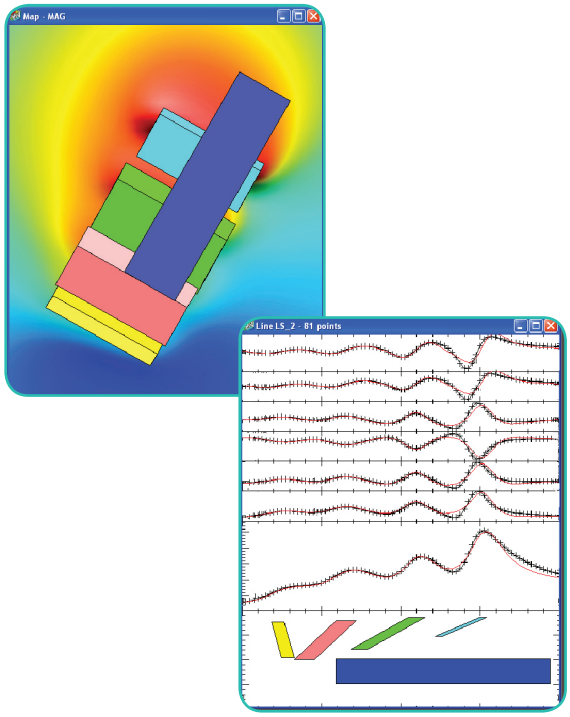
encom advances

encom modelvision version 9.0
release notes

Encom is proud to release ModelVision Pro 9.0, which continues the tradition in software releases of presenting innovative modelling techniques for magnetics and gravity data. This exciting release of the industry standard in potential field modelling software allows the extraction and utilisation of more information from new generation instrumentation and efficient semi-automation of target and regional area modelling.



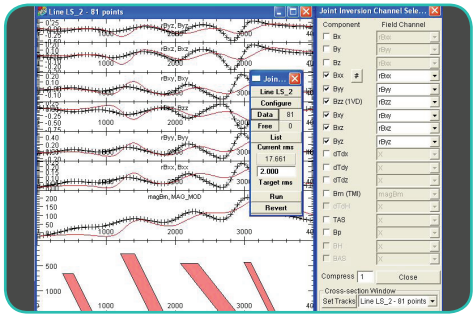
New Features

At a glance

- **Joint Inversion**
  ModelVision is now capable of inverting on multiple sensor channels from modern instruments including cross-wing gradiometers full tensor gravity and magnetic gradiometers, and multi-component fluxgate arrays. Joint inversion supports the elliptical pipe, tabular body and circular pipe.
- **New Circular Pipe Body**
  A new body type has been introduced which contains two less parameters than the elliptical pipe.
- **Data Wizard**
  Drawing a polygon or rectangle in map view with the Data Wizard extracts the contained line and grid data, sets the regional and opens active cross-sections. This speeds up advanced 3D modelling and inversion of anomalies of interest.
- **Body Sub-Division**
  It is now possible to sub-divide a single body into multiple bodies with their own independent parameters.
- **Regional Body Status**
  Bodies can be classed as regional contributors or target contributors which allows for direct inversion of either body class. This feature is essential for joint inversion.
- **Advances in AutoMag**
  Automatic strike correction, tuning and dynamic solution filtering have greatly improved AutoMag's utility.

Joint Inversion

A new joint inversion tool has been added to ModelVision to allow you to extract more detailed geological information from multi-sensor instruments such as airborne gravity gradiometers, cross-wing total field gradiometers, SQUID full tensor magnetometers, 3 component fluxgate magnetometers and ground mounted vertical and horizontal gradiometers.



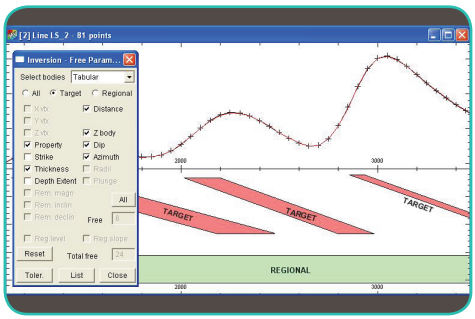
Example of full tensor magnetic inversion data set.

