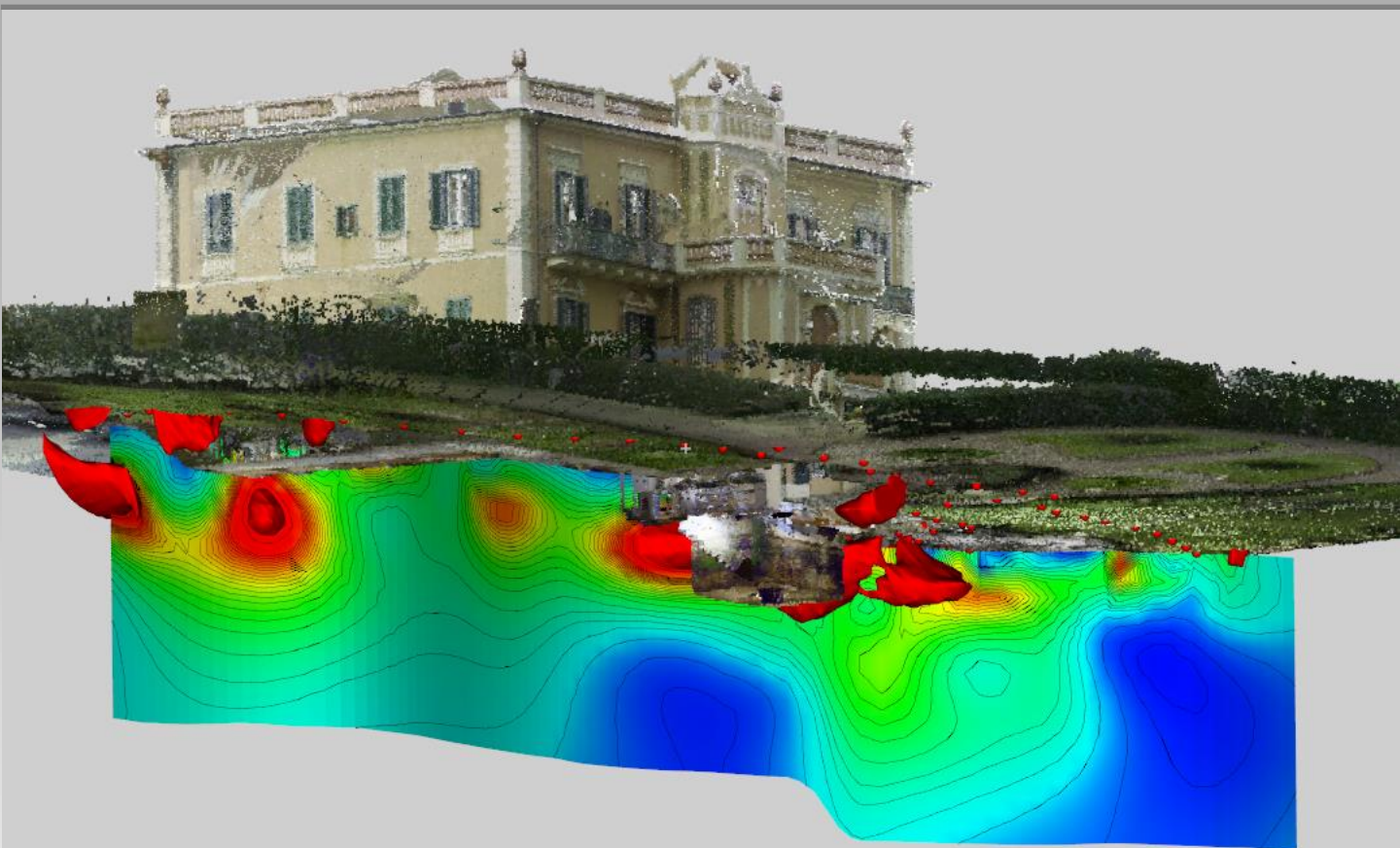


# ERTLAB STUDIO

*Complete software for full 3D ERT data management*



## MODELLING AND INVERSION SOFTWARE FOR 3D RESISTIVITY AND CHARGEABILITY ERT DATA

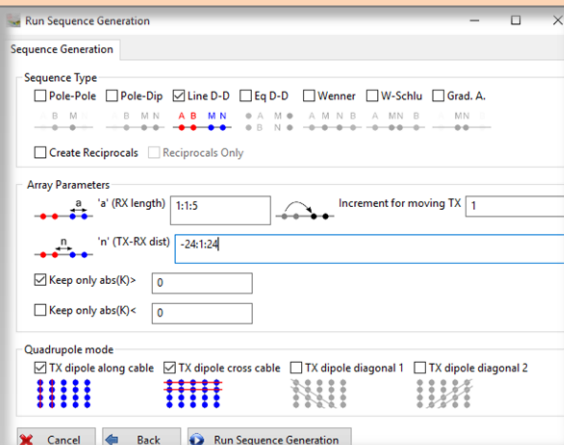


Geostudi Astier srl - Equipment and software for applied geophysics  
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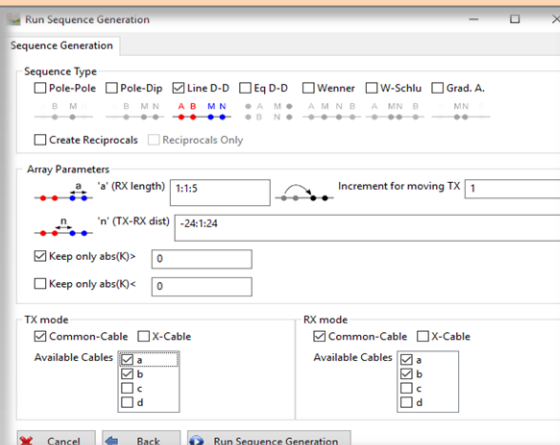


