



## EMIGMA V9.x Professional Series

### EMIGMA NEAR-SURFACE COMPLETE – *Magnetics, FEM, TEM, Resistivity, Gravity, CSAMT*

*February 2014*

**Up to 50,000 points per survey**  
**Each database may contain 10's of surveys**

**GUI Interface** - Intuitive User Interfaces for Windows 2000/XP/Vista/7/8/10

#### **Data Imports**

- **Large Loop TDEM Imports** (GEONICS, Zonge, UTEM and CRONE)
- **Small Loop TDEM Imports** ( **FastTEM, TerraTEM, WTEM, Phoenix**)
- **Moving Loop TDEM Imports**
- **Step-Wise Moving Loops TDEM Imports**
- **Fixed-Loop ground surveys**
- **Sounding TDEM data imports**
- **FDEM Imports** (Ground )
- **AMIRA TEM** (Geonics, Crone, Sirotem, SmarTEM)
- **Time Domain IP** (ELREC 6, Scintrex, Zonge .avg, Phoenix or as an ASCII text )
- **Frequency Domain IP** (**Generic** ASCII text format and Zonge .avg)
- **Resistivity Data** (Generic ASCII and Zonge .avg text file)
- **Gravity Data** in XYZ or QCTool format
- **Magnetic Data**, TMI, Gradient Data, Vector data in XYZ or QCTool format
- **CSAMT Data** – native Zonge and Phoenix and .qct import derived from ASCII

#### **Data Management**

- Database backbone
- Large data set handling: three levels of data organization inside a database
- Merging, export, import of data sets and their customization for further use in EMIGMA modeling
- Data statistics

#### **Data Processing and Correction**

- 1D and 2D digital and spatial filters, with sizes specifiable by the user
- Simple and weighted averaging decimation
- FFT tools (derivative calculation, upward/downward continuation, filtering, RTP) for magnetic/gravity data applicable to both measured and synthetic data
- Graphical data extraction, profile editing and modification
- Data Spreadsheet tool combining dynamic spreadsheets and line plotter for data cleaning, missing data interpolation and simultaneous plotting of different data channels for fast cross-analysis
- Magnetic base station correction

### **3D Modeling**

- Easy model building: large data sets, flexible profile generation and manipulation, multiple system geometries, large loop modeling, etc.
- Unlimited plate, prism and polyhedra anomalies suitable of EM, Magnetic, IP/Resistivity, Gravity data
- Multiple target shapes: pipes (hollow cylinders with or without lids), ellipsoids, shells, bullets, landmines, drums, spheres, prisms, plates, general polyhedra...
- Multiple scattering modeling: Simple Superposition, Far- and Near-Field Interaction, Automated Mode (the type of interaction is selected for you)
- Synthetic Topography-Poly Generator for modeling complex geological anomalies and topography
- Modeling conductors with volume ILN prisms - Volumetric Induction Modeling
- Model suite generation for rapid building of layered earth and plate model suites with varying resistivity, thickness, strike, strike length, dip, dip extent, plunge and conductance
- 3D forward simulation in batch mode: multiple sources, any number of profiles, any number of data components
- Import and export of geological models for CAD applications
- Model building tool in 3D space

### **Data Inversion**

- 1D inversion for EM and Resistivity data
- 3D inversion for Magnetics and Gravity including topographic effects
- 3D Inversion of Resistivity Data
- 1D and 3D Inversion of CSAMT data utilizing 3D source
- Section cutting of 3D models in the 3D Visualizer
- 2D representation of geoelectric sections – PEXShow tool

### **3D Euler Deconvolution**

- Statistical and Rodin post-processing
- 2D and 3D visualization of solutions

### **2D and 3D Visualization**

- Data visualization in 3D space, as profiles, vectors, true 3D surfaces or contoured surface along with the 3D structure display
- Ability to view up to three data channels
- 3D modeling tools: easy object manipulation and adjustment, single-click conversion of prisms to polyhedra, etc.
- 2D and 3D visualization of Euler solutions and magnetic inversion results

## Plotting

- Comprehensive XY Plotter for plotting data, decays, spectral response and positions
- Multi-channel and multi-profile plotting
- Flipping between resistivity and conductivity
- Switching between channels, profiles and models
- Plotting to scale
- Multiple plots per page
- Residual plotting
- Saving plotting defaults for rapid plotting of model suites

## Gridding

- Five gridding algorithms: Natural Neighbor, Delauney Triangulation, Shepard & True-to-Data, Minimum Curvature and Thin-Plate-Splines
- Quick setting of your grid geometry and input data to be used for interpolation – ProfileViewer
- Residual grids

## Grid Presentation and Analysis

- Multi-component grids - switching between channels and components without a necessity to grid anew each time
- Rectangular grid cells
- Profile, data and contour overlays
- Equal Weight and Equal Range display
- Single-click conversion to Apparent Resistivity and Conductivity
- Analytic Signal displays
- Euler solution overlays
- Superposition on raster maps and annotation
- MultiGrid tool - viewing and comparing up to 4 grids at a time

## Contouring

- Multi-component contours – switching between components and channels
- Flipping between Apparent Resistivity and Conductivity
- Contour lines and their customization
- Data display as 3D surfaces
- Range of pseudo-depth and pseudo-section displays
- 3D volume interpolation of inversion results – section cutting

## Mapping

- Maps may be imported and exported through Geotiff formats
- Map editing tool is provided with our PEGEOMAP tool
- 2D AutoCAD import/export