

Example of Schlumberger, dipole-dipole and pole-dipole joint inversion using EarthImager 2D.

Survey: Electrical resistivity data, recorded in Kenya 2006 for ground water exploration.

Instrument: SuperSting R8/IP with 84 electrodes at 20 meter spacing.

Electrode array: Combination of dipole-dipole, Schlumberger and pole-dipole.

Processing: Joint inversion using the EarthImager 2D inversion software.



EarthImager 2D Features:

- 2D resistivity and IP inversion software.
- 2D ERT (electrical resistivity tomography) between two or more boreholes.
- Survey planner with graphical model input, forward modelling and virtual survey with actual command file.
- Inversion of marine continuous resistivity profiling (CRP) data.
- Inversion of resistivity data collected with underwater electrodes.
- Creation of command files for non-standard and mixed arrays.
- Inversion of resistivity data collected with non-standard and mixed arrays.
- Multi-lingual support with English, Spanish and Chinese captions.
- Time Lapse inversion option for resistivity monitoring from the surface and between

- bore holes.
- Automatic identification and removal of noisy and erroneous data points.
- High definition report quality plot style print-out.
- Topographic correction and print-out of resistivity section with topographical features.
- Finite difference and finite element modelling.
- No software limit on number of data or number of electrodes.
- No limit on array type or electrode location.
- User friendly Windows GUI.
- A priori information input.
- Real time scrolling through all iterations using the mouse wheel, creates "movie like" animation.
- Seamless operation with AGI resistivity instruments.
- Accepts manual data input and from .dat files.
- Windows true type font and true 24-bit color.

2D Resistivity Inversion

Reads Sting data (and other instrument data formats) and produces a default setting inversion, valid in most cases, after only a few clicks. For advanced processing there are a number of settings for full user control of the inversion process. Report ready high definition graphic output in the form of engineering plate style drawing with title block.

2D Electrical Resistivity Tomography (ERT)

The software automatically detects bore hole data set for immediate ERT processing. There is an editor for "bad" electrode and "bad" data removal. From iteration to iteration the data misfit is displayed in a scatter plot. There is also a data cross plot (raw versus inverted apparent resistivity data) available as well as a diagram showing the convergence curve.

Time Lapse Monitoring

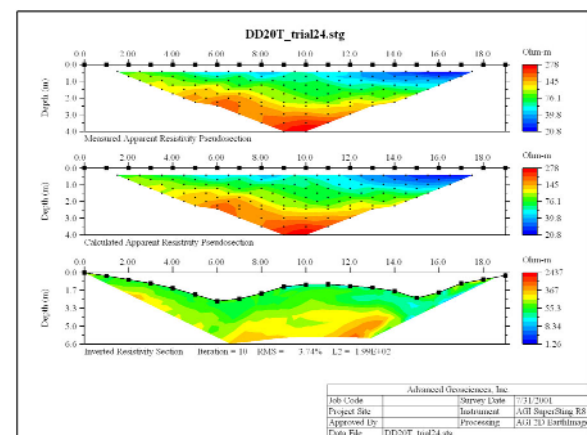
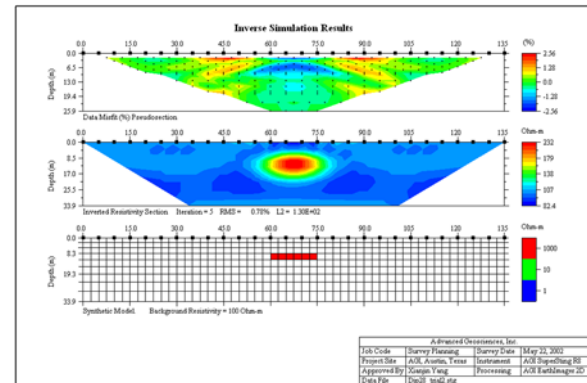
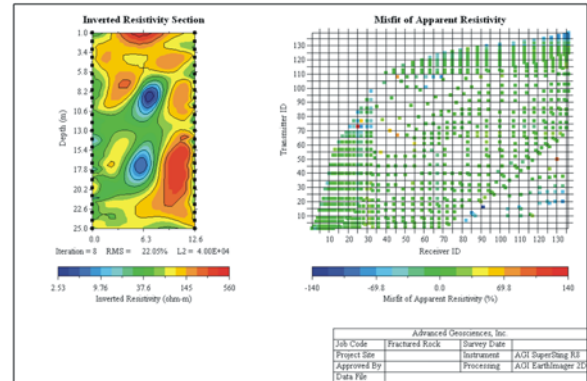
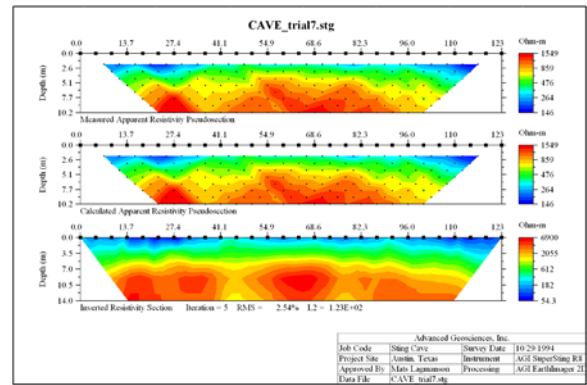
The optional Time Lapse function is used for any monitoring situation. It could, for example, be used to detect leakage at a landfill site. In such a case, the resistivity image is first recorded as "background" (before any leakage). After the initial "background" survey, the survey is repeated at regular intervals in the same way (electrodes in the same place using the same array type, etc.) so that any change in the ground can be detected. The time lapse function uses the inverted background section when inverting the "new" section and the result is presented as the difference between the two sections.

Survey Planner

The survey planner is used for feasibility studies of resistivity imaging projects. First load a command file, then enter the expected geological features with their expected resistivities in a graphical input interface. Then run the simulation using the actual command file and the software will perform a virtual survey over the synthetic model. The result of the virtual survey is then inverted and the inversion result can be compared to the original model within seconds.

Topography Correction

In case of terrain relief it may be necessary to include topography correction in the inversion process. Data with terrain elevation is read from a "terrain file" and the software will automatically perform an inversion using a finite element model.



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