# ERTLAB STUDIO

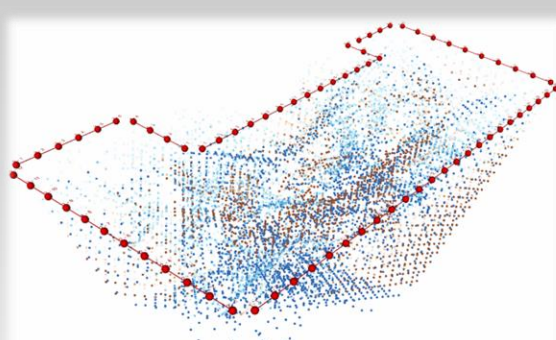
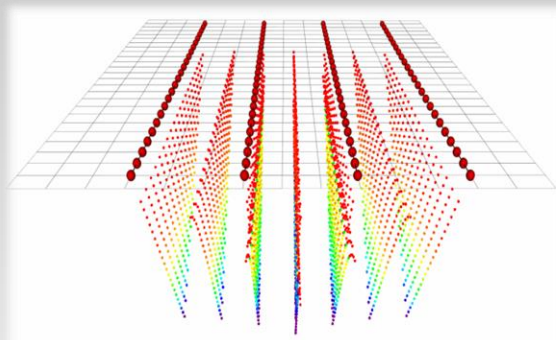
**Complete and dedicated tool for the creation of 2D and 3D arrays/schedules of surface and borehole electrical resistivity measurements**



«Grid» mode interface for sequence generation



«Cross cable» mode interface for sequence generation



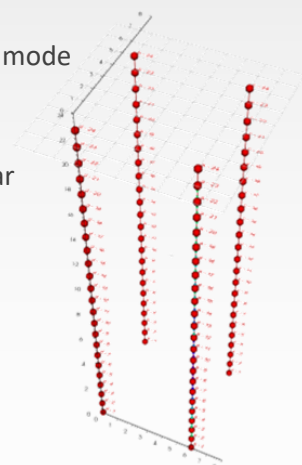
Disposizioni geometriche in superficie ed in foro con acquisizione 3D

