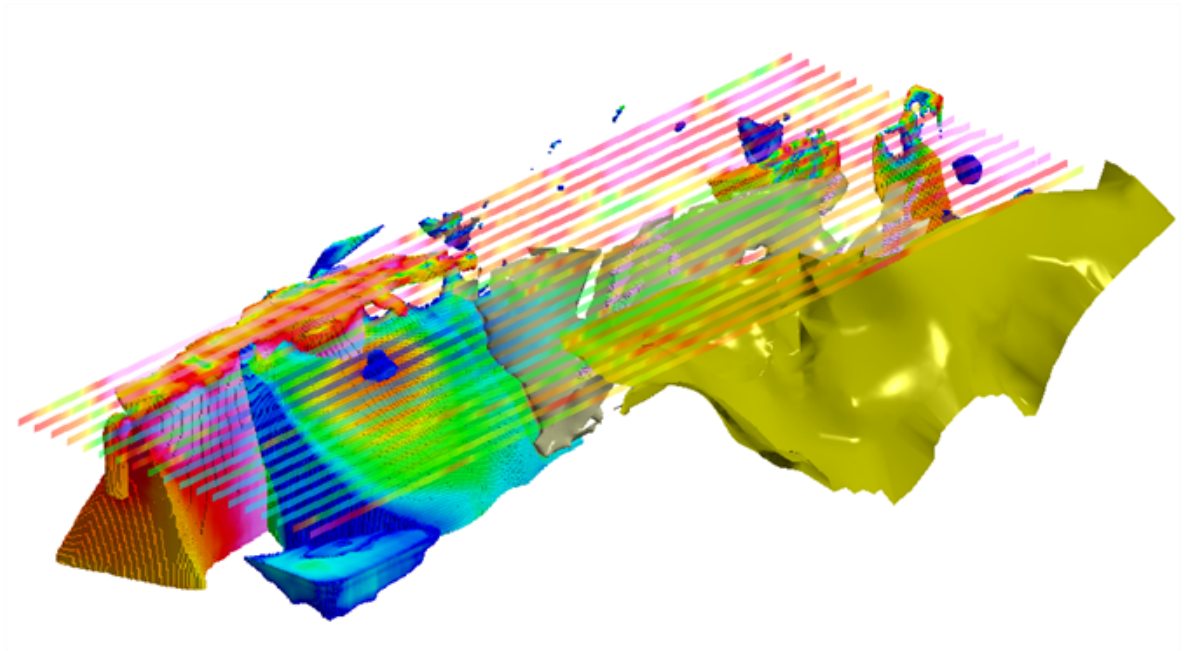


# VPmg 9.1 - Release notes



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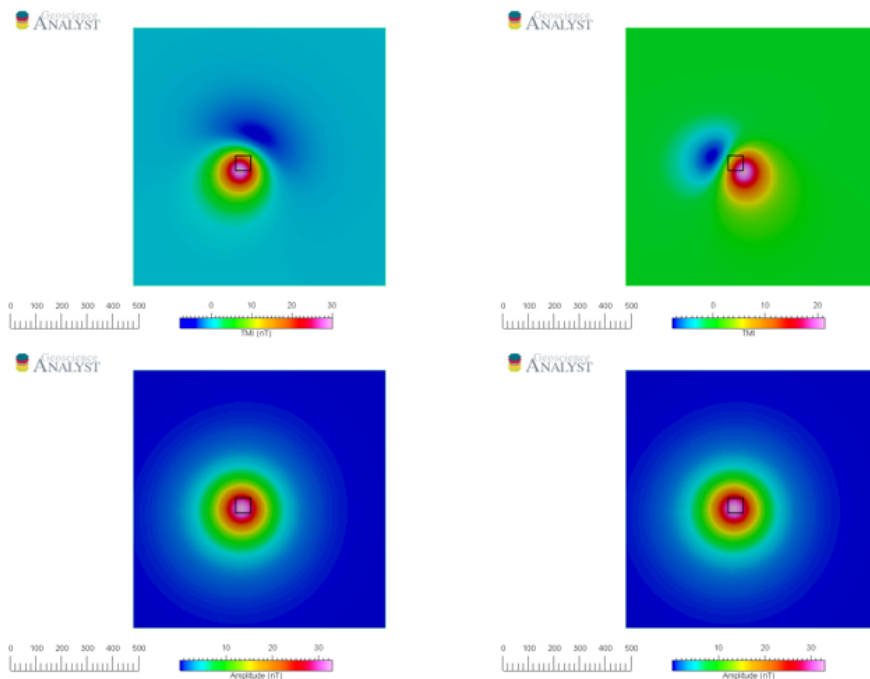
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## Overview

