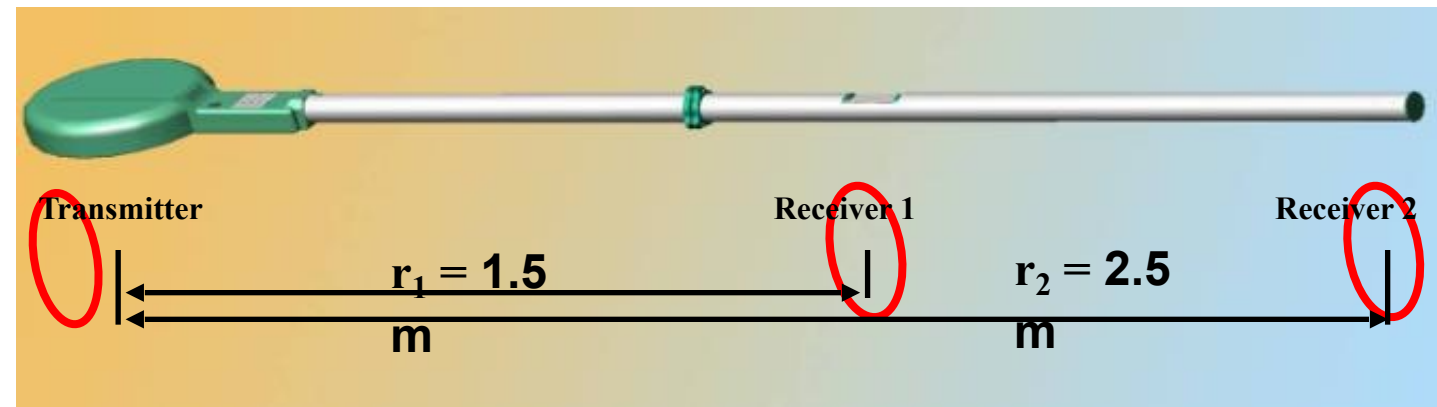


Apparatus for electromagnetic profiling (up to 10 m) subsurface survey

Sounding with alternating electromagnetic fields has gained a growing attention and a broad usage during the last three decades, including Frequency Domain Electromagnetic Induction (FD-EMI) sounding methods.



The AEMP-14 is intended for shallow-depth (up to 10 m) subsurface investigations. Essential experience is gathered at the following applications:

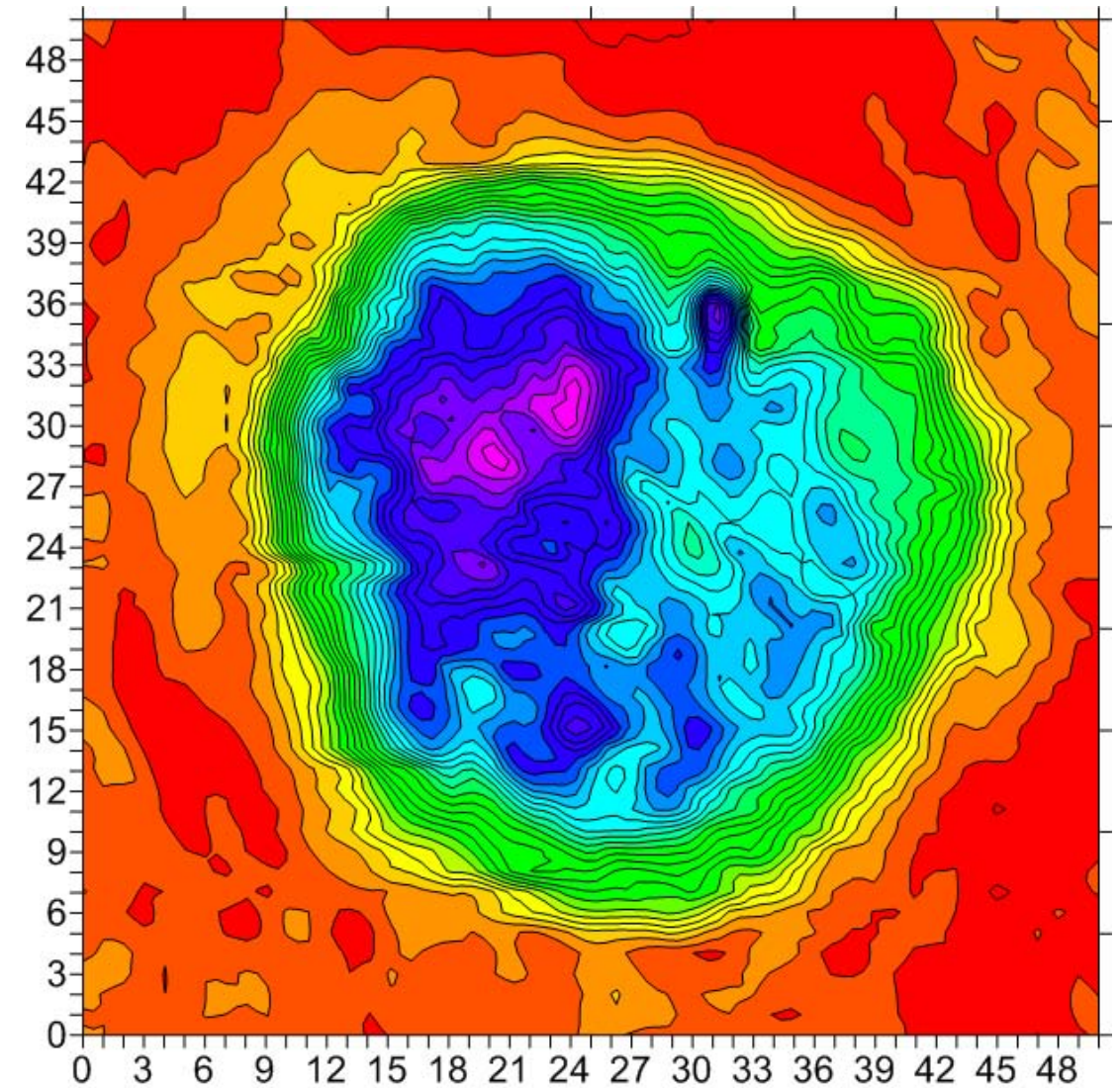
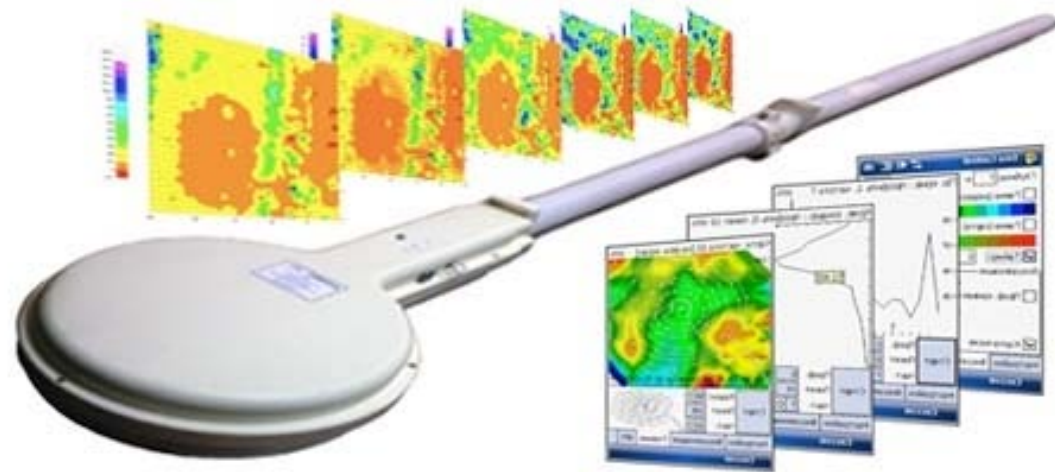
- Archaeological targets search and examination;
- Ground water flows mapping;
- Subsurface communications and objects tracing;
- Subsurface pipe leakage determination;
- Ground water contamination study.

The main features of current AEMP-14 are:

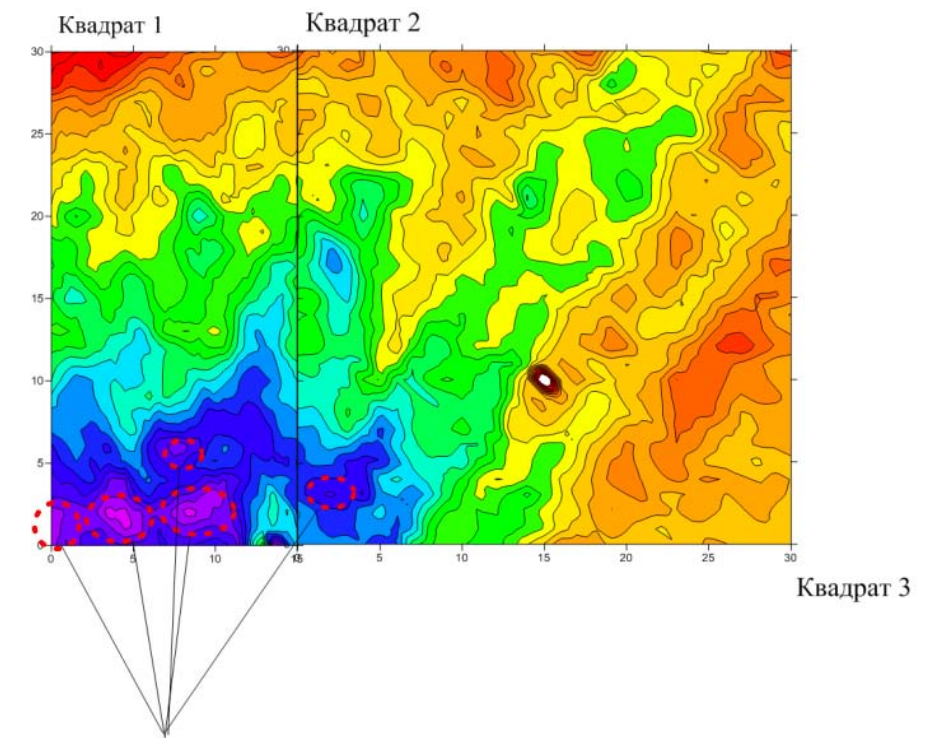
Device dimensions:	2.75 x 0.3 x 0.15 m
Device weight	8 kg
Frequency range	2.5 – 250 kHz
Number of frequencies	1-14
14-frequencies sounding time	2 sec