For example, inversion of the cross-wing total field magnetic gradiometer (dT/dx, dT/dy) allows us to recover the azimuth of linear magnetic anomalies from a single line data segment. Once the azimuth is known we can recover true depth, susceptibility and dip without detection of the feature on adjacent lines. Joint inversion also allows you to recover the location of a pipe that is offset from the flight line. With quality data you can recover X, Y, Depth and Radius (if depth < 2r). This new ability has significant implications for reinterpreting old gradient surveys, recovering more effective geological information from reconnaissance scale surveys, and widely spaced marine surveys for detection of seamounts, dykes and volcanics. In this release of ModelVision Pro, joint inversion of magnetic or gravity data can be applied to the elliptical pipe, circular pipe and tabular body types.

Regional Bodies

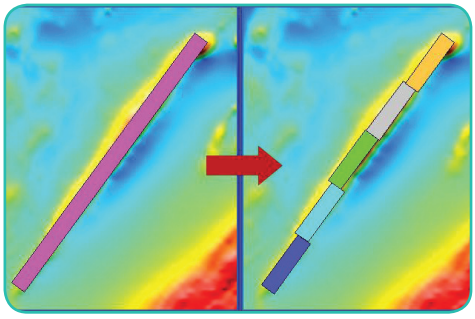
The introduction of joint inversion required a new method for management of regional fields where body contributions are associated with a regional field or target field. This allows a geological representation of the regional response and easier management of regional and target bodies. The polynomial regional representation is still available for standard single channel inversions.

Bodies can be nominated as regional from the Body Properties Table or from the Body Properties Dialog Box. You can then selectively invert on Regional, Target or All bodies in the Free Parameters dialog of the Inversion toolbar.
A regional response from all active regional bodies can be viewed as a separate curve to the total response, i.e. response from all active regional plus target bodies.



Body Sub-division

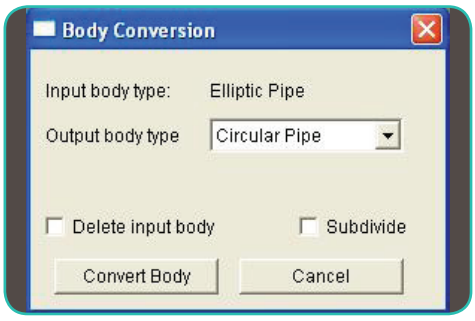
It is now possible to sub-divide a single body into multiple bodies with their own independent parameters. The original body can be subdivided based on the dip plane, strike plane or horizontal plane of the body.



Example subdivision of a tabular body into 5 tabular bodies.

Body Conversion

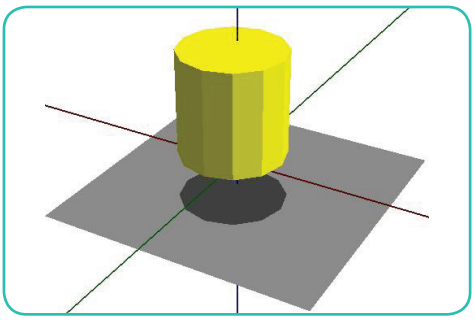
The ability to convert a tabular body to an elliptical pipe and circular pipe has now been introduced. It is also now possible to convert an elliptical pipe body to a circular pipe body (removal of one radius parameter), which may be more appropriate for inversion when data is limited by single line segments.



Circular Pipe Body

A new body type has been introduced which contains two less parameters than the elliptical pipe. Parameters which can be manipulated are: Vertical Extent, Plunge Azimuth, Plunge, Radius and Taper.

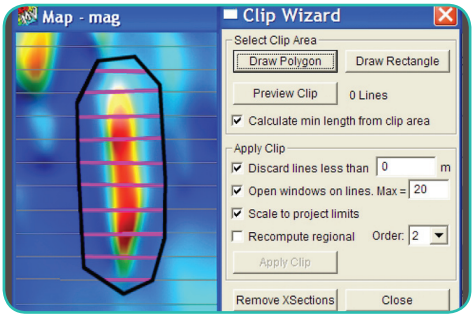
The elliptical pipe is not easily constrained using a single line data segment, but the circular pipe can be inverted for radius with appropriate constraints on position.



