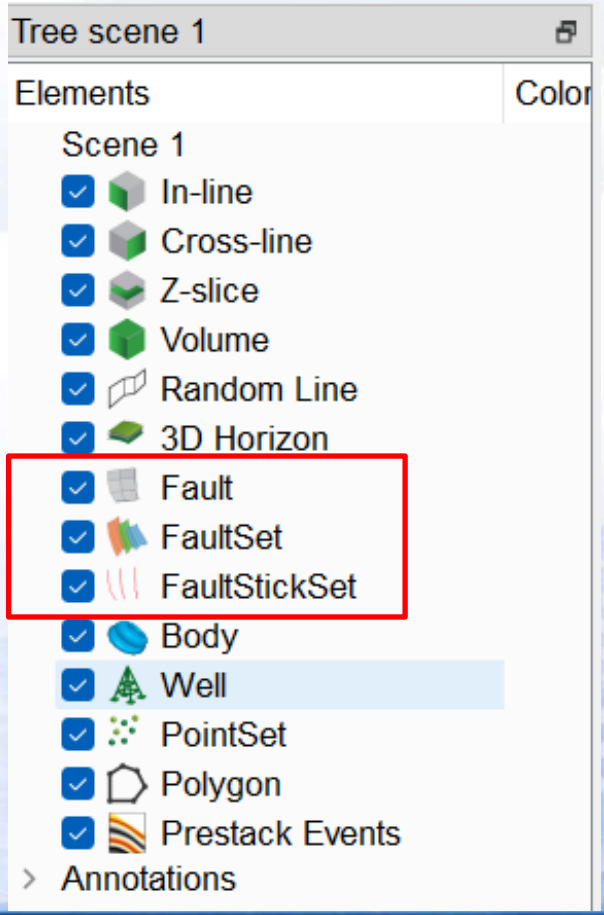
3 Tree和Elements

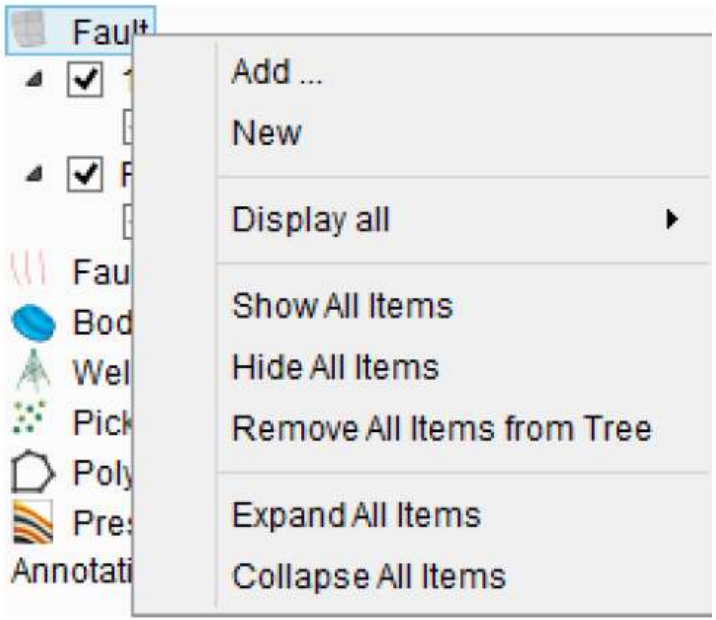


3.9 Fault

FaultSet

3.10 FaultStickSet

3.9 Fault



The fault option enables interpretation of either a new fault or loading an existing one.

Add: Adds selected faults into the tree and displays them in the scene:

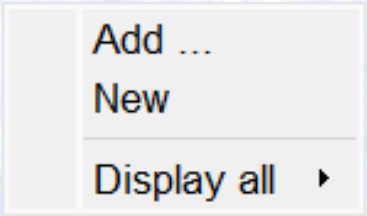
New: Adds an empty fault in the scene (New fault 1) that needs to be named and saved once the interpretation is completed.