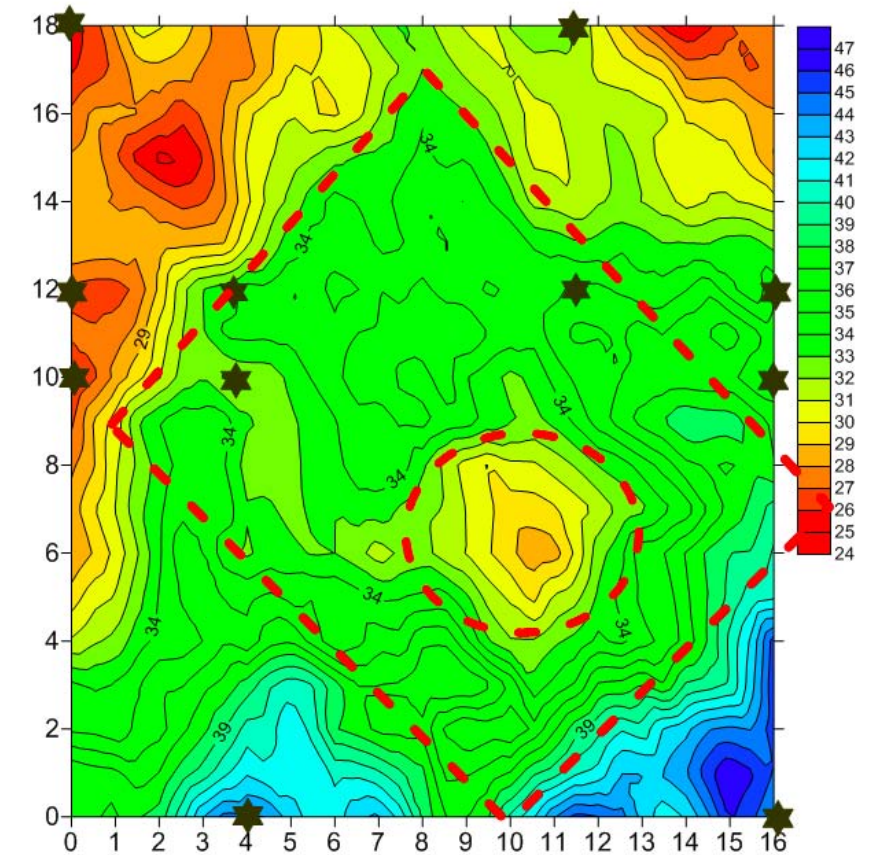
Developed and tested by Russian Academy Science Institutes from 2002 year.

