3D GeoModeller Operations

Parent topic: 3D GeoModeller User Manual and Tutorials

This manual contains instructions for all essential 3D GeoModeller operations

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- Manage geology formations
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- Create faults
- Create axial series
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- Create axial surfaces
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  - Fit a plane to Points (create orientation data)
  - Create axial surface orientation data
  - Create axial surface data (axial traces)
  - Create hinge line data

Create a project

Parent topic: 3D GeoModeller Operations

Access

Main Menu: Project - New

To create a new project is to define the 3D work-space within which you will manage the geology map, the sections and all the other elements that will be used in the construction of the 3D model.

Complete the parameter fields according to the details of your project.

The new project also defines the structure within which you gather together all of the (input) data and the various outputs built from the computed model (section plots of model geology, 3D shapes, etc.). All of these data-objects of the project are managed in a tree-structure which is presented in a special window ... the "The Project Explorer" in 3D GeoModeller Reference

Notes

- 3D GeoModeller can have only one project open at a time. If you want to save a version of your project or to work on a new project, save your current project work before loading the next one.
- The projects extents (the 'bounding box is modifiable as long as a topographic surface has not been defined. Once a topographic surface is defined, the topographic surface cannot be modified, and the bounding volume is fixed.

See also

"The project" in 3D GeoModeller Reference

Manage geology formations

Parent topic: 3D GeoModeller Operations

You can:

- Create geology formations
- Edit geology formations
- Delete geology formations

Create geology formations

Parent topic: Manage geology formations

>> To create geology formations

1. From the main menu, choose **Geology > Formations > Create or Edit**. The Create or edit geology formations dialog box appears.
2. Enter the name of the geology formation in the **Name** field.
3. Select the colour for the formation. Click the **Colour** field and select the colour from the Colour palette dialog box.
4. Choose **Add**.
5. Repeat steps 2–5 as required.
6. Choose **Close**.

Edit geology formations

Parent topic: Manage geology formations

>> To edit geology formations

1. From the main menu, choose **Geology > Formations > Create or Edit**. The Create or edit geology formations dialog box appears.
2. Select (click) the formation that you want to edit.
3. Choose **Attributes** to edit the attributes of the formation. Use the Edit geological formation attributes dialog box.
4. Choose **Appearance** to edit the appearance of the formation. Use the Appearance of an object dialog box.
5. Repeat steps 2–4 as required.
6. Choose **Close**.

Delete geology formations

Parent topic: Manage geology formations

>> To delete geology formations

1. From the main menu, choose **Geology > Formations > Create or Edit**. The Create or edit geology formations dialog box appears.
2. Select (click) the formation that you want to delete.
3. Choose **Delete**.
4. Confirm that you want to delete the formation.
5. Repeat steps 2–4 as required.
6. Choose **Close**.

Create the geological pile

Parent topic: 3D GeoModeller Operations

Access

Main Menu: Geology - Pile - Create/Edit

- Set the Reference (Top/Bottom) of the pile (i.e. specify that geology data points will define the 'Top' of a geology formation, or the 'Bottom' of the formation).
- Using the geology formations previously defined, group formations into geology series, and assemble these series into the geological pile for the project. Formations and series must be arranged in their correct stratigraphic order - from the oldest (at the bottom of the pile) to the youngest strata (at the top).
- For each series, specify the Relationship (to older series) to be either 'OnLap' or 'Erode'. (Defined on the basis of observed rock-relationships in the field ... conformable contracts, unconformities, intrusive contacts, etc.).

See also

"The geological pile" in 3D GeoModeller Reference

Create faults

Parent topic: 3D GeoModeller Operations

Access

Main Menu: Geology - Faults - Create/Edit

- Input the name of the fault.
- Choose its colour by clicking in the coloured zone. The 'RGB' tab on the colour-pallet allows you to set a specific colour by choosing numerical RGB value.

See also

"Geology data" in 3D GeoModeller Reference

"Create a network of faults" in 3D GeoModeller Reference

Create axial series

Parent topic: 3D GeoModeller Operations

Access

Main Menu: Geology - Folds - Axial series - Create/Edit

- Input the name of the axial series.
- Choose its colour by clicking in the coloured zone. The 'RGB' tab on the colour-pallet allows you to set a specific colour by choosing numerical RGB values.

See also

Create axial surfaces

Link faults with geology series

Parent topic: 3D GeoModeller Operations

Access

Main Menu: Geology - Link faults with series

This dialog defines the influence of a fault on each series of geology formations. To do this, use the table and mark [x] to define which fault affects which series.

Series are defined during the process of defining the "The geological pile" in 3D GeoModeller Reference.