Display all: If more than one faults have already been displayed or added in the tree, this option will be available. It is used to display all faults in full, only at sections, or at horizons, or both. It is also used to toggle On/Off the fault plane, sticks and both displays.

Show all items: It is used to check all items, which means that all items would be displayed in the scene. 没有了

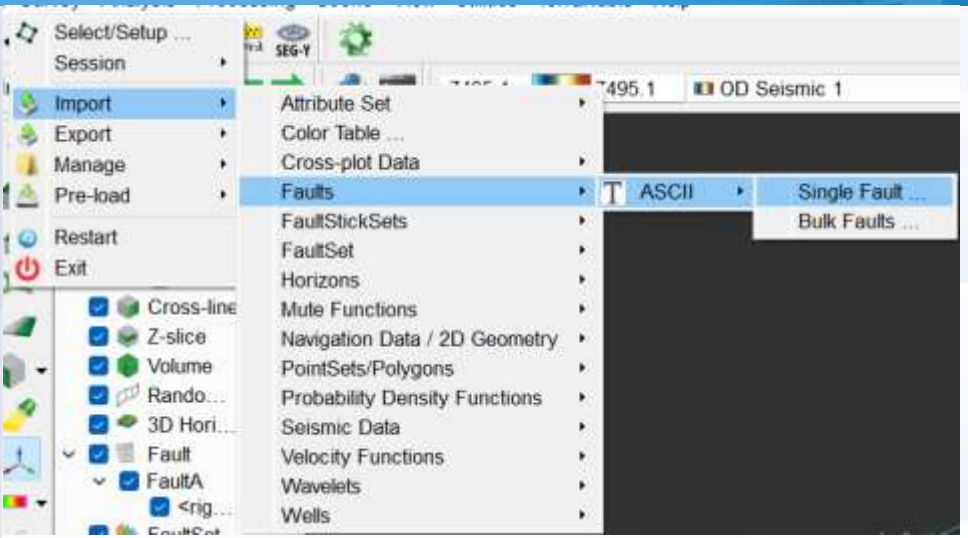
Hide all items: It is used to hide all (check out) the displayed faults.

Remove all items: To remove all faults that are added in the tree, this option is used.