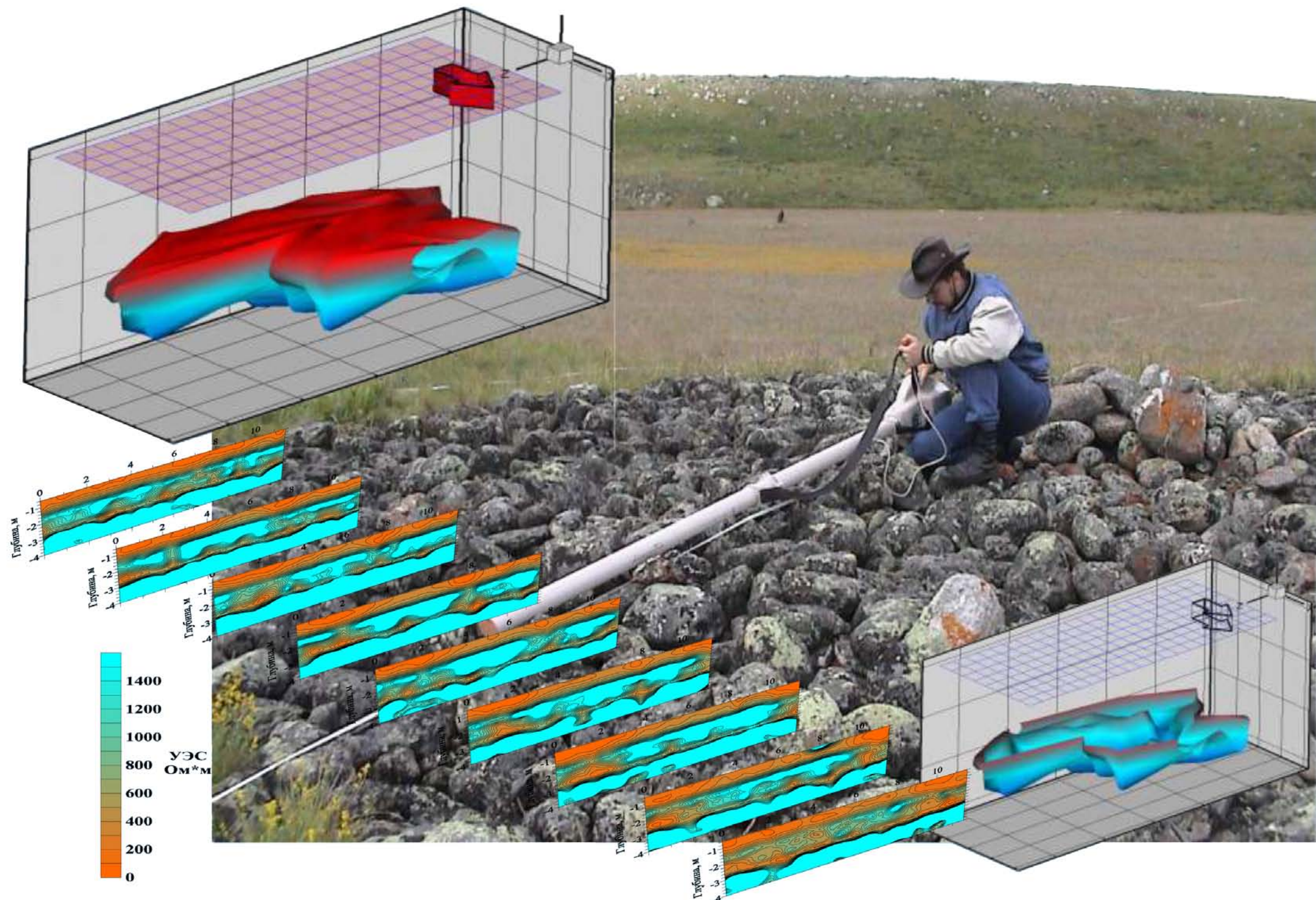


Internal structure of a burial mound in Mongolia

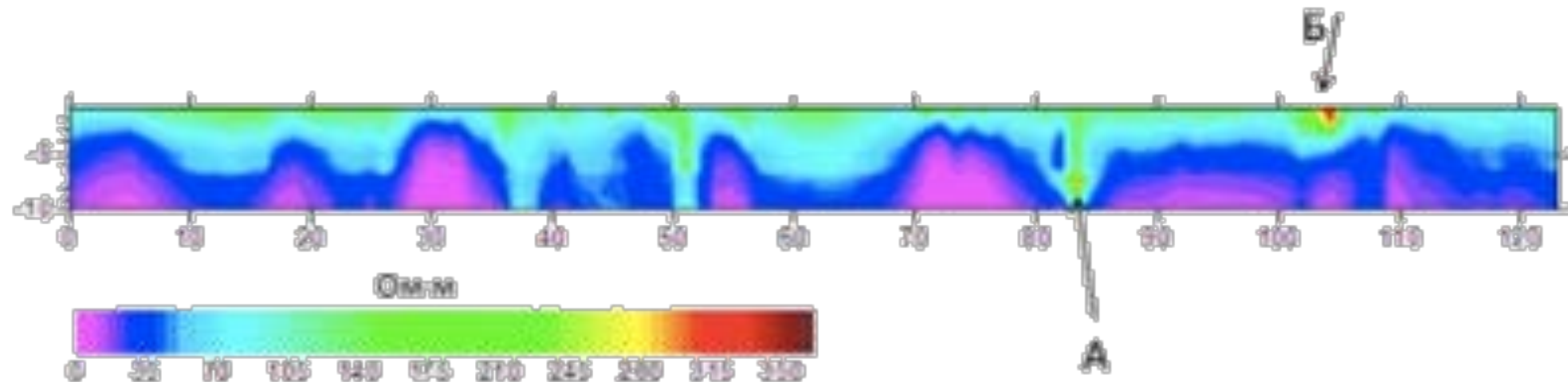


Possible grave places





Internal structure of the frozen area analyzing



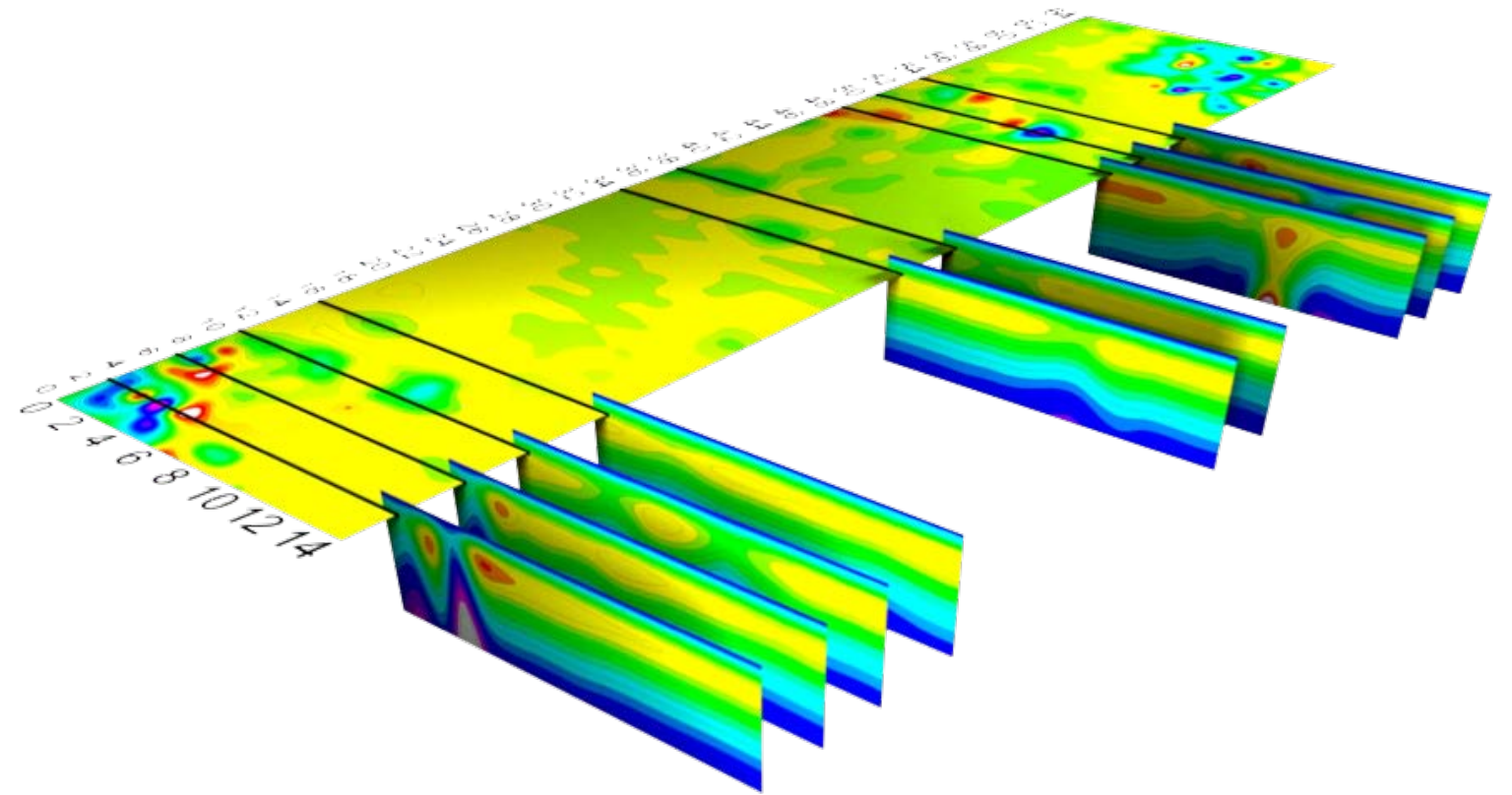
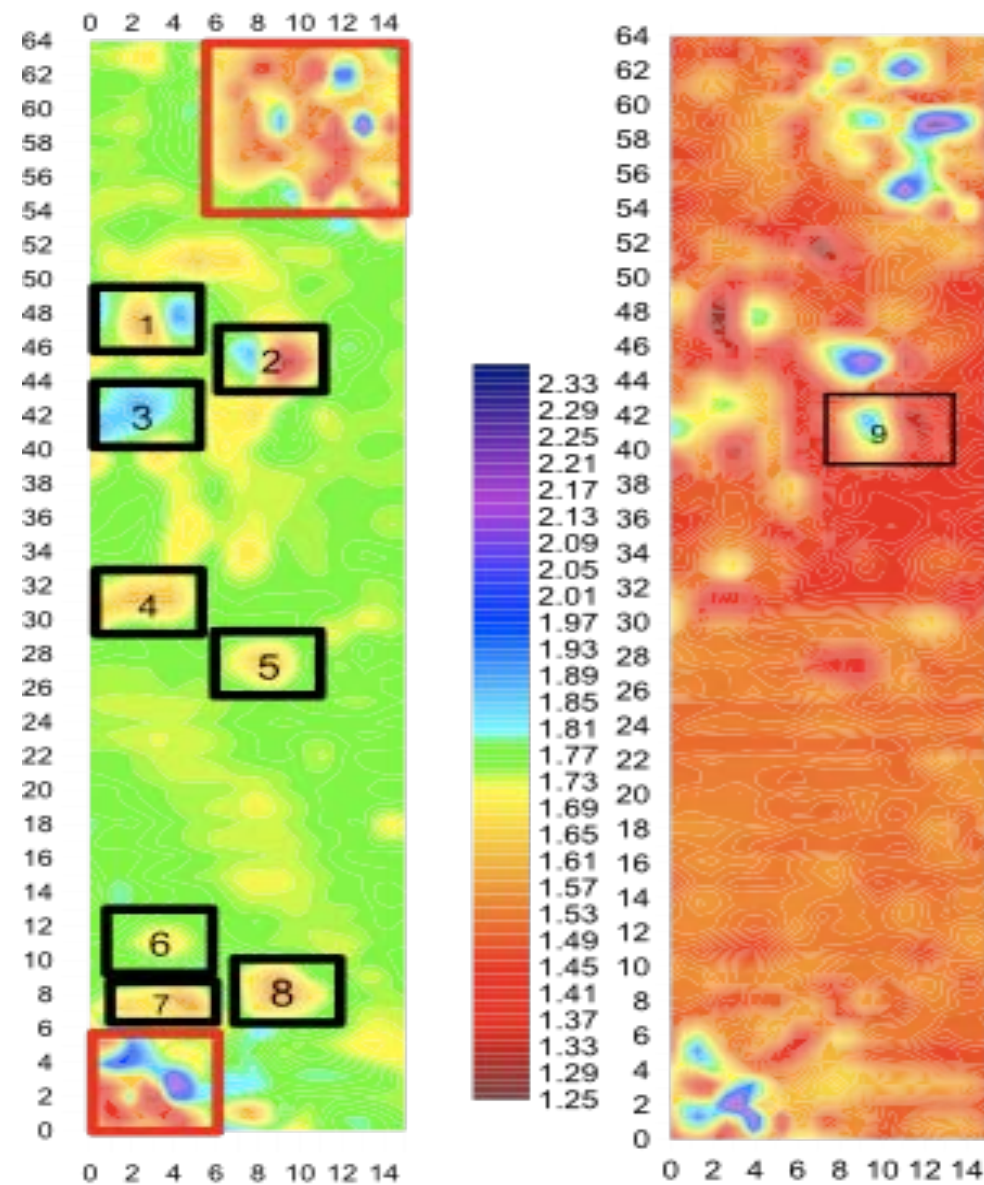
Search for saps on the territory of jail.

Low resistivity anomalies at 30 and 75 m are confined to a metal gate.

High resistance anomaly (A) is caused by a known old sap at a depth of 2-3m.

High resistance anomaly (B) is at a shallow depth of 1-2m.

Anomaly localization on sites before construct the buildings

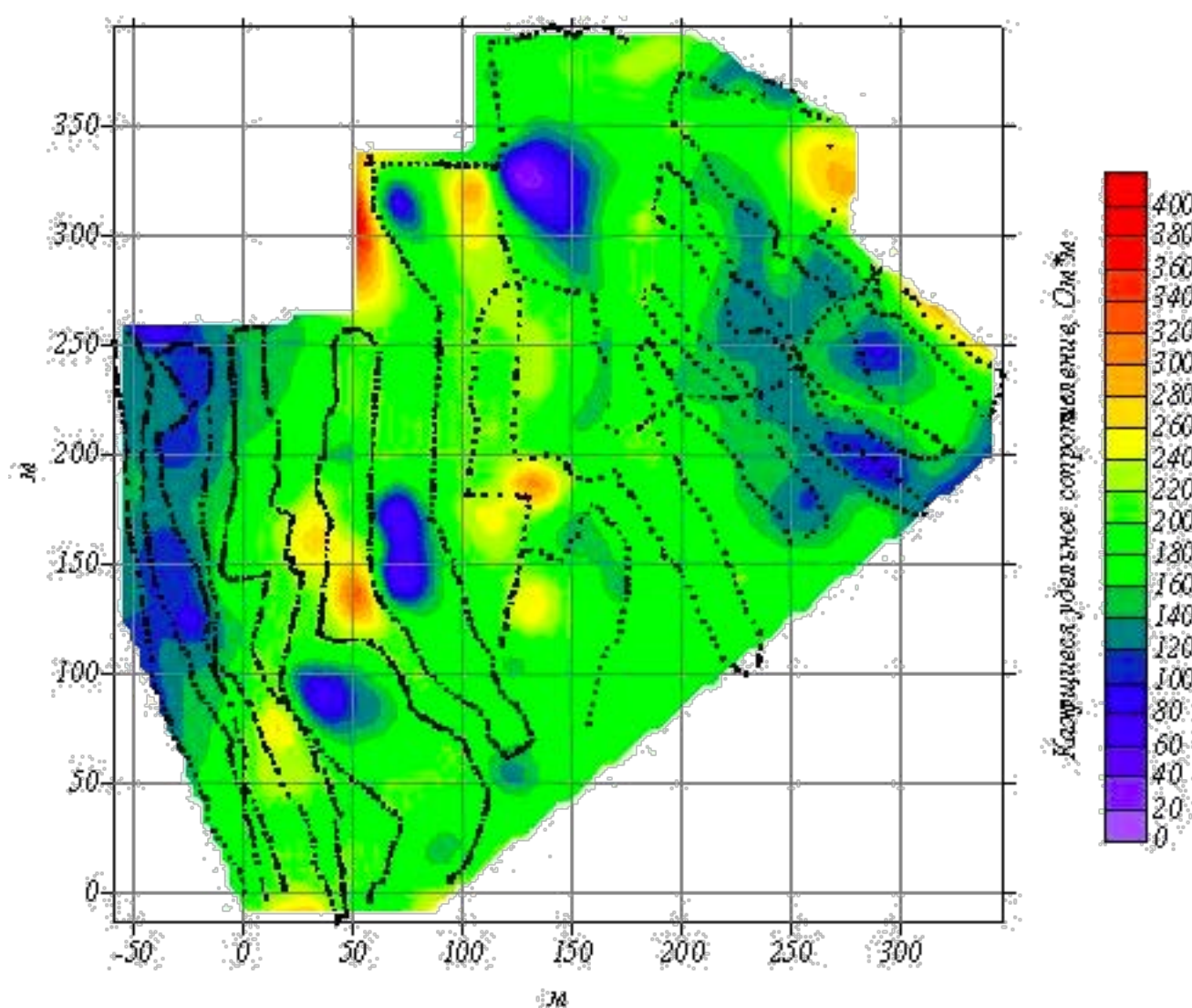


Data spreading from 5KHz (right) and 40KHz (left) frequencies represented in log of apparent resistivity.

