

## **MAGNETIC CHARACTERISATION OF SOILS IN A HISTORICAL MINING DISTRICT (HÜTTENBERG, AUSTRIA)**

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The mining district “Ferrum Noricum” in Austria can be proven to look back on a 2500 year old tradition of iron production which only ended in the second half of the 20th century. An archeometric project funded by the Austrian Science Fund (FWF) aims at the determination of the extent of Pre-Roman, Roman and medieval smelting sites in the area of Hüttenberg (Carinthia), as well as on archeomagnetic dating of excavated archeological structures. A magnetic susceptibility survey of the soils and accompanying petrophysical investigations of ore and rock samples support the geophysical modelling and interpretation. Here we present the results of a magnetic susceptibility survey of the soils in an investigation area of 4km x 4km, which was examined in a grid of 250m x 250m. The spatial variation of magnetic susceptibility values indicated several major anomalies in the study area, which could be traced back to geology or human activities. 17 soil cores of 30cm length were extracted along a profile across the entire working area in order to investigate the depth variation and frequency-dependence of the magnetic susceptibility and to identify the magnetic phases by means of mineral magnetic measurements, microscopy and Raman spectroscopy, chemical analyses (RFA) and X-ray diffractometry. The magnetic susceptibility anomalies can be related with the lithology (Siderite-Ankerite mineralisation, Mn-rich ores, serpentinite, iron-hat) and ancient industrial sites. The value of magnetic proxy parameters such as SIRM and low-field susceptibility and its frequency dependence for the characterisation and quantification of anthropogenic and authigenic magnetic phases in a complex geological environment will be discussed.

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