Easy 3D Inversion Setup

A Data Wizard toolbar button has been added to make it easier to select an anomalous region for modelling through automatic subsetting of the project and opening of all the cross-section views. The user can draw a polygon or rectangle in map view and the wizard will extract line and grid data from within the polygonal region.

The wizard can automatically open the lines, set the active points and calculate an estimated regional. This wizard can save you 15 – 30 minutes in preparing a complex anomaly for full 3D inversion.



Polygonal boundary created with the new clip wizard.

New filters in GridFilter

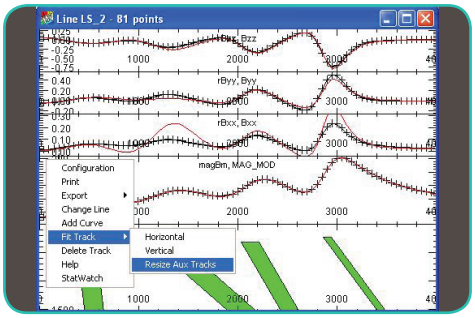
Five additional FFT filters have been released in ModelVision Pro 9.0

- FFT Analytic Signal
- FFT Integration Filter (Advanced)
- FFT General Directional Transform Filter
- FFT Directional Pie Slice Filter
- FFT TMI General Phase Transformation Filter

Autofit of Cross-section Auxiliary Tracks

When there are several auxiliary tracks on a section, resizing the model section and primary track can leave spaces or compress other auxiliary tracks vertically. Rather than resize the auxiliary tracks individually, there is now an option in the pop-up menu of the auxiliary tracks to evenly vertically scale and refit the data with a single click.

All auxiliary tracks above the track that is clicked on to view the pop-up menu are included in the re-scaling event.



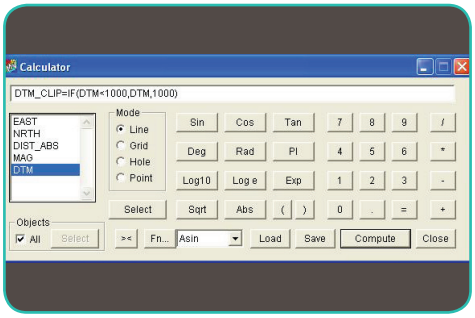
Use the right mouse click in an auxiliary track to access the autofit function.

”IF” Statement in Calculator

The Calculator function in ModelVision Pro now has an “IF” statement available. IF(Boolean, result_if_true, result_if_false) Example, for computing the equation:

DTM_CLIP = IF(DTM<1000, DTM, 1000)

The Calculator utility will look like:



TKM model file Information

The model format used by ModelVision Pro, .TKM now contains projection information for the current project.

Group Editing

This has been extended to edit properties of all bodies of the same type together.

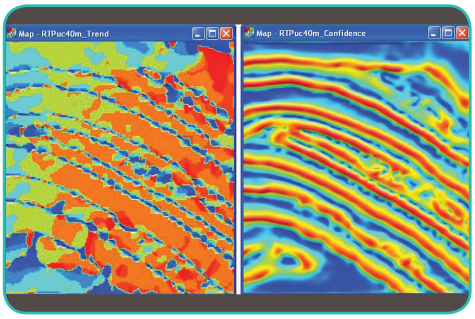
AutoMag Advances

New productivity tools in AutoMag make it much faster to tune, QC, strike correct and filter solutions.

Trend Gridding (AutoMag)

AutoMag uses the azimuth and confidence grids from the new trend gridding application for strike correction and filtering.

- The confidence grid can be used as a new trend interpretation tool as well as dynamic filtering of AutoMag solutions.
- The trend azimuth grid is used for the estimation of the strike direction of solutions (0-180 degrees).

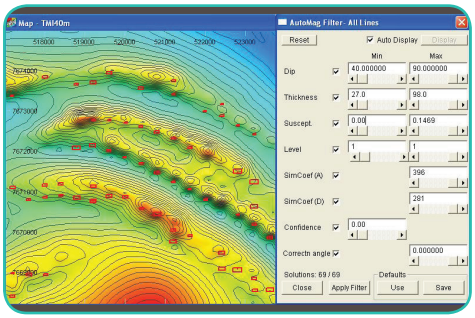


Example of azimuth and trend confidence grids

Interactive Solution Filter

The Filter dialog has been upgraded for real time, visual filtering of solutions using sliders that cover the range for each parameter. The user can then quickly determine the optimum parameters for the solutions without performing an AutoMag re-run.