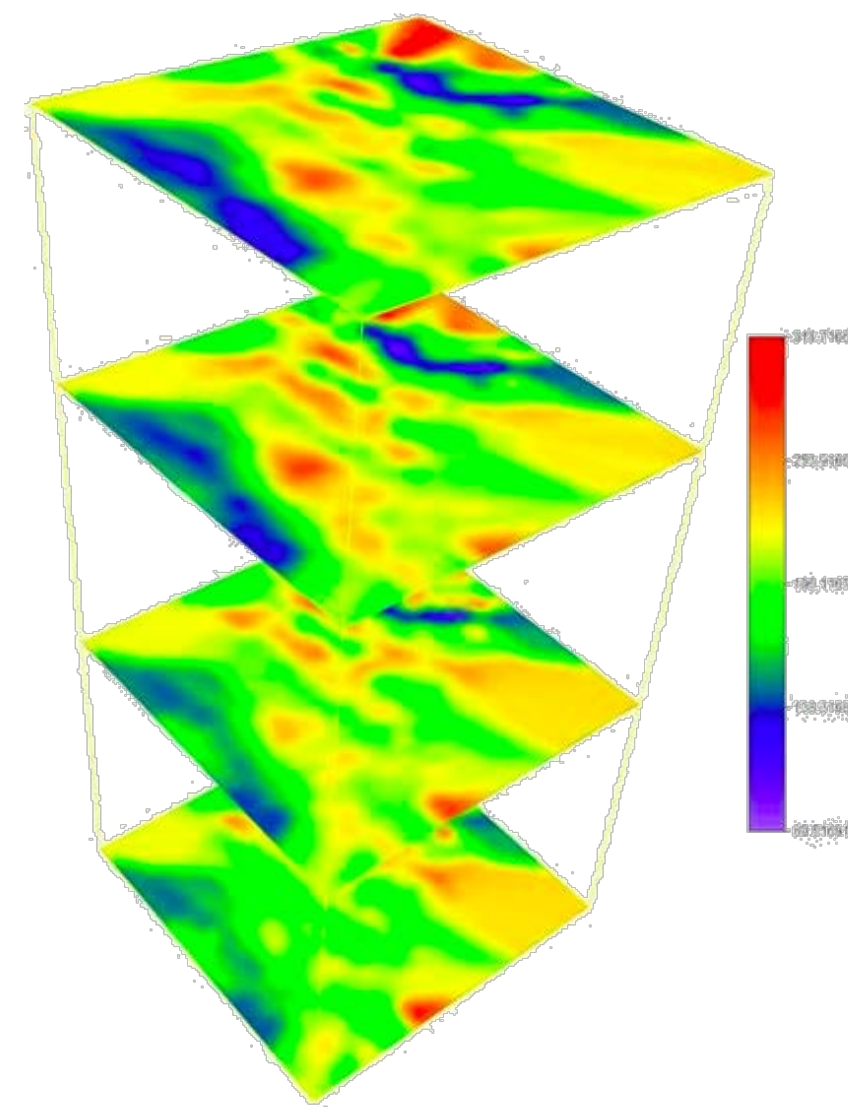


Ob river right coast was explored using AEMP-14 in GPS data binding mode to explore the shallow depth boundary of ledge rocks. The number of records 1470. The map of electric resistivity distribution at the depth of 1 m (62.5 kHz) with data reading points shows few spots of high resistivity that corresponds to the ledge rocks. The four maps of lower frequencies corresponds to 3-7 m of depths depict the shape of ledge rocks in quazi-3D visualization

Field works takes 4 hour, data processing 40 min.



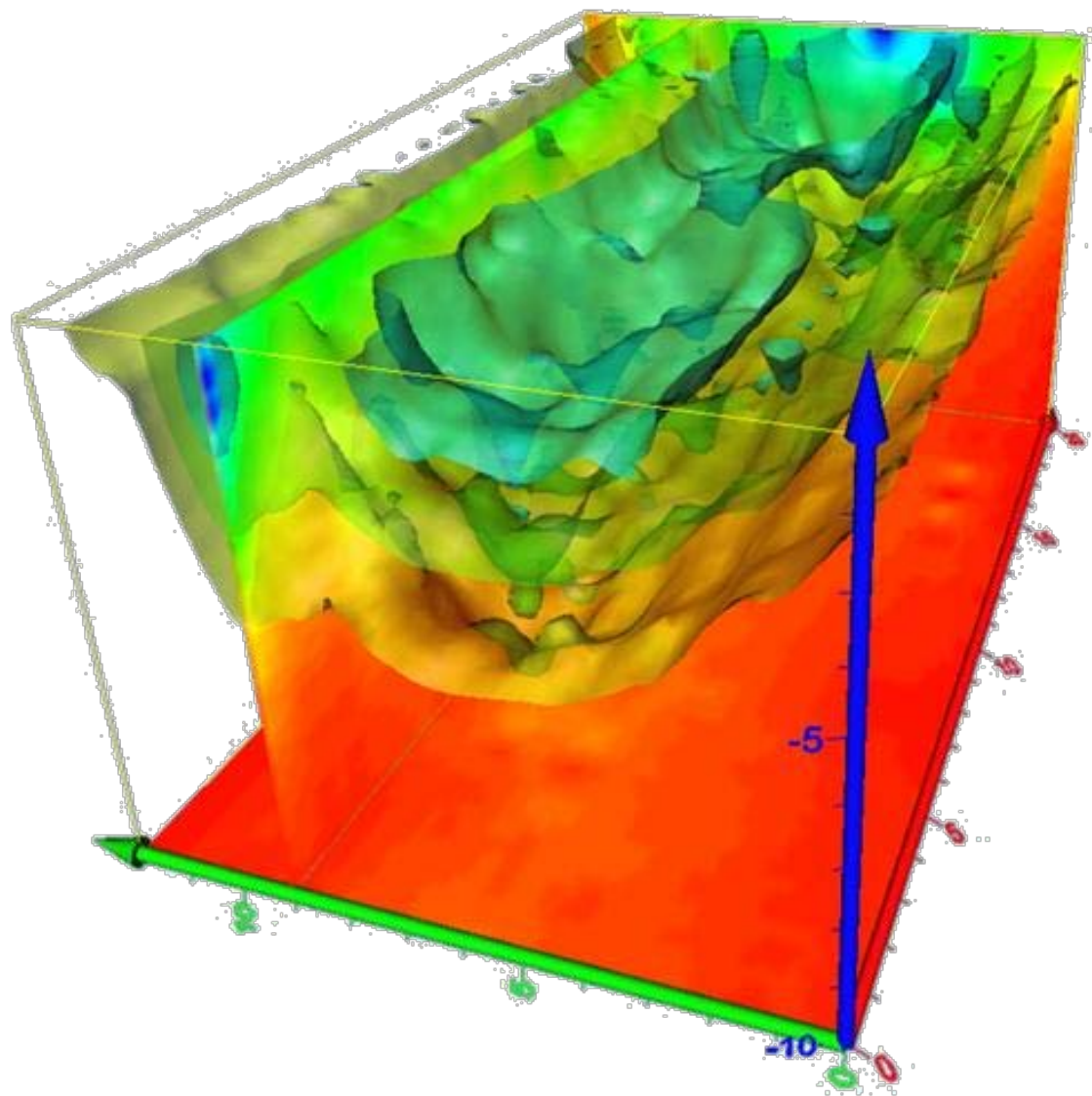
2D electric resistivity distribution.
Frequency 62.5 kHz



Pseudo-3D electric resistivity distribution.
Frequencies: 40; 20; 12 and 4 kHz

Frozen ground exploration. The site size 12 m x 30 m. The season frost is shown by blue 1200 Ohm*m izosurface (the upper one), yellow izosurface (50 Ohm*m) shows the ground water level.

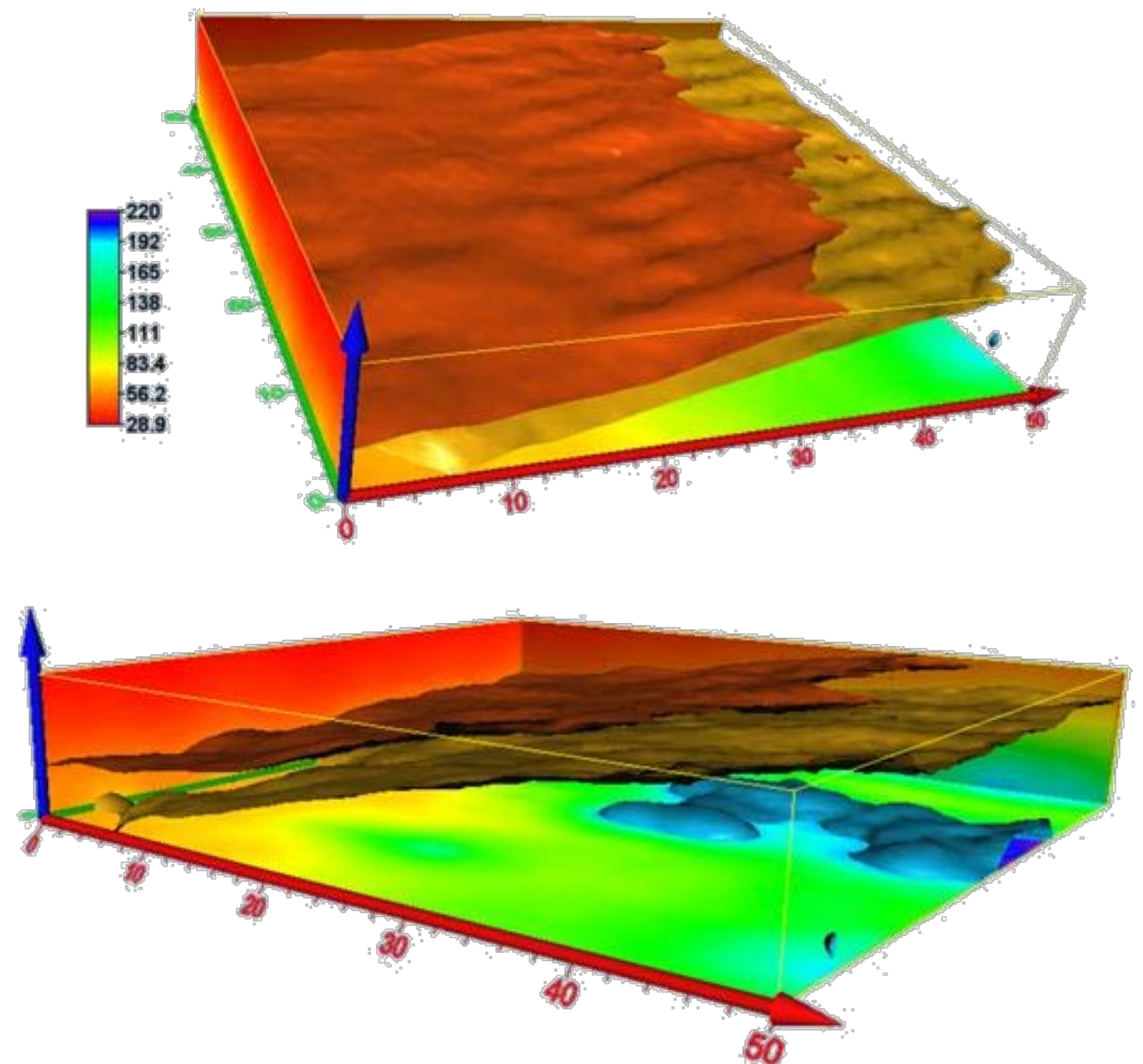
Field works takes 1 hour, data processing 10 min.