## Cable/electrode definition

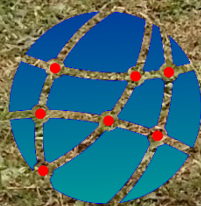
- User-friendly interface to insert electrodes and cables
- Practical 3D view managing of the inserted objects
- Mouse controlled selection of the electrodes to be skipped or to be used in *roll-along* mode

## Sequence generation

- Sequence generator for 2D and 3D surface, borehole or surface-to-hole surveys (Linear Dipole-Dipole, Parallel Dipole-Dipole, Pole-Dipole, Pole-Pole, Wenner, Wenner-Schlumberger)
- Special environment for Multi-Borehole sequence creation
- Option to create mixed arrays by appending multiple sequences
- Multi-channel receiver optimization
- Geometric factor constraining
- Reciprocal quadrupoles generation
- Different Import/Export formats (Electrell, ErtLab Solver, text)
- Conventional pseudo-plots for displaying measurement coverage







# ERTLAB STUDIO



## Software for 3D finite element inversion of electrical resistivity and chargeability measurements

### MAIN FEATURES

- Tetrahedral finite elements modelling
- Data quality control Q / A and data filtering based on threshold values or interactive histograms
- Free definition and modification of topographic coordinates of the measuring points
- Able to manage any surface and downhole measurements with any electrode geometry
- Free definition of the *mesh*
- Possibility of inclusion of any topographic model
- Possibility to define targets or resistivity models
- Manual or automatic definition of the starting model
- Export and data management via easy-to-handle ASCII file

### IN DETAILS

#### Data quality control

- Data visualization using pseudo-three-dimensional maps
- Graphical and numerical filtering of inaccurate measures
- Reciprocals check function

#### Inversion

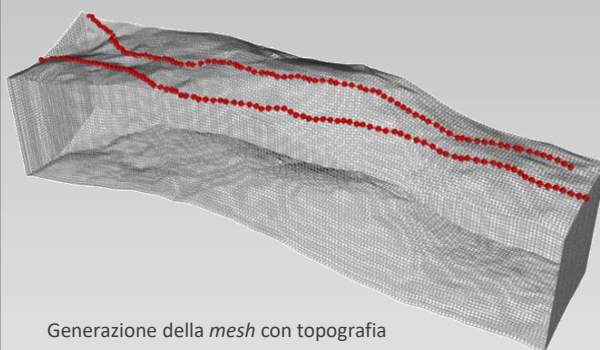
- Automatic quick inversion function for 2D profiles
- Least Squares Inversion algorithm with regularity constraints (*smoothness constrained*)
- Robust inversion (data variance iterative reweighting)
- Full control of all parameters involved into inversion
- Direct solver (accuracy *solver*, n. iterazioni, *preconditioning*)
- Boundary conditions (*Neumann*, *Dirichlet*, *mixed*)
- Regularization factors
- Roughness functions weights
- Noise estimation
- *Time-lapse* processing

#### Mesh generation

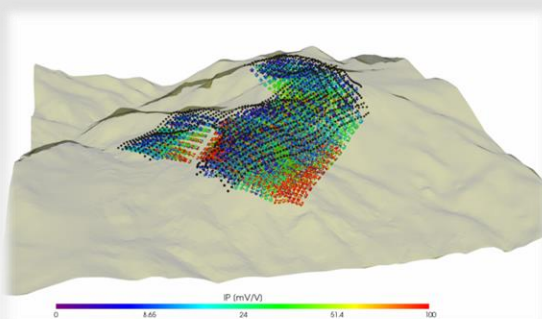
- Manual or automatic mesh generation for complex 3D topographic surfaces
- Special tools for customized user defined *mesh* generation with set up different size along the same direction;
- Mesh and model import/export tools

