EIKON TECHNOLOGIES

EMIGMA V11.x for Ground Series

EMIGMA GROUND COMPLETE – ***October 2025***
Magnetics, FDEM, TDEM, Resistivity, Gravity, CSEM/CSAMT

True Database Structure
– each database may contain many surveys with different styles and types of data

GUI Interface - Intuitive User Interfaces for Windows 7/8/10/11

Data Imports includes

- **Large Loop TDEM Imports** (*e.g.* SMARTem, GEONICS, Zonge, TerraTEM, UTEM and CRONE)
- **Small Loop TDEM Imports** *(e.g.* TerraTEM, FastTEM, GEONICS, WTEM, Phoenix, Loupe*)*
- **Moving Loop airborne and ground**
- **Step-Wise Moving Loops TDEM Imports**
- **Fixed-Loop ground surveys**
- **Boehole surveys**
- **Sounding TDEM data imports**
- **FDEM Imports** (Ground)
- **AMIRA TEM** (SMARTem, Loupe, Geonics, Crone, Sirotem, TerraTEM)
- **Time Domain IP** (GDD, IRIS, Scintrex, Zonge .avg, Phoenix, ASCII XYZ)
- **Frequency Domain IP (**Generic ASCII format and Zonge .avg**)**
- **Resistivity Data** (Generic ASCII, IRIS, Zonge and Phoenix .avg text file)
- **Gravity Data** (Scintrex, Micro-G)
- **Magnetic Data**, (GEM, Geometrics, Scintrex and Generic TMI, Gradient Data, Vector data)

Data Management

- Database backbone
- Large data set handling: three levels of data organization inside a database
- Grids, Models, Notes, Inversions, etc all attached within db to each survey
- Merging and their customization for use in EMIGMA modeling/inversion
- Model/Inversion/Grid exports
- 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/DFT 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
- Magnetic base station corrections
- Tie Line leveling
- Full Suite of Gravity corrections

3D Modeling

- Easy model building: large data sets, flexible profile generation and manipulation, multiple system geometries, large loop modeling, etc.
- Two thin-sheet plate algorithms, multiple rectangualr prism and polyhedra anomalies suitable of EM, Magnetic, IP/Resistivity, Gravity data
- *NEW* high accuracy SPHERE algorithms including all effects of susceptibility, suitable for very high contrasts and frequencies. TDEM, FDEM, IP/Resistivity
- 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
- Incorporation of DEM data
- 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 a true 3D scene

Data Inversion

- 1D inversion for TDEM, FDEM, Resistivity, CSEM/CSAMT data
- 3D inversion for Resistivity and CSEM/CSAMT
- 3D inversion for Magnetics and Gravity including inversion within topography
- 3D Inversion of Resistivity Data
- Section/Plan cutting of 3D models
- 2D representation of geoelectric sections

3D Extended 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

- XY Plotter with extensive functionality for plotting data, decays, spectral response, separations and profiles
- Multi-channel and multi-profile plotting
- Button switching between channels, profiles, decays, separations and models
- Saving of Plot settings

Gridding

- Rectalinear Grid cells to maintain inline resolution and reduce crossline artifacts
- Multi-parameter grids: One grid to hold entire all channels of a survey
- Rapid switching between data channels with the grid
- Multiple grid storage linked in database to survey data
- Computed derivatives stored with data in a single grid
- Five gridding algorithms: Natural Neighbor, Delauney Triangulation, Shepard & True-to-Data, Minimum Curvature and Thin-Plate-Splines
- Grid at arbritary azimuths
- Quick setting of grid geometry with graphical view
- Grid survey data, model data and residual data

Grid Presentation and Analysis

- With Multi-component grids allows to switch between channels and components without a necessity load a different grid
- Grid data, Profile data, and contour data can be viewed simutaneously
- Equal Weight and Equal Range display
- Select grid point or profile point to display information
- Euler solution overlays
- Superposition on raster maps and annotation
- Export grids and maps
- Data decay grids
- MultiGrid tool - viewing and comparing up to 4 grids at a time

Contouring

- High accuracy with detailed resolution 2D data interpolation and contouring
- Apparent resistivity/conductivity, analytic signal, derivatives, decay and other processng algorithms within display applications
- Data display as 3D surfaces
- 3D volume interpolation of inversion results with plane/section cutting

Mapping

- Maps may be imported and exported through Geotiff formats
- Map editing is provided with provded PEGEOMAP app
- GNSS registration of external maps with PEGEOMAP
- 2D AutoCAD import/export
- 2D/3D Adobe .pdf exports