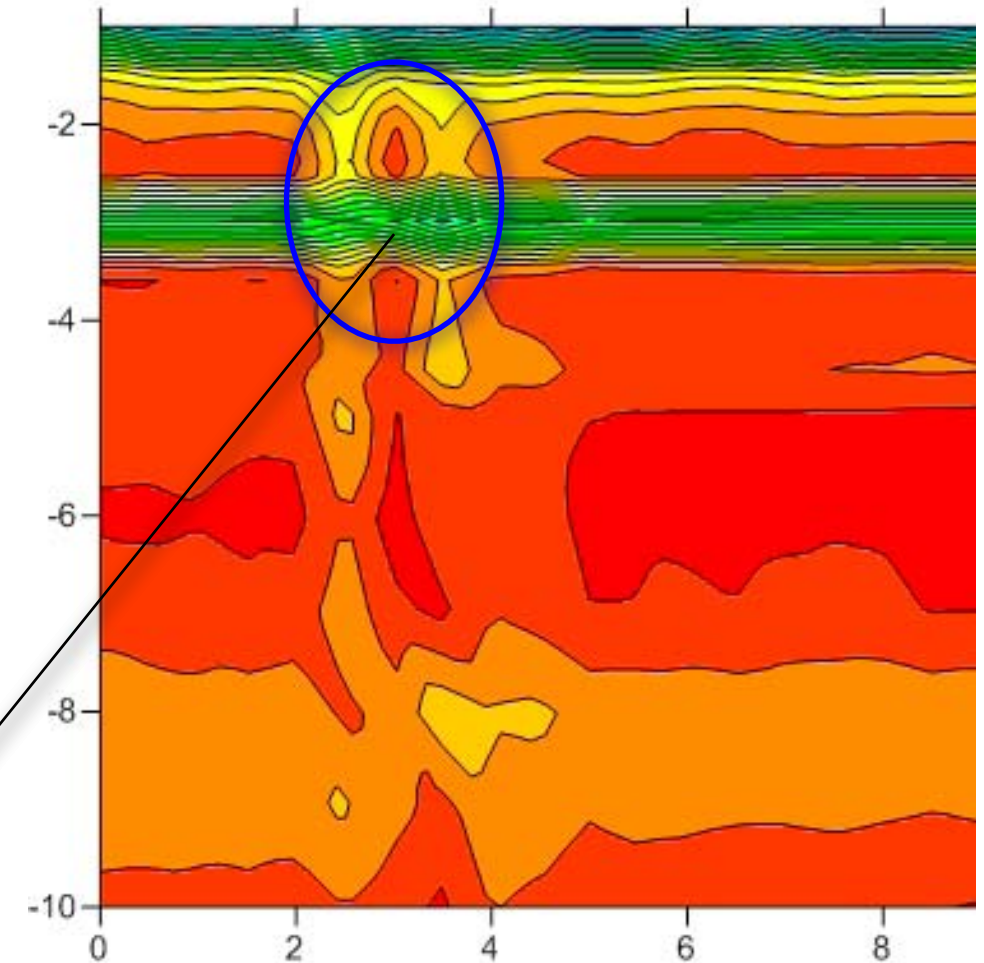
3D electric resistivity distribution for frozen soil analysis

Construction building site 50 m x 55 m is situated at the swamp. The upper izosurface shows water/silt boundary, second – silt/sand boundary. Resistive (blue) izosurface corresponds to the gravel.

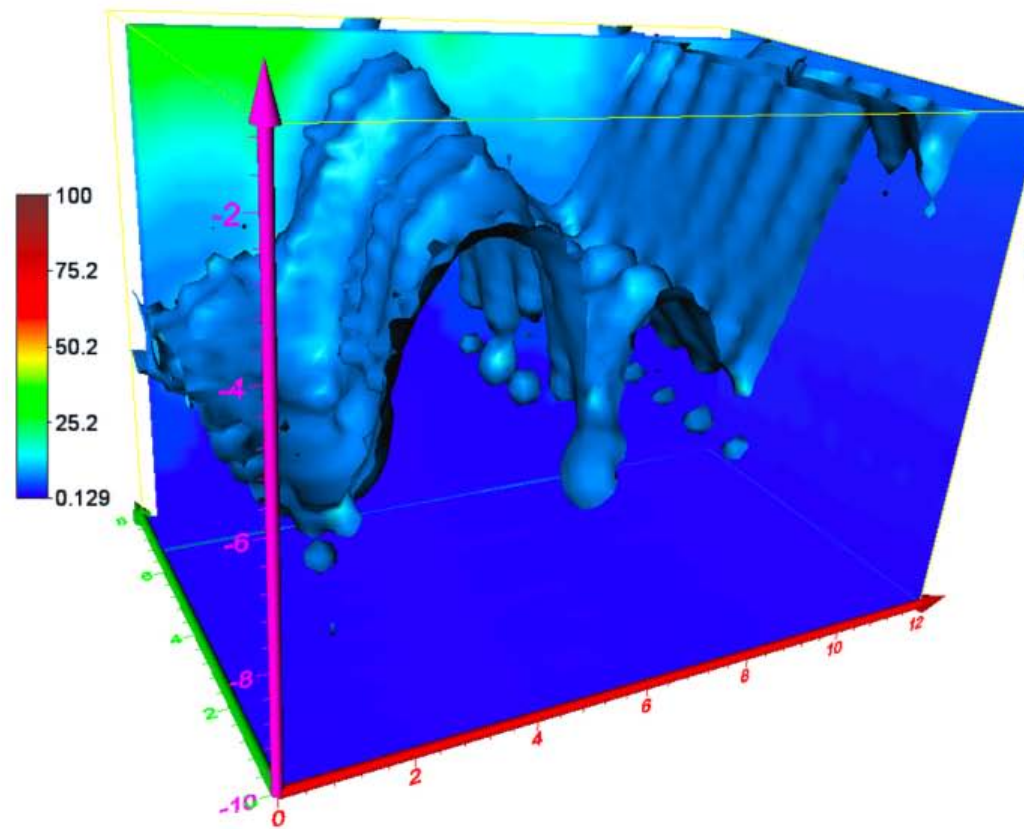
Field works 3 hours, data processing 20 min.



3D electric resistivity distribution in construction building site subsurface



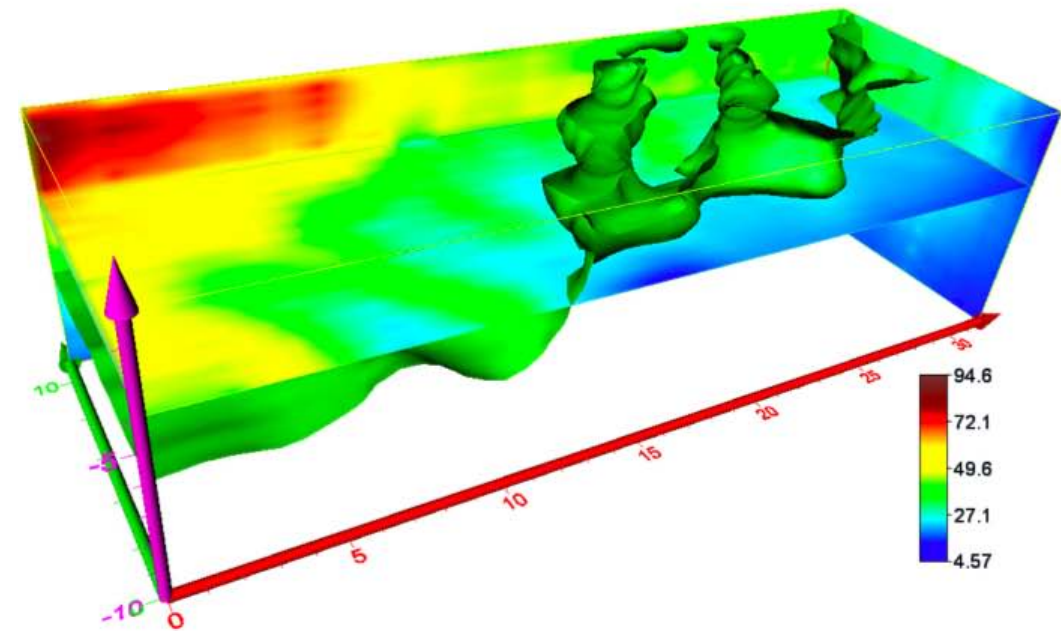
Cave entrance detected on 2m depth



Measured area 12x8 m:

- heat pipe 250mm - depth 3,5m;
- water pipe 150mm – depth 2,5m;
- gas pipe 100mm - depth 2m;
- cable 50mm - depth 0,7m.