The release of VPmg 9.1 focuses on stability and usability. Several fixed issues and adjustments were made to help you better understand the inversion process. We have added further functionality to help with magnetic remanence. Additionally, we have added to the installer a new component of the VP Suite: VPutility 1.0, Which will help you to create, modify, and view VP models, and is compatible with all VP Suite products.

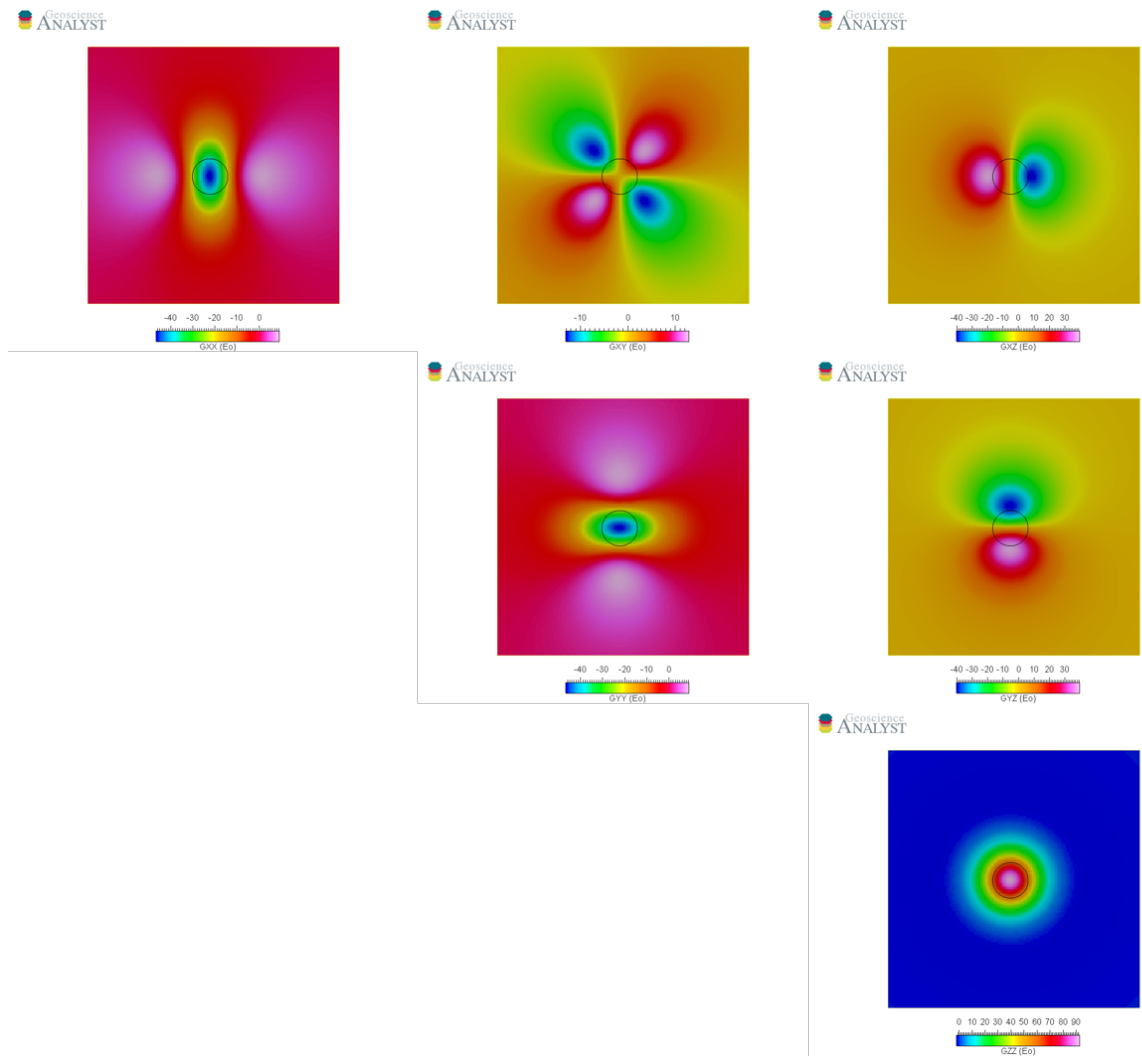
## New and updated functionality

- **Updated RMS misfit precision.** The default of two decimal places will change if the uncertainty is set less than 0.01.
- **User-specified memory** has been added to geometry inversion.
- **Addition of magnetic amplitude data** helps you to invert when remanent magnetization is present. Magnetic amplitude data is weakly dependent upon remanent magnetization and recovers an effective susceptibility.

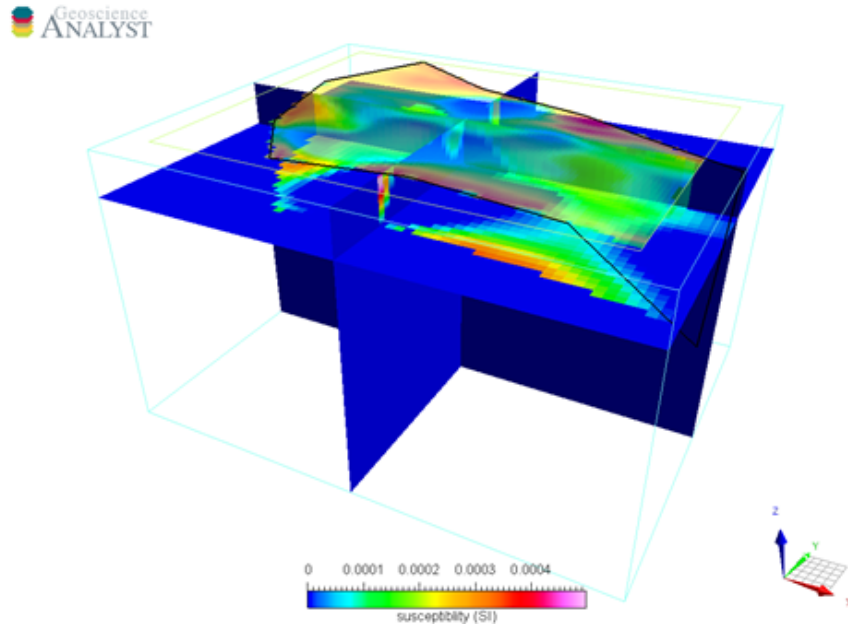


Responses of a block (black outline). Top left: Induced response ( $I=65^\circ$ ,  $D=25^\circ$ ). Top right: Response with remanence ( $I_r=25^\circ$ ,  $D_r=-65^\circ$ ). Bottom left: Computed amplitude response of the induced block. Bottom right: Computed amplitude response of the remanent block.

- **Heterogeneous cells are active for RMI inversion.** This has been re-inserted into version 9.1.
- **Gravity gradiometry data (FTG) has been rotated to reflect acquisition system.** Now the data can be input directly into VPmg for apparent density processing or inversion. The coordinate system has been rotated and displays below for a positive density block.



- **Area of interest can be defined in the VP model file.** VPmg 9.1 now allows you to spatially micro-manage your inversion result by defining a polygonal region of interest. The data outside of the area is ignored and the model outside of the area is set to be inactive. In some cases, you may want to add inactive areas within the polygonal region, which is done through the same input file.



An example of an inversion on just the region of interest defined by the polygon (black line). The semi-transparent predicted data is also shown.

- **Documentation and examples.** The documentation has been updated to provide examples that begin with data and topography. The ability to create models through VPutility is used allowing you to go step-by-step through the examples. The example files come with the installation.

## VPutility

VPutility 1.0 is a free addition to the VP Suite helping you to create and modify VP models. It is a command line tool that comes with seven features and is compatible with all VP Suite products.

### VPutility features

**Create layered-earth VP models.** A VP model file can be created with ASCII-based files that represent surfaces and do not necessarily need to be gridded.

**Export VP models to Geoscience ANALYST.** With a single call to VPutility (and no control file), any VP model and its data can be written to a Geoscience ANALYST project file (.geoh5) for viewing in 3D and sharing.