See also

"Geology data" in 3D GeoModeller Reference

"Edit the geological pile" in 3D GeoModeller Reference

Create axial surfaces

Parent topic: 3D GeoModeller Operations

Access

Main Menu: Geology - Folds - Axial surfaces - Create/Edit

- Input the name of the axial surface.
- Choose its colour by clicking in the coloured zone. The 'RGB' tab on the colour-pallet allows you to set a specific colour by choosing numerical RGB values.
- Choose the type of fold (Anticline/Syncline).
- Select the associated axial series.

See also

Create axial series

Define a network of faults

Parent topic: 3D GeoModeller Operations

Access

Main Menu: Geology - Faults - Link faults with faults

With this function you can specify that one fault stops on another. Using the table, you can define a 'network' of faults.

See also

"Geology data" in 3D GeoModeller Reference

Create faults

Define the topographic surface

Parent topic: 3D GeoModeller Operations

Access

- Main Menu: Topography - from a DTM (using an ASCII file in "File Formats: Grids" in 3D GeoModeller Reference)
- Main Menu: Topography - from a GDM grid ("File Formats: Grids" in 3D GeoModeller Reference is a BRGM internal grid file format)
- Main Menu: Topography - by a horizontal plane (if you want a simple horizontal planar topography at a specified elevation or RL)

The topographic surface is essential in a project. It defines the upper limit of the 3D geology model; the 'geology map' for your project area is created from the intersection of this topographic surface and the (mathematical) 3D model.

Create a section

Parent topic: 3D GeoModeller Operations

Access

- 2D Viewer Pop-up Menu: Create a section - From its trace (if you defined its trace on the topography or in another section - using the Points List)
- 2D Viewer Pop-up Menu: Create a section - Horizontal (if you want to create a horizontal planar section)

To create a section 'from its trace' you must first draw the trace of the required section-line on topographic surface (or in another section-view) using the "Introduction to the Points List" in 3D GeoModeller Reference. Notes

In a 2D Viewer, a section is presented in its 2D space. True 'along-line' distances are preserved; the section is **not projected** onto the 2D Viewer plane.

This transformation implies a change of coordinate system [(x, y, z) to (u, v)]. By default the coordinates of the 1st point of the trace of the section in 2D space are fixed at u = 0 and v = z (i.e. v = z= its height or RL). Note: u is the section's x-axis, v is the section's y-axis (typically a 'height'-axis).

In the dialog for the creation of a section, you can modify the coordinates for this section-origin point; Once the section has been created, however, no further modification is allowed.

See also

"Sections" in 3D GeoModeller Reference

Import geology

Parent topic: 3D GeoModeller Operations

Access

2D Viewer Pop-up Menu: Import

The import function allows you to import geology and structural data, or other geological entities, into the 2D space of a section or the map-view. Data can be imported from Mif/Mid data exchange files (i.e. MapInfo Mif/Mid), or from 'comma separated variables' (csv) files.

See also

"Structural data" in 3D GeoModeller Reference

Input geology

Parent topic: 3D GeoModeller Operations

The inputting of geology on the map or in sections consists of creating the "Structural data" in 3D GeoModeller Reference ... geology data (contacts and fault locations), geology orientation data, fold axial surface data (axial traces), axial surface orientation data (locally, the axial plane) and hingelines ... which will be used to compute the 3D model:

- Create geology data
- Create geology orientation (structural) data
- Create axial surface data (axial traces)
- Create axial surface data (axial traces)
- Create hinge line data

Import drillholes

Parent topic: 3D GeoModeller Operations

Access

- Main Menu: Drillholes - Import GDM
- Main Menu: Drillholes - Import ASCII

Two types of drillhole data-file formats can be imported into 3D GeoModeller: GDM (a BRGM in-house file format) or ASCII.

See also

"Drillholes" in 3D GeoModeller Reference

Compute the 3D model

Parent topic: 3D GeoModeller Operations

Access

Main Menu: Model - Compute

Having created or loaded geology data (and geology orientation data, faults, fold axial data, ...), you can compute the 3D geometrical model.

See also

"The 3D model" in 3D GeoModeller Reference

Plot the model in a section

Parent topic: 3D GeoModeller Operations

Access

2D Viewer Toolbar: 'Plot the model' Button 

Having computed the 3D model, you can plot (render, or draw) the model-geology on the topographic surface (map) or any other section. In effect, this plot is simply the intersection between the (mathematical) model and the selected map or section.