	Min	Elem Size	Max
X	0.0000	0.7500	20.4500
Y	-116.0000	0.7500	32.9700
Z	-25.1000	0.7500	0.2000
Z-Depth	Topo	0.7500	25.1000

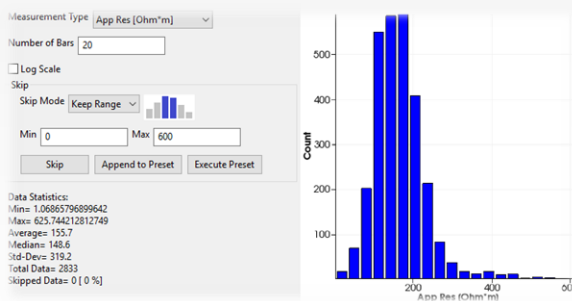
Impostazione della *mesh*



Generazione della *mesh* con topografia



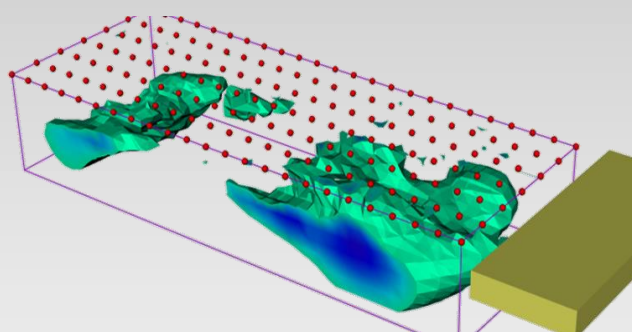
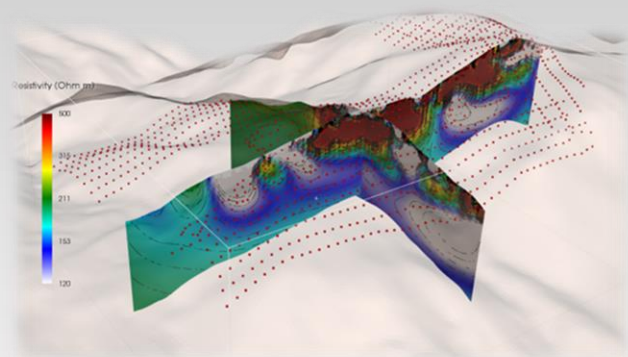
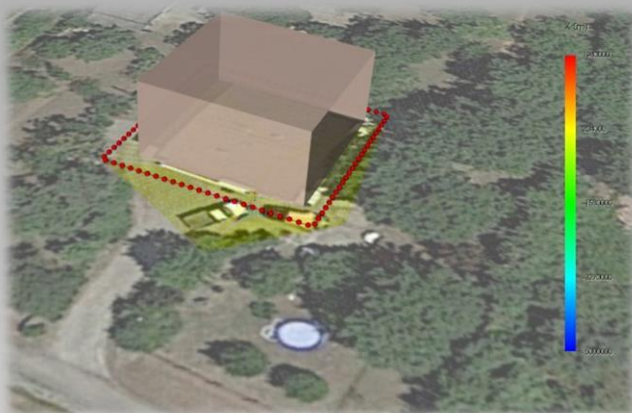
Visualizzazione dati di campagna su topografia DTM