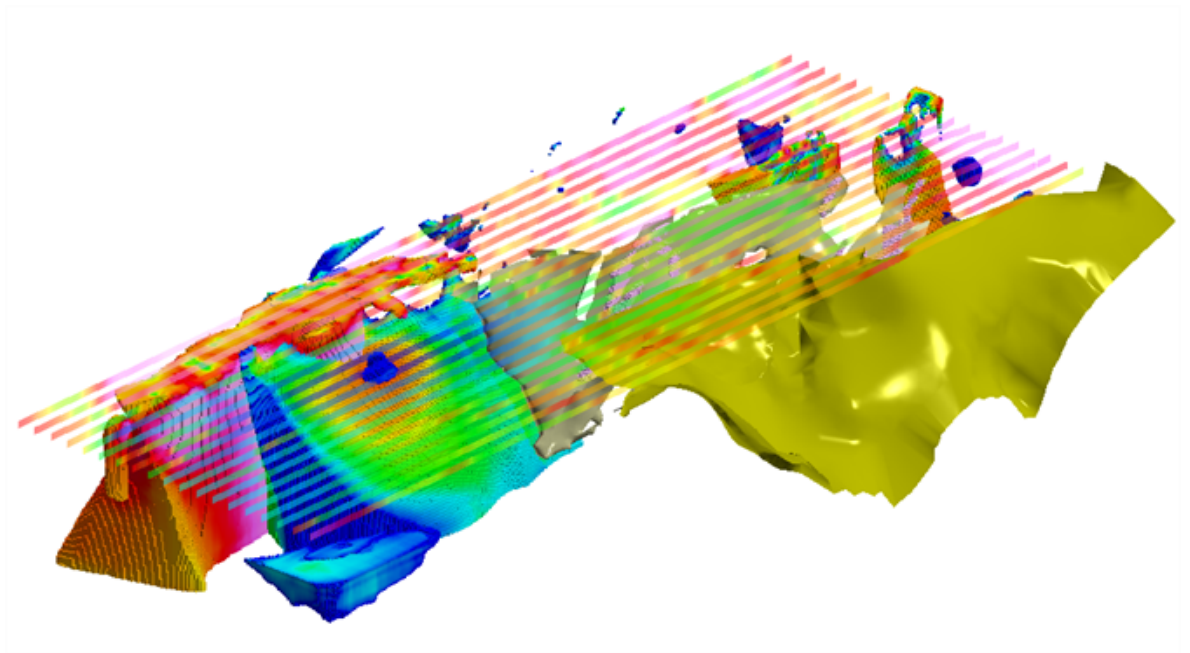
**Add geometric constraints.** Add constraints from drillhole pierce-point locations.

**Fix a layer.** Add constraints to a well-known contact throughout the model in order to keep it in place throughout the inversion.

**Insert a layer.** Add a layer in a model to begin to add complexity to the subsurface modelling.

**Create heterogeneous cells.** Split the homogenous units into smaller cells and compute weightings from three different options: depth, a proxy to distance, or full distance.

# VPem1D 4.1 - Release notes





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## Overview

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### New and updated functionality

- **Additional information about the inversion.** Multiple measures of data misfit are now written to the log file. You are given information on the Huber misfit to better understand this option. The achieved misfit based on the control file is given along with the L-1 and L-2 norms, if applicable. The chosen misfit criterion still governs the inversion. The multiple misfits are therefore not written to the screen.

```
Number of active units = 1
Total # of heterogenous cells = 2856

Initial data misfit: 2.5301E+02
Misfit goal: 1.0000E+00
Huber misfit (c=5): 5.8625E+01
Misfit (L-1): 1.5453E+01
Maximum iterations: 10

Inverting ...

Achieved misfit: 6.2640E-01
Huber misfit (c=5): 6.0904E-01
Misfit (L-1): 6.6706E-01

Prism misfits written to CSV file.
```

- **Options on how to handle data.** VPem1D has a default of merging decay curves into a single decay per prism. You now have the option of two ways of handling the data: Using all the data decays within a prism, or using the central-most single data decay.
- **Input multi-moment transmitters.** A new parameter file with the header `#VPem_MULTI#` denotes that two moments are being modelled or inverted at once. The second moment specifications are given at the end of the parameter file. The data for both moments must be in the same file.
- **Documentation and examples.** The documentation has been updated to provide examples that begin with data and topography. The ability to create models through

VPutility is used allowing you to go step-by-step through the examples. The example files come with the installation.

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