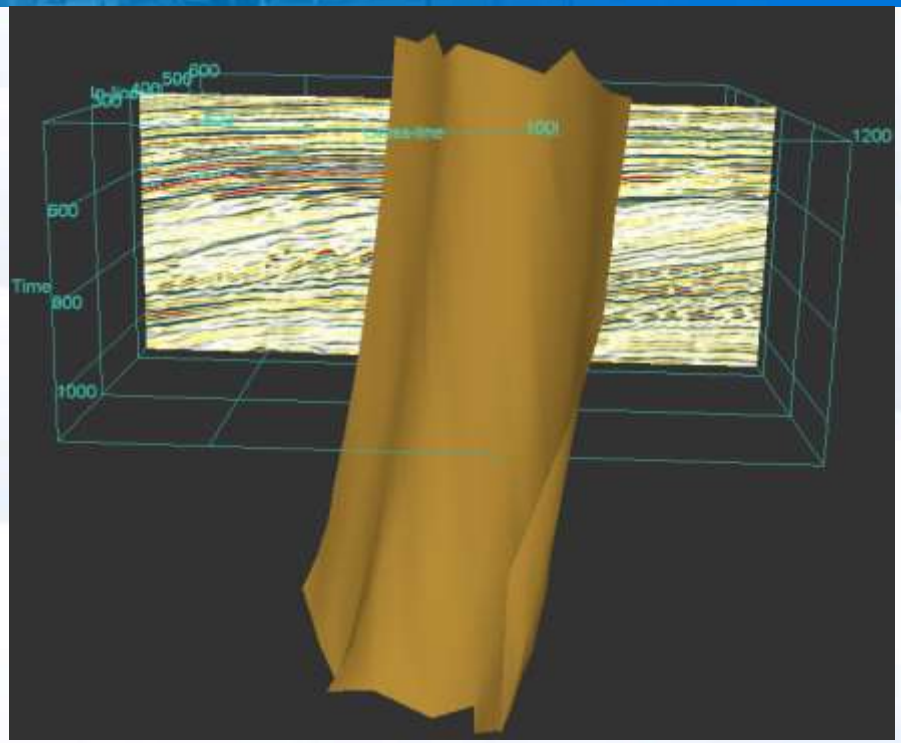


GNU版本

RawData/FaultA.xyt



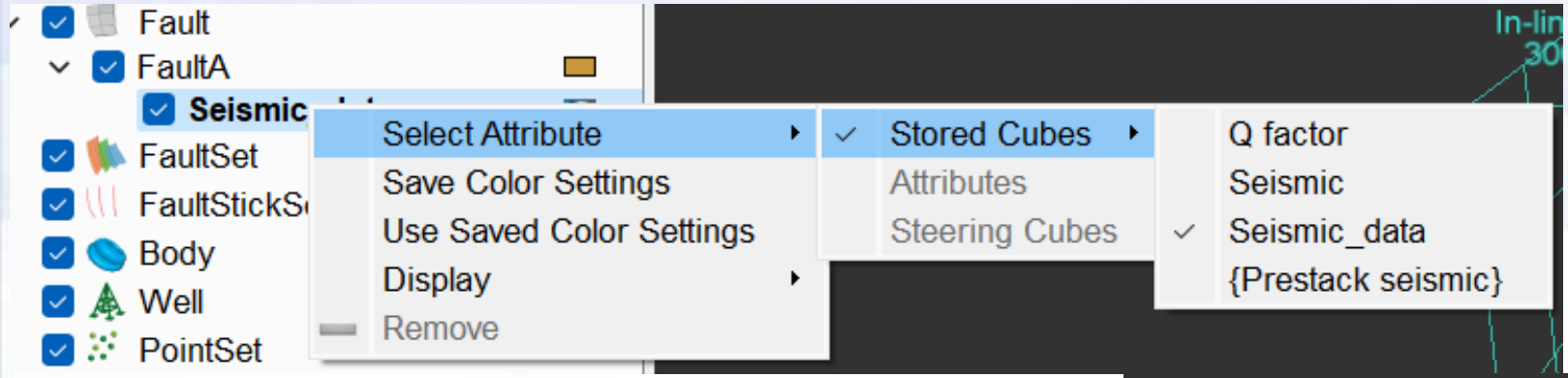
加载断层：
Survey>Import>Faults>ASCII>Single



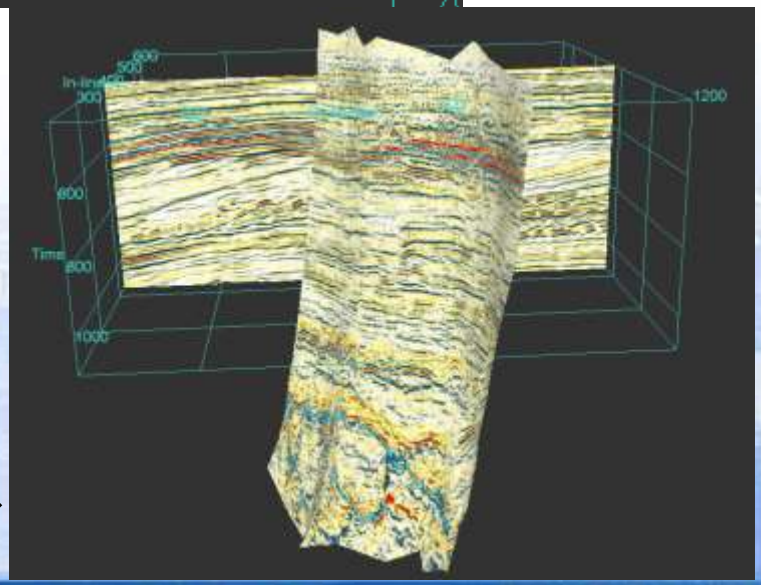
加载FaultA断层后

An example of a picked fault line on a seismic section:

