

## The software - *GeoModeller*

*GeoModeller* is a software tool for building implicit 3D geological models from a diverse range of data sources and facilitating forward and inverse modelling of potential fields geophysics, including full tensor gradiometry.

The software deals well with complexity including fault networks, folding, overturned strata, intrusions and thin bodies. Steady state implicit surfaces are constrained by primary geological data (contacts and orientation data) together with drill hole intercepts. 3D geological surfaces are interpolated by a 'potential field method' which derives joint-constraints from contacts and orientation data (and therefore computes structural contours through the volume of a geology unit, akin to bedding). Fault surfaces are interpolated in a similar manner.

*GeoModeller* employs **rule-based modelling**, adhering to the relationships within a stratigraphic pile (erode or intrude) and when setting-up fault networks (emulating fault chronologies).

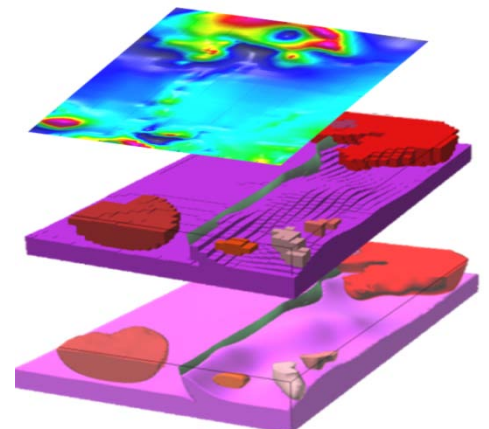
*GeoModeller's* **drill hole manager** includes compare and edit tools for trouble-shooting misfits in logging. Down hole attributed data (eg., density logs) can be managed through geostatistical functions, and 3D interpolation/kriging routines. Handling and creation of 2D & 3D grids and meshes is also facilitated with a 3D Mesh Calculator.

### Special features:

- Handles thin bodies by strategies including building 'dyke-like' objects or anisotropic rendering
- Offers a clever kriging method (domain kriging) adopting to interpolate along structural contours through the volume of a geology unit, akin to bedding
- 2.5D forward modelling direct from 3D geology for: magnetics, gravity, synthetic seismographs
- 3D forward modelling direct from 3D geology (using associated rock properties) for: magnetics, gravity, full tensor gradiometry and conductive heat flow
- Performs rock property optimization during the forward modelling stage
- 3D stochastic litho-constrained inversion of magnetics or gravity (or both jointly) in any ratio from full property to full geology inversions. Employs probability distribution functions during multiple model simulations
- 1D and 2D inversion of EM data available very soon (on new Release, late 2014)

### Business Benefits of *GeoModeller* software:

- *Save time performing resource assessment and geological validation*
- *Reduce the risk of exploration by deriving probability metrics for uncertainty of geology at depth, independently verified by geophysics*
- *Maximize data set use – all in one workspace*
- *Rapidly locate drilling targets in 3D based on synthesis of geophysical and geological evidence*



*Specialising in Geophysical Processing and Interpretation Systems*

## The software - *Intrepid*

*Intrepid* is a software suite with extensive capabilities in airborne, ground and marine magnetics, terrestrial and marine gravity, and multi-channel radiometrics data processing.

The stand-alone modules of *Intrepid* deliver comprehensive tools for processing, filtering, interpretation and visualisation of potential field geophysics survey data. Newly developed tools provide capacity to process and interpret airborne magnetic and gravity gradiometry data; both Full Tensor Gradiometry (FTG) and Falcon.

### Capabilities:

Import, access and export data (Utilities eg., Projection conversion, Survey distance calculator)

Edit, transform and manage data (Spreadsheet editor, Profile editor, Flight path editor)

Line filtering

Data extraction (sub-sectioning)

Display data and compose maps (including *3D Explore*)

Correct magnetic, gravity and radiometric data with special-purpose tools

Grid data and manage grids,

Variable density gridding, grid gradients, grid merge

Leveling airborne (Tie-line, micro-leveling, decorrugation)

Marine processing (Leveling, QC)

Grid filtering (FFT, Grid convolution)

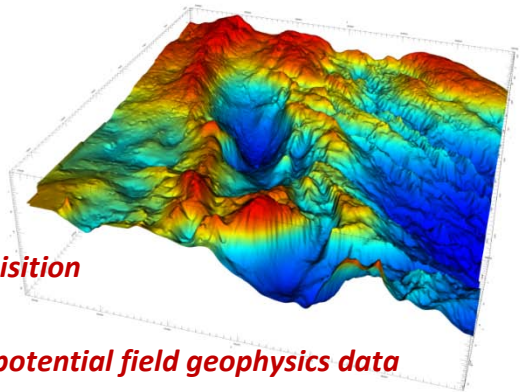
Tensor data processing - Full Tensor Gradiometry (FTG) and Falcon

Interpretation tools – including Depth to basement methods: Naudy, Murthy and Rao, Phillips, Euler, WormE and matched filter

Multi-Scale Edge Detection (worming for structural analysis)

### Special features:

- All Intrepid tools handle **Full Tensors** (Editor, Line/Grid Filter, Levelling, Gridding, Euler etc)
- **Grid-Merge**, best algorithms employed (Geoscience Australia has given a testimonial to this)
- **Automatic modelling** outputs go straight into *GeoModeller* for building *geology from geophysics*
- **WormE** ('Multi-scale edge detection' now with depth conversion for UC levels) delivers results from superior algorithms (soon to include auto-calculation of dips data straight from 3D worms)
- Handles **multiple input** datasets
- File manager **Stat Tool** is very handy for QC
- Comprehensive **Land gravity networks** tool
- **Variable density gridding** (unique to *intrepid*)



### Business Benefits of *Intrepid* software:

- **Increase the value of your returns from data acquisition**
- **Generate targets and prospects**
- **Gain highest possible resolution of geology from potential field geophysics data (Innovative interpretation tools, Full tensor support)**
- **Characterize mineral prospects, Oil & Gas plays, Geothermal settings**

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