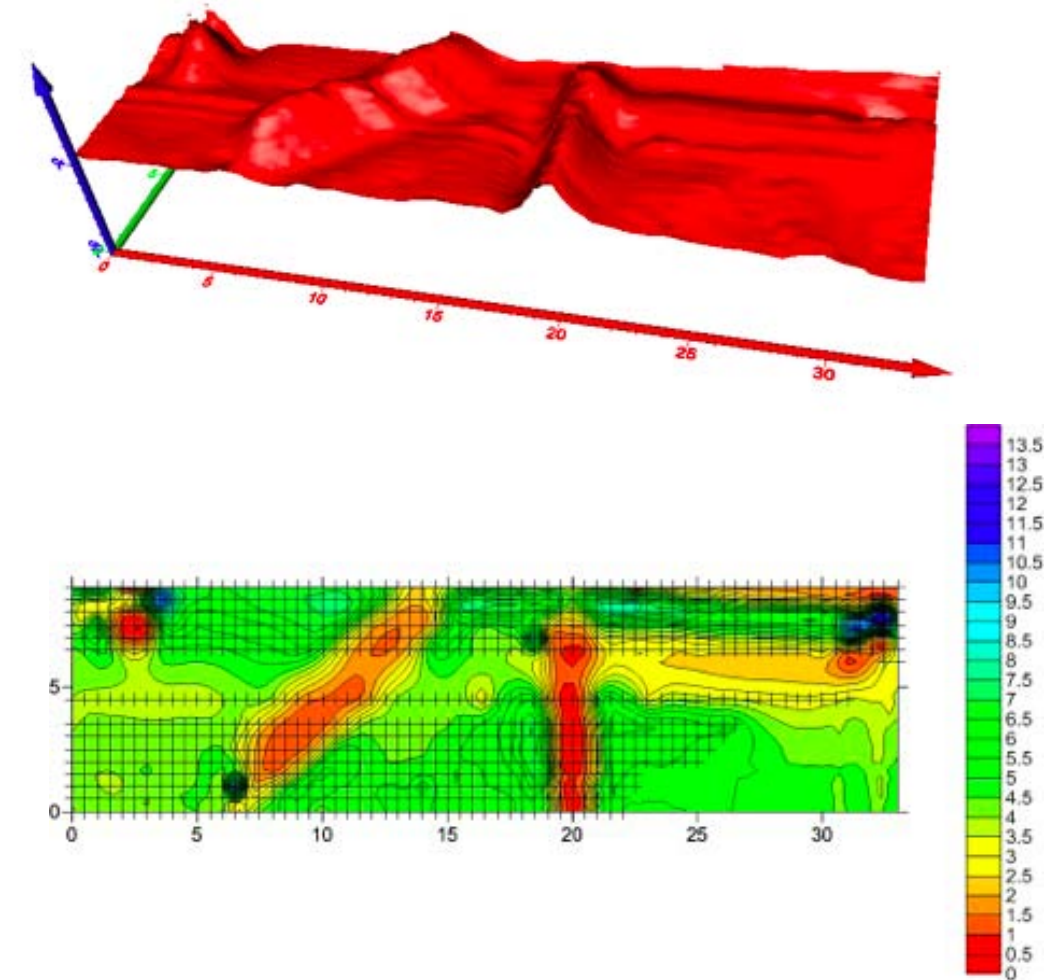
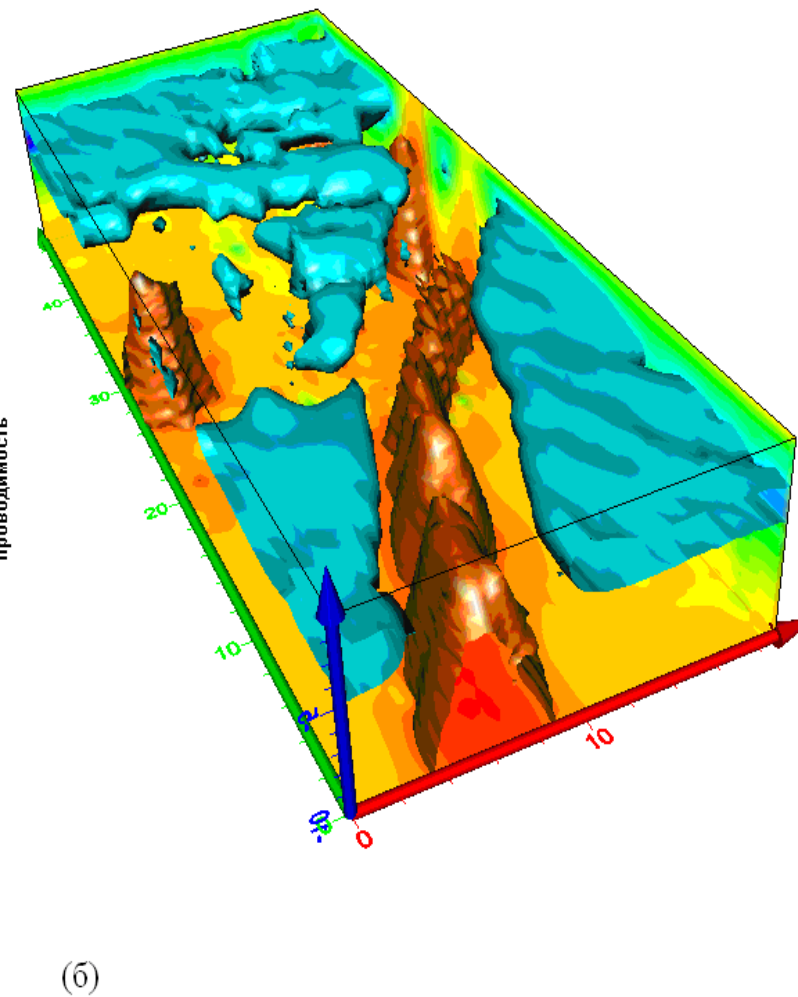
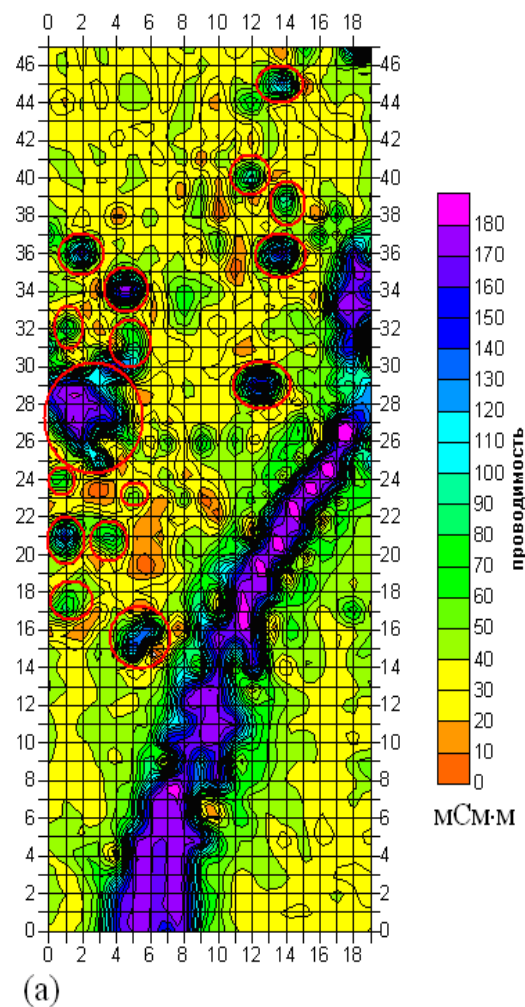
**Field works takes 1 hour, data processing
10 min.**



Measured area 34x11 m:

- Cable and pipe 50mm - depth 0,5m.

**Field works takes 1.5 hour, data processing
15 min.**



Measured area 48x20 m:

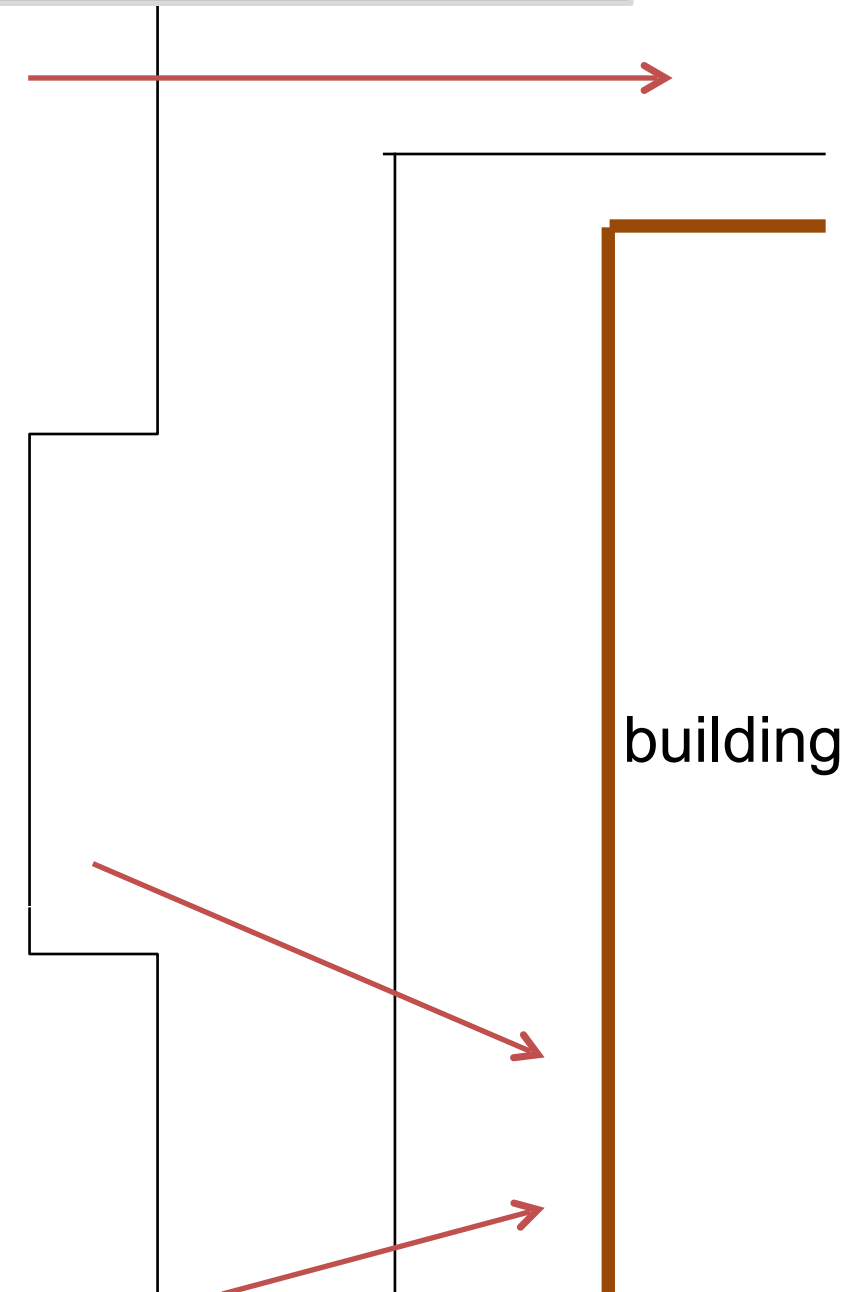
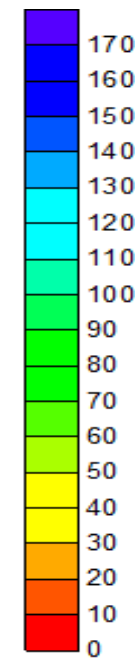
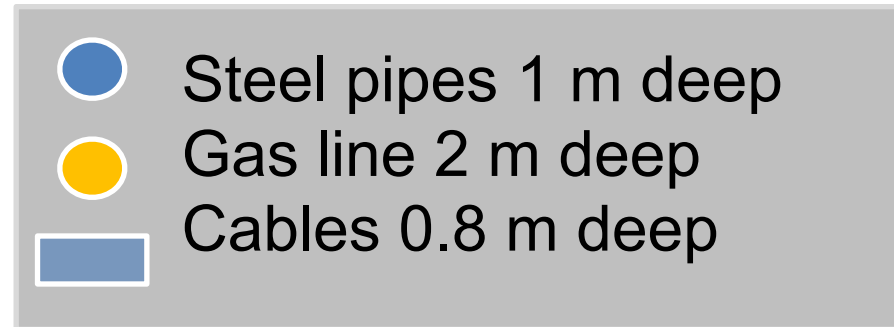
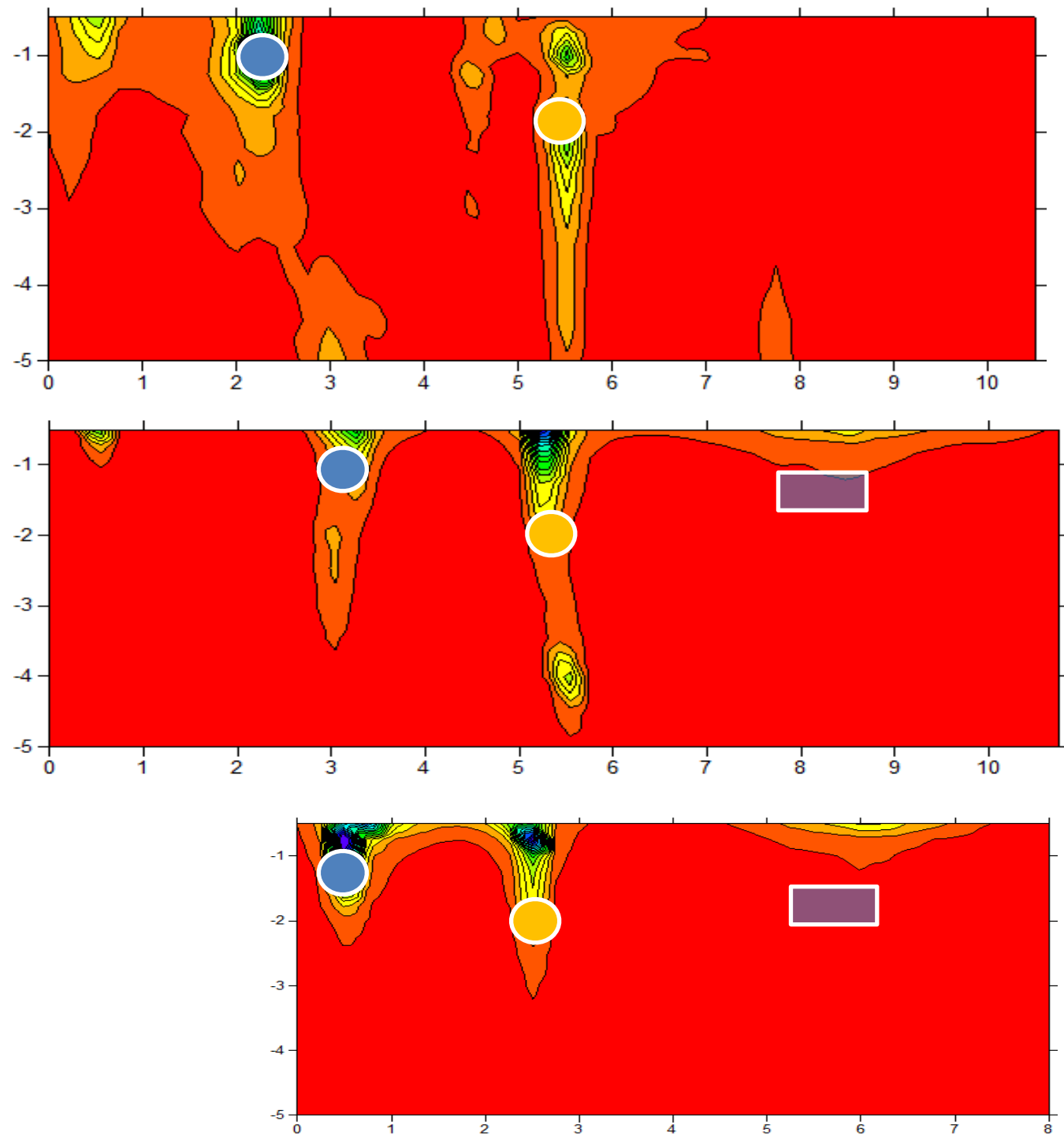
- big pipe and metal object detected;