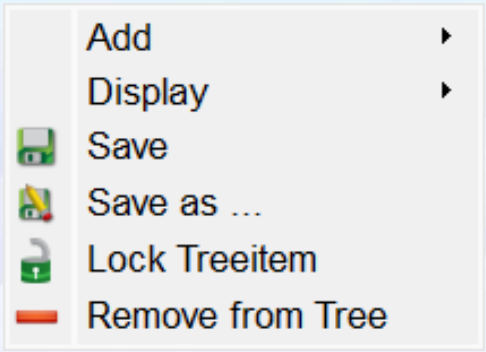
Once a fault has been added, right-clicking will pop-out the following menus :

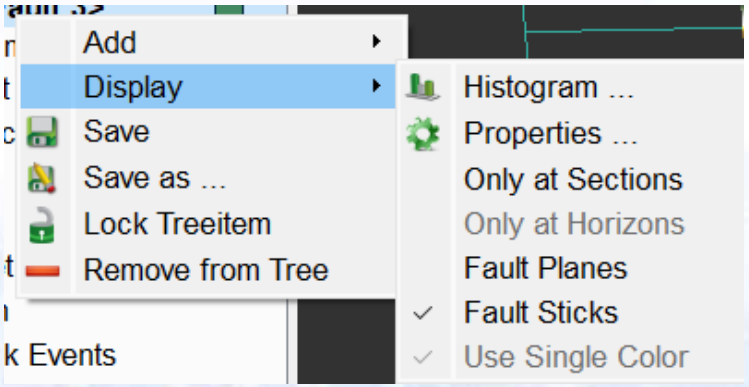


加载断层后，右击，弹出菜单



选择Seismic Data属性 →





Add

Attribute: Add a new attribute for fault element. Right click and choose 'Select attribute' to select the desired seismic volume. The attribute will be displayed along fault planes. The example line with interpreted faults in a 3D volume has been shown below. Note that the faults have seismic data displayed as an attribute along their planes.

Volume Processing Attribute: It is used to add a special sub layer to the fault that belongs to volume processing attribute. To read more about this, please go to the Volume Builder Setup chapter.

Display

Histograms: It shows multiple histograms of the displayed data along the selected fault plane.

Only at sections: It is a toggle that is used to display a fault plane on a section as a stick.

Only at horizons: To display a fault plane on a horizon as a fault trace, this option could be toggled On/Off.

Fault planes: If a fault has been displayed either on a section or a horizon, it can be back into a 3D fault plane. This option toggles On a fault plane display.

Fault sticks: To see the fault sticks only in 3D, this option should be toggled on.

Use single color: It sets a single color to a fault plane display. Any displayed attribute along the fault plane will become hidden an only the fault color would be displayed.

Properties: Set the Type, Size, and Color of the point markers on the graphics area.

Save: It saves the selected fault.

Save As: To save the selected fault with a new name, this option is used.

Lock: Lock the selected object. Prevents accidental removing, moving, or displaying data on object. After clicking on *Lock* again (i.e unlocking), editing is enabled.

Remove: It removes the selected fault from the scene.

Select Attribute: It is used to select and display various types of data(see below).

Stored Cubes: Any stored volume could be displayed along the fault plane in 3D.

Attributes: Any attribute defined in the Attribute set window could be displayed. This requires a pre-defined attribute set in the Attribute set window. It will be inactive if no attribute is defined in that window.

SteeringCubes: If a SteeringCube has already been pre-processed it can be selected and displayed along the fault plane.

Save Color Settings: The active color table could be stored permanently or updated for the displayed stored attribute. For instance, if you do not like the color bar for a particular seismic data (say PSTM) that is Red-white-blue (color table) and you want to change it into Magic, you could set it here. It will save the colour settings for this specific stored volume (PSTM).

Move: To change the display level of an attribute, it can either be moved up / down or placed to top / bottom.