Analisi statistica e filtraggio dati interattivo

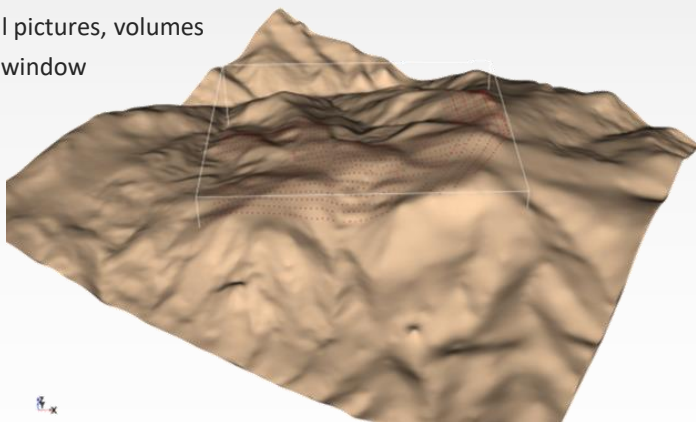


## New generation tool for 3D visualization of inverted resistivity/chargeability model



### MAIN FEATURES

- Import and creation of graphical objects, .dxf files, aerial pictures, volumes
- Possibility of import for different models in the same 3D window
- Automatic generation of 2D sections from 3D model
- Transparency function to graphical object
- Resistivity volumes generation
- Several colour scales available
- Isosurface user defined setup
- Plumes extraction (volumes)
- Orthographic/perspective view
- Axes properties definition, labels editing
- Display sections in xy, yz, xz or any generic direction





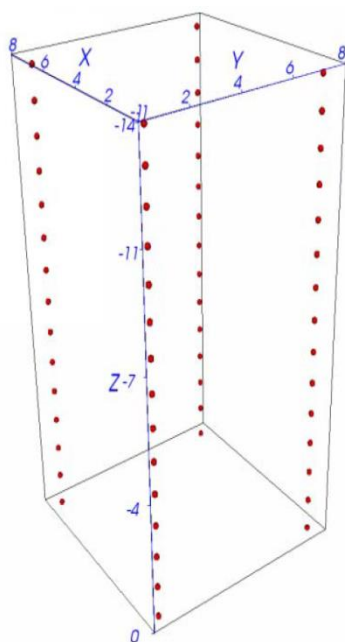


# ERTLAB STUDIO

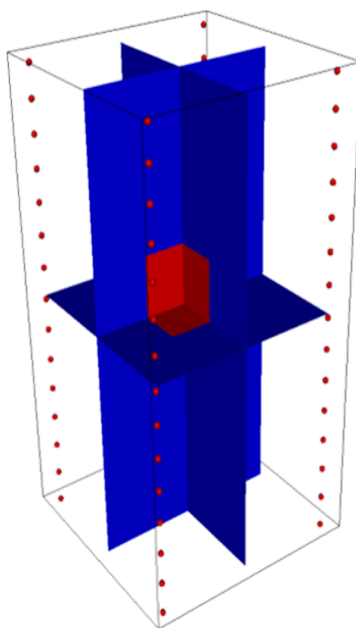


## *Forward model (Survey design)*

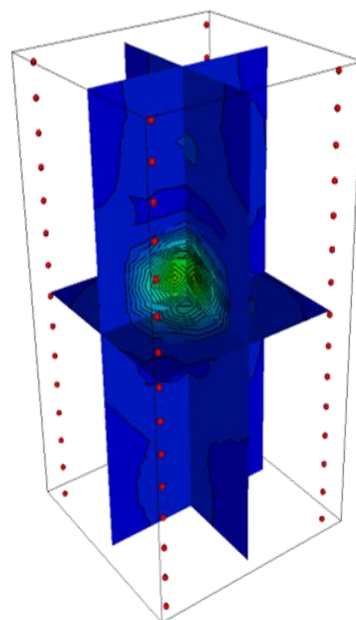
**Dedicated tool to 2D/3D ERT measurement synthetic simulations**



*Electrode Array*



*Synthetic model*



*Inverted model*

### Survey Design

This tool is able to perform:

- resistivity/IP 3D forward modelling from generic sequences
- analysis and display of sensitivity functions
- interactive definition of the starting model

**Forward modeling is a very powerful tool** to evaluate the capacity of the implemented model to detect predefined targets.

*The knowledge of these parameters are essential for a correct field survey design providing with important information about the right position of the electrodes and the correct choice of the electrode device to be used (Wenner, pole-dipole, etc.) in order to achieve the requested purpose*