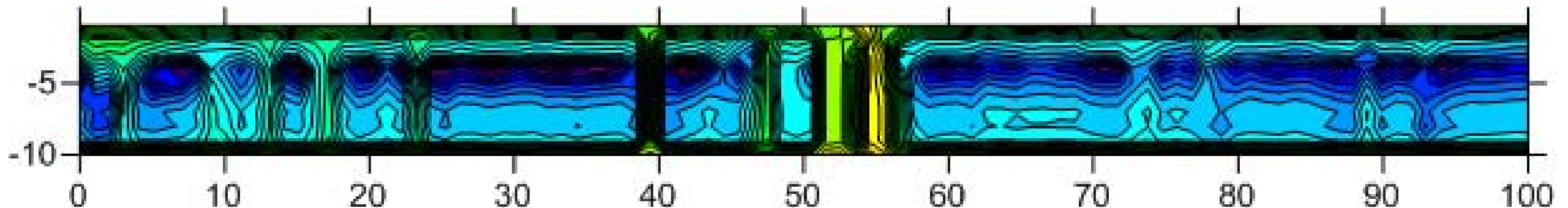
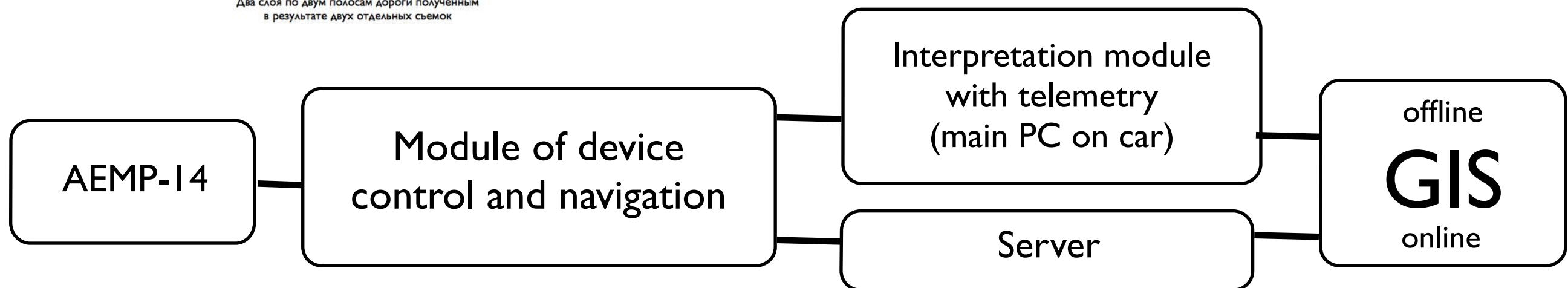
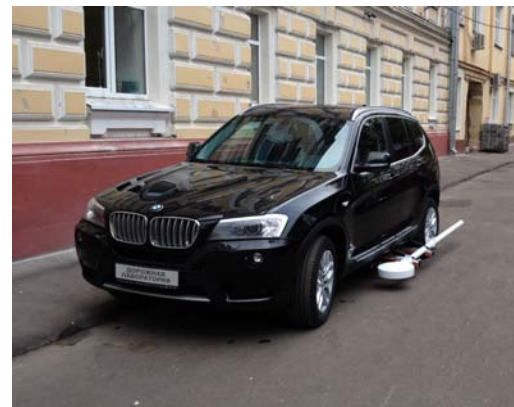
**Field works takes 2 hour, data processing
15 min.**

Measured area 33x9 m:

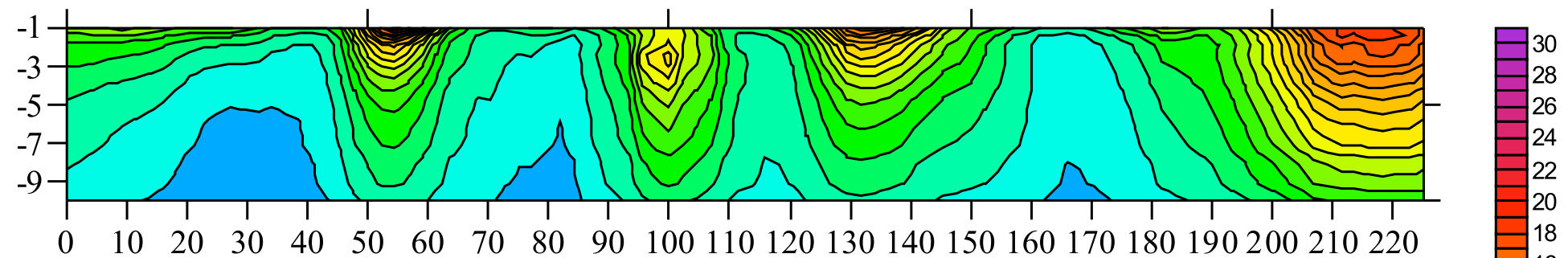
-Cross pipes detected into main trace.

