps, can be analyzed (Fig. 2). In this case, several records around 1700 AD, derived from compass roses printed on topographic maps, show declination values, which can be associated with older periods. This could reflect the fact, that information on declination was copied by cartographers from earlier times.

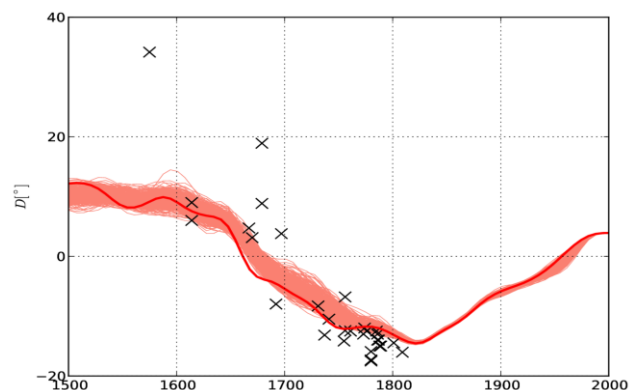


Figure 2: Modeled declination for Vienna (line) with uncertainty range (shaded area). Declination values derived from historical maps are given by the crosses.

In future, further applications will be offered on the webpage. One example will be a temporal global model of the geomagnetic field, which can be used for archeomagnetic dating purposes.

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