See also

"The 3D model" in 3D GeoModeller Reference

Build 3D shapes (of model geology)

Parent topic: 3D GeoModeller Operations

Access

Main Menu: Model - Build 3D shapes

Having 'computed' a (mathematical) model from the geology and structural data of your project, you can 'build' various forms of 3D shapes of the model geology - for each of the formations of the project. When built, these 3D 'shapes' will be rendered in the "The 3D Viewer" in 3D GeoModeller Reference. The displayed shapes will vary, according to the 'type' of 3D shape built; '3D Volumes', for example, will be rendered as closed volumes for each formation, each defined by triangulated surfaces.

See also

"The 3D model" in 3D GeoModeller Reference

Structural data

Parent topic: 3D GeoModeller Operations

In this section:

Create geology data

Parent topic: Structural data

Access

2D Viewer Toolbar: 'Create geology data' Button 

When you have geology contacts (or interfaces), or fault locations, known from outcrops, etc., you can input these geology observations on the map-view or in a section view. These data will then be used, together with other structural data, to compute the 3D geometrical model.

You can input geology data points either one by one, or as a group of data points (provided that all points belong to a single geology surface, such as the 'top of a formation', or a specific fault).

To create geology data points:

- Using the "Introduction to the Points List" in 3D GeoModeller Reference, mark one or more points to define the position of a given geology feature on the map-view or in a section.
- Click the 'Create geology data' button  on the 2D Viewer's toolbar.

See also

"Structural data" in 3D GeoModeller Reference

Create geology orientation (structural) data

Parent topic: Structural data

Access

2D Viewer Toolbar: 'Create geology orientation data' Button 

You can input or edit geology orientation data on a map-view or in a section. This information will be used, together with other structural and geology data, to compute the 3D geometrical model.

Geology orientation data are input individually, one dip/strike point at a time.

To create geology orientation (structural) data (dips and strikes, as orientation data points):

- Using the "Introduction to the Points List" in 3D GeoModeller Reference, mark either one point (a position only) or two points (defining position and strike-direction) on the map-view or in a section.
- Click the 'Create geology orientation data' button  on the 2D Viewer's toolbar.

See also

"Structural data" in 3D GeoModeller Reference

Fit a plane to Points (create orientation data)

Parent topic: Structural data

Access

2D Viewer Toolbar: 'Fit a plane to Points' Button

This button computes the dip and the dip-direction of a plane 'fitted' through several points. This is useful when you have outcrops of a formation, or the limits of this formation on the DTM, but have no strike and dip measurements. For this computation, 3D GeoModeller 'fits' a plane (representing the average geological surface) through the listed points.

The resulting orientation value (dip-direction and dip) can be used to create new orientation data either at all of the Points, or at a single point (defined either by inputting coordinates, or using the Current Point of the "Introduction to the Points List" in 3D GeoModeller Reference). In both cases, the selected points used for the calculation, or the single point to be assigned the 'result', are transformed into orientation data, identical to any other (measured) orientation data point.

See also

"Structural data" in 3D GeoModeller Reference

Create axial surface orientation data

Parent topic: Structural data

Access

2D Viewer Toolbar: 'Create axial surface orientation data' Button

You can create or edit axial surface orientation data (measurements of the axial plane) on a map or a section view. This information will be used, together with other structural and geology data, to compute the 3D geometrical model.

Axial surface orientation data are created one point at a time.

To define axial surface orientation data (locally, an axial plane):

- With the "Introduction to the Points List" in 3D GeoModeller Reference, place a single point (for position only), or two points (for position and direction) on the map or section-view
- Click the 'Create axial surface orientation data' button on the 2D Viewer Toolbar

See also

"Structural data" in 3D GeoModeller Reference

Create axial surface data (axial traces)

Parent topic: Structural data

Access

2D Viewer Toolbar: 'Create axial surface data (Axial traces)' Button

When you know (from outcrop) the trace of a fold axis, you can input this on a map or a section view. This information will be used, together with other structural and geology data, to compute the 3D geometrical model.

To create axial surface data (an axial trace):

- With the "Introduction to the Points List" in 3D GeoModeller Reference, input the points defining the position of the fold axis on the map or section-view.
- Click the 'Create axial surface data (Axial traces)' button on the 2D Viewer's toolbar.

See also

"Structural data" in 3D GeoModeller Reference

Create hinge line data

Parent topic: Structural data

Access

2D Viewer Toolbar: 'Create hinge line data' Button

When you know (from outcrop) the hinge line of a fold, you can input this on a map or a section view. This information will be used, together with other structural and geology data, to compute the 3D geometrical model.

To create a hinge line:

- With the "Introduction to the Points List" in 3D GeoModeller Reference, input points which define the hinge line on the map or a section-view.
- Click the 'Hinge line' button on the 2D Viewer's toolbar.

See also

"Structural data" in 3D GeoModeller Reference