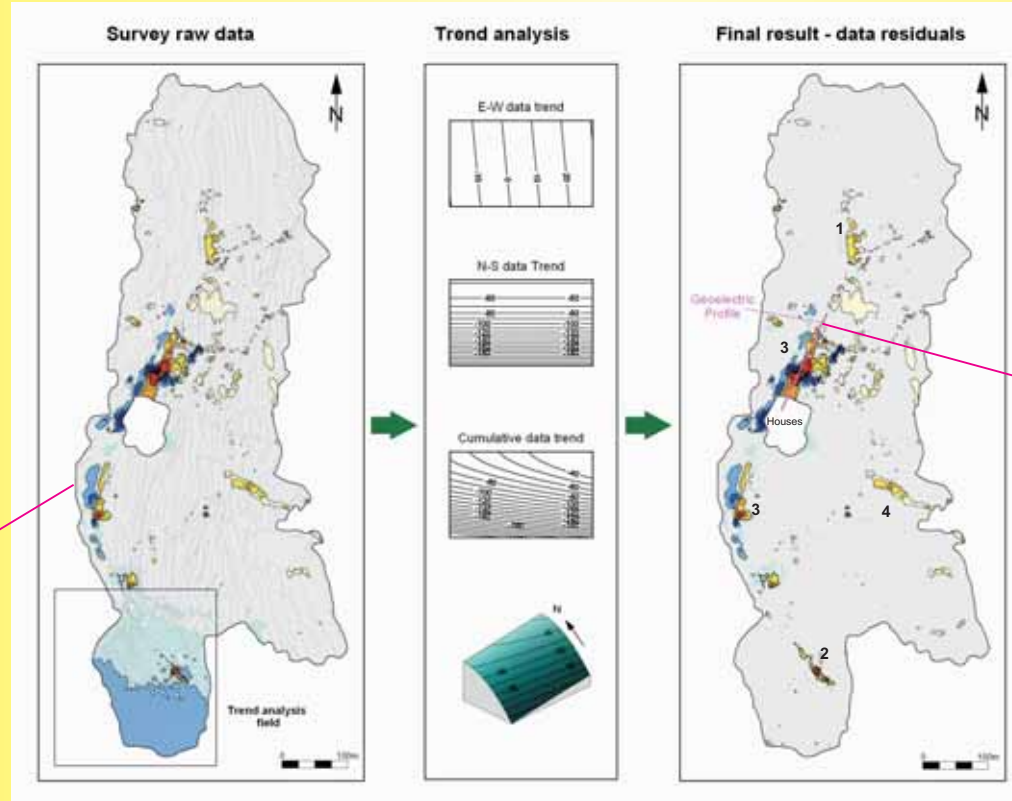


Introduction:

The area of Hüttenberg, Carinthia has long been suspected to be a center of the roman iron production between the 1st and the 4th century AD. Parts of this ancient iron industry are located at the site Sendlach-Eisner.

Excavations following geophysical prospection have shown several melting furnaces, slag heaps and walls as well as relicts of administration buildings and settlements. Due to the amount of slag finds around the excavation area a larger expansion of the whole complex can be assumed.



The magnetic Survey

Field measurement:

Area: approx. 400 x 1000m
Data: 63,700 stations
Instrument: GEM190H proton magnetometer, Walkmag
Positioning: Garmin etrex HC GPS
Base station: Geometrics G856, local

Data analysis and correction:

- diurnal correction to local base
- reduction of low quality data
- elimination of technical disturbances
- elimination of data with equal coordinates due to limited GPS resolution

Data transformation:

- Trend analysis by means of calculation of regression surfaces
- Database N-S and E-W transects in the southern part of the investigation area
- Calculation of fits with Golden Software GRAPHER data fit
- Reduction of strong quadratic N-S trend and a slight linear E-W trend as shown above.
- Residuals used for the final presentation of the data
- Calculation of the resulting grid with Kriging using Variograms

Results:

The major variations in the center part of the survey represent the existing excavation district. Indications for additional zones were subsurface monuments can be assumed are in the north (1) and in the south (2). The southern anomalie has been confirmed by former geomagnetic measurements. The huge slag heap (3) can be tracked along the western border of the investigation area. Another interesting result is the semi-circular structure east of the excavation area. Further anomalies (4) are caused by geological reasons (e.g. mineralization).

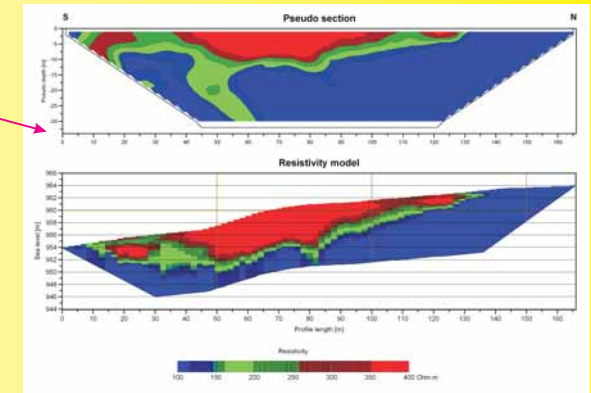


Walkmag field measurement

The geoelectric multielectrode profile

The depth of the major slag body in the western part of the survey area was determined with two multi electrode geoelectric profiles. The North-South profiles had a length of 166m and an electrode distance of 2m. With a maximum penetration depth of about 30m 1134 Wenner-Alpha resistivity stations has been recorded for each profile. The distribution of the resistivity is shown in the pseudo section below.

The aim of the investigation was the estimate of the slag volume, which gives an evidence for the duration of the industrial iron production.



The resistivity model shown above indicates a high resistivity body, which is clearly delimited from the low resistivity bedrock. The maximum depth of about 6m fits well with the assumptive historical paleosurface. The thinning of this body to both ends of the profile is consistent with the magnetic data.



Geoelectric profile over the slag heap

In the southern part of the profile a smaller body is separated, which is likely to a later encroachment into the sub-surface.

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