The ability to save and restore filter parameters is another option implemented to improve the efficiency of the utility.



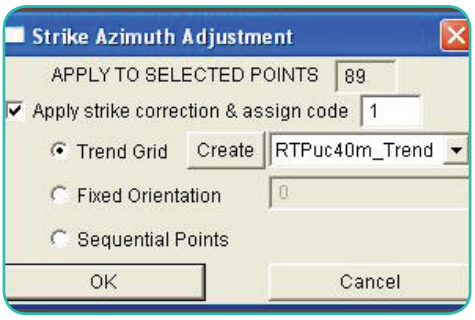
Example of the real time filter dialog sliders used to eliminate unwanted solutions.

In addition to the standard parameters the new AutoMag version has new filter parameters:

- Stage 1 and Stage 2 similarity coefficients which reduces the need for precise thresholds
- Trend confidence which is determined from the trend confidence grid
- Anomaly strike direction relative to the flight line.

Automated Strike Correction

AutoMag now has the ability to automate the strike correction for depth, susceptibility, width and dip from trend grids produced by the new trend gridding utility.



Quick Invert Seeds AutoMag Tuning Parameters

The Quick Invert utility can be used as a preliminary step for AutoMag by computing a seed model from a single line of data and then selecting the AutoMag button to apply these tuning parameters to the AutoMag process.

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Bug Fixes & Feature Improvements

- **Crash caused by Triangulation** - Triangulation of a polygon or prism body which is done for computation and for volume calculations sometimes caused a crash.
- **Spatial fields for a locked body** - One of the spatial edit fields remained enabled when the body was locked.
- **XVT Error upon loading session -** XVT invalid rectangle error message occurred upon loading a session. The symptom was the xvt error then the task window failed to appear and the program hung (but did not crash).
- **Crash while deleting lines** - Line deletion in multi-section wizard sometimes caused a crash.
- **Inability to load pipe bodies** – Elliptical Pipe bodies could not be loaded into a session from old .TKM files.
- **Channel field length too short** - Some channel fields were too short to see last part of the field name. These have been increased to various field sizes.
- **XVT Print Error upon startup** - The underlying program code does not support some modern print drivers and an annoying error message would appear on startup. When the user wishes to print they are now given the option to change printer to a PDF document writer for later printing.
- **Hidden ERV Vector Images in map** - ERV vector images were hidden by a grid image. ERV Vectors have now been moved up in the default drawing order.
- **Cancelling Inversion from progress bar** - Standard inversion often did not cancel on the progress bar. A “beep” has been added to the cancel button to indicate it has been recognised. An ESC key interrupt has also been added as an alternative.
- **AutoMag Annotation Modulation** – The user could not modulate the AutoMag annotations in a map view. This has now been implemented for each channel which applies to all AutoMag points.
- **Bunching of labels** – a fix has been implemented for when performing vertical panning the labels would bunch against left margin.
- **Inability to clip point sets** - Clip Wizard would not clip point sets.
- **Remanence reported incorrectly** - The remanent intensity would sometimes be reported as zero in the .TKM file.
- **Incorrect drawing of contour lines** - Contours took up the line style of the last body drawn in map.
- **Adding/Deleting tracks from multi-track** - Adding and deleting tracks from multi-track view would cause the remaining tracks to resume default ratios.
- **Bad regional computation using null locations** - Sessions with lines containing a null location caused the regional to be computed incorrectly which also had display implications.
- **XVT error message with many grids** – too many grid images loaded into a map view caused a perpetual XVT Error message.
- **AUTOSAVE session file** – An AutoSave system has been implemented at user selected time intervals to save a temporary session file and automatically load it if starting after a crash.
- **Remanence warning added** - Added a warning “Remanence OFF” to the Resultant page to identify to the user if the remanence is turned off.
- **Trig functions added to Calculator** - Added asin, acos, atan, sinh, cosh, tanh to Calculator utility via a new drop down list button.
- **Deg and Rad buttons for Calculator** - Buttons changed to “Deg” and “Rad” to enable conversions to degrees and radians.

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