**Field works takes 0.5 hour, data processing
10 min.**

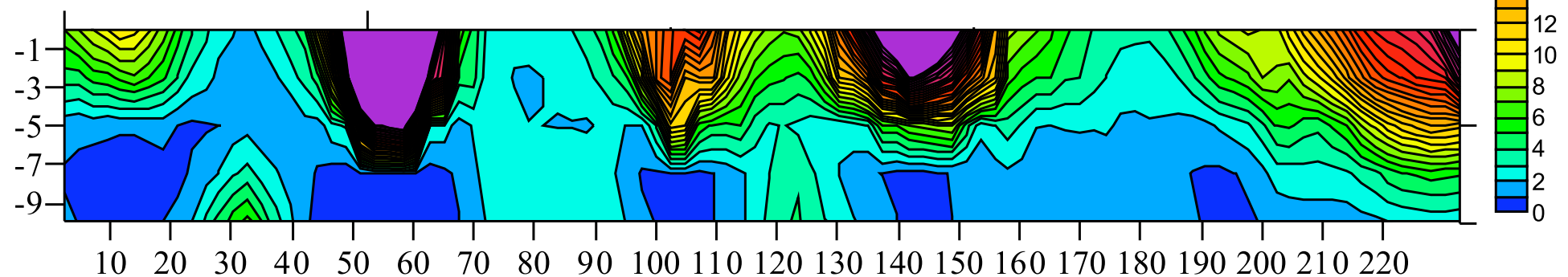




Results from AEMP-14



Results from Siber-48



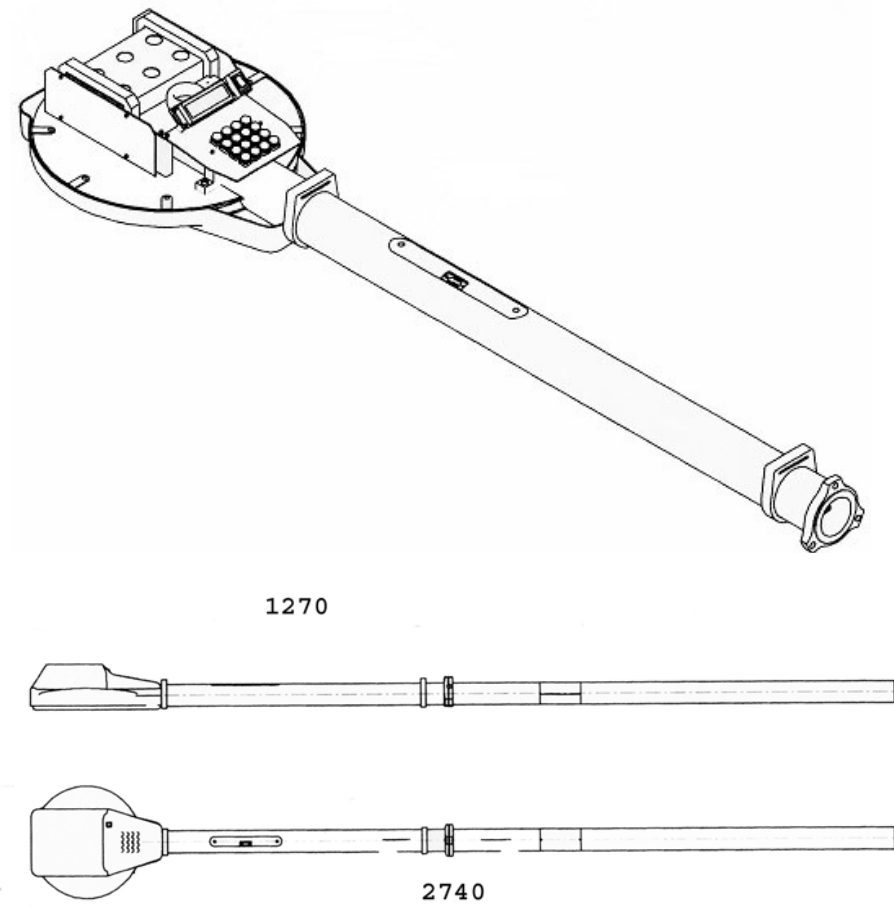
As we can see - complex data is same in main quality.



Mutnovsky vulcano helicopter view

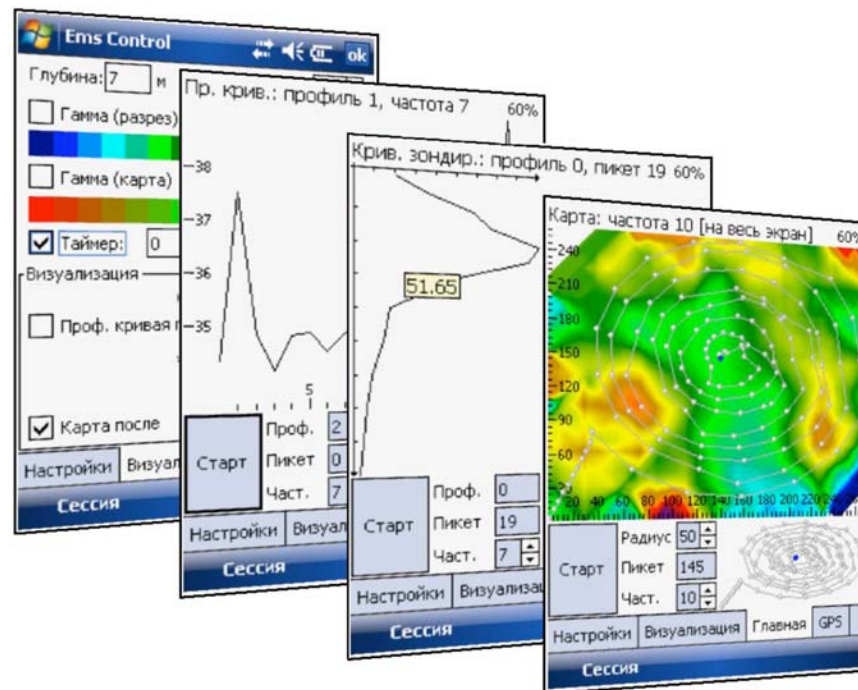


Field measurement on Mutnovsky vulcano with AEMP-14 and Siber-48

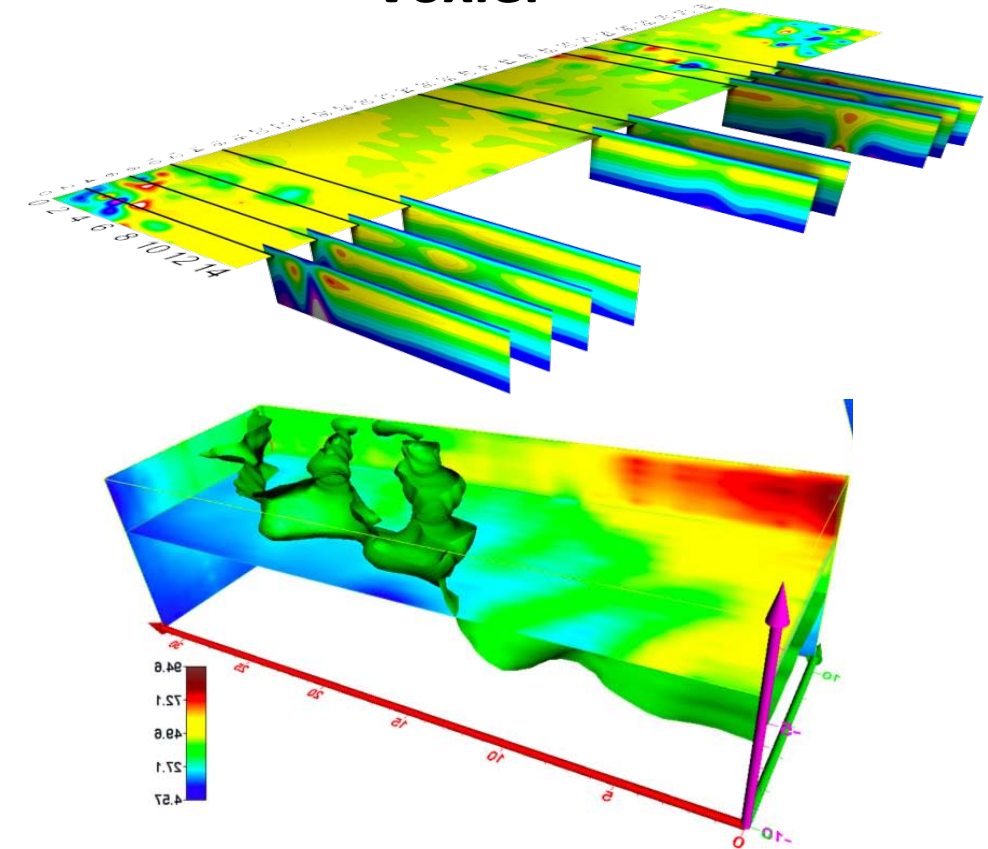


EMSControl

Windows embedded handheld
Windows mobile 6.0-6.5

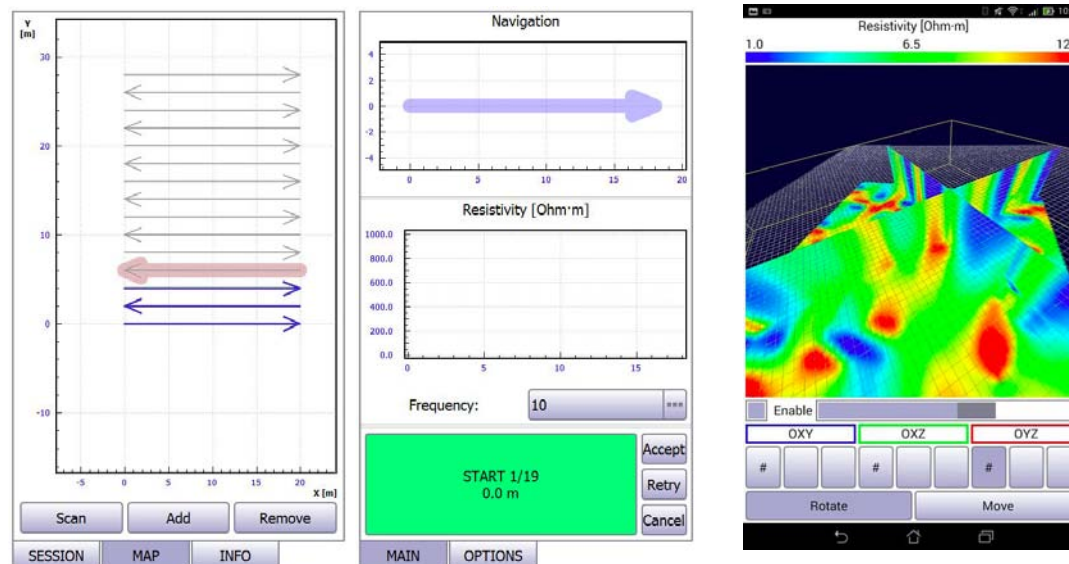


iSystem + Surfer
Voxler Windows PC

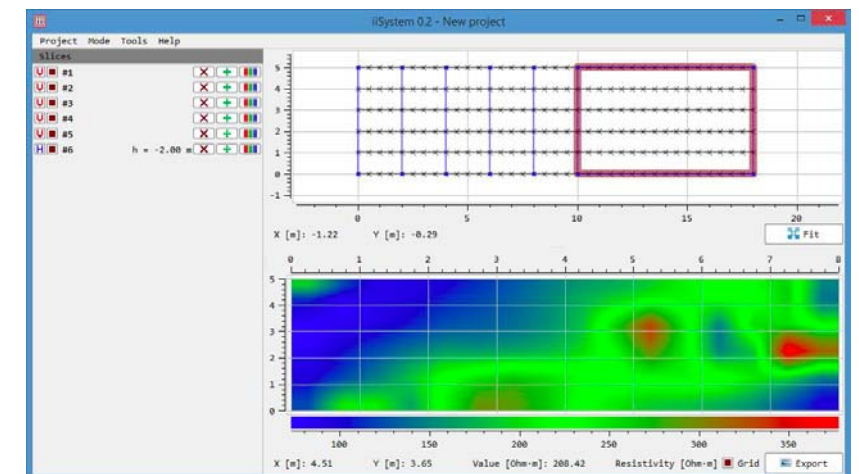


QZond

Android 4.2 and higher



iiSystem Android 4.2 and higher



visualization and export to Surfer and Voxler