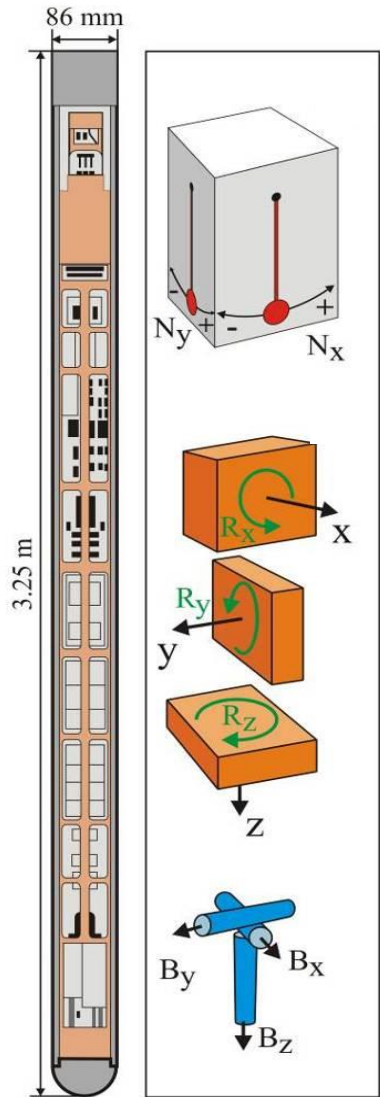


3-C magnetometer for mineral exploration in boreholes

- Thematic Areas/Technology/Topic of focus + key elements of the idea/problem:
Develop 3-component (3-C) fluxgate magnetometer for mineral exploration in slim boreholes based on prototype at TU Braunschweig and University of Göttingen.
- Expected synergies and complementarities:
Simultaneous low-noise 3-C magnetic potential field and magnetotelluric (MT, signal frequencies ≤ 1 Hz) measurements with highly accurate sensor orientation (unique). Magnetic data explore local mineralization. MT data explore unknown mineralizations at > 500 m depth and crustal/mantle sources of mineralizations (regional scale).
- Outcomes:
New 3-C magnetometer ready for marketing, verification using field measurements and modelling.
- Market & Business opportunities:
Unique system for simultaneous (time- and money-saving) magnetic potential field and MT measurements directed towards exploration industry. Potential use in controlled-source electromagnetic (CSEM) methods.
- Partners already identified:
Uppsala University, Technical University Braunschweig, University of Göttingen (discussed), LKAB (discussed), Boliden (contacted).
- Wanted additional partners :
Instrumental manufacturer specialized in borehole systems. TU Freiberg for CSEM part. Other CLCs.

3-C magnetometer for mineral exploration in boreholes



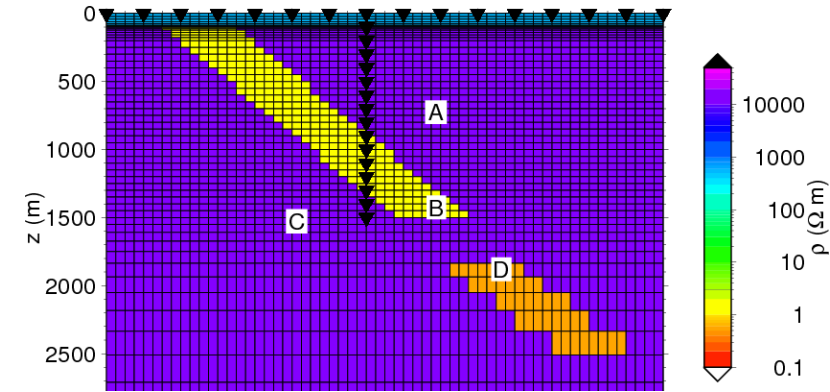
Steveling
et al., 2005

Tilt-meter

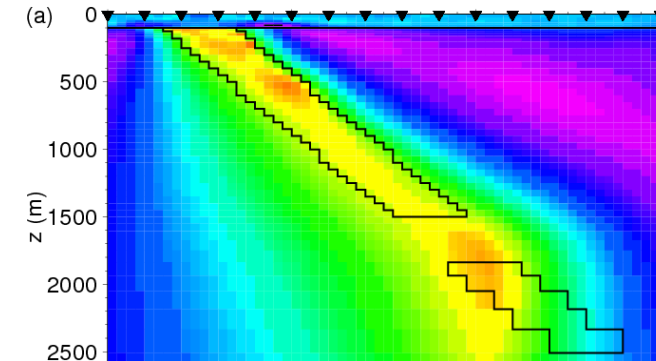
Fibre optic
gyroscope

Fluxgate-
magneto
meter

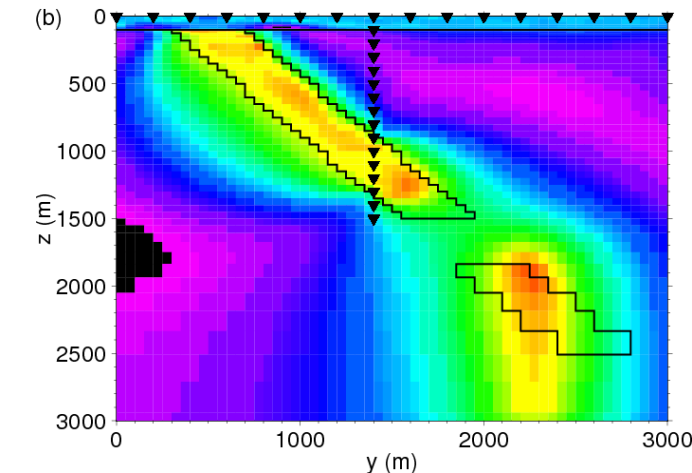
In Outokumpu:



Synthetic 2D
resistivity
model with
dipping
mineral
deposits



Inversion model from
surface MT data (Rx-
black triangles)



Inversion model from
surface and borehole
MT data

Kalscheuer et al., 2018