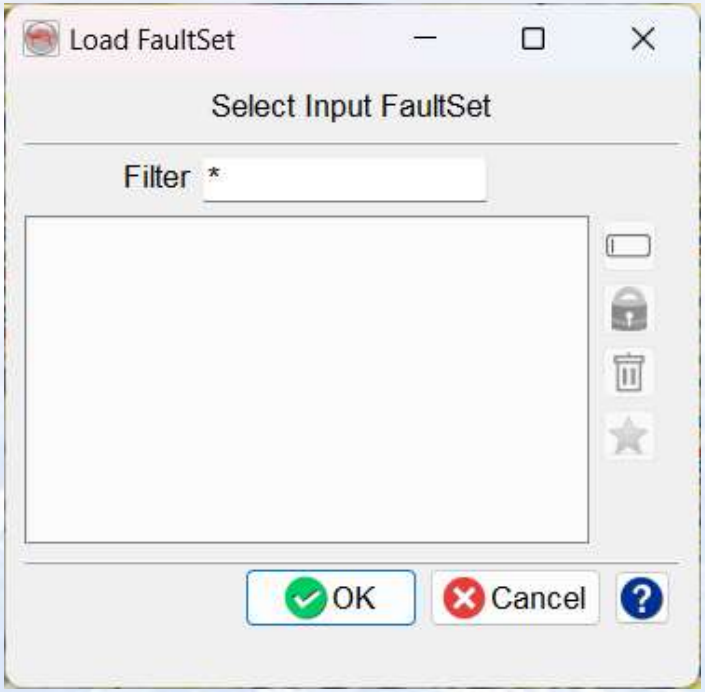
Display: To make a fault semi-transparent, the transparency is used. One can also visualize the histogram of the attribute.

Remove: It remove the selected attribute from the tree.

For Fault interpretation, please see the interpret faults chapter 附录D

见断层解释操作.pptx

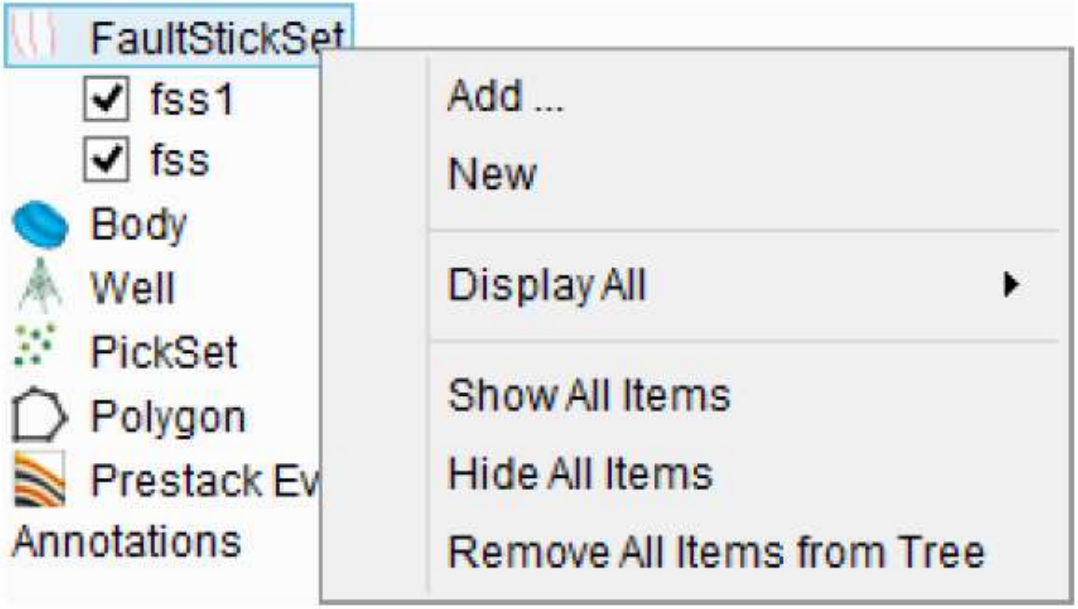
FaultSet 只有Add



3.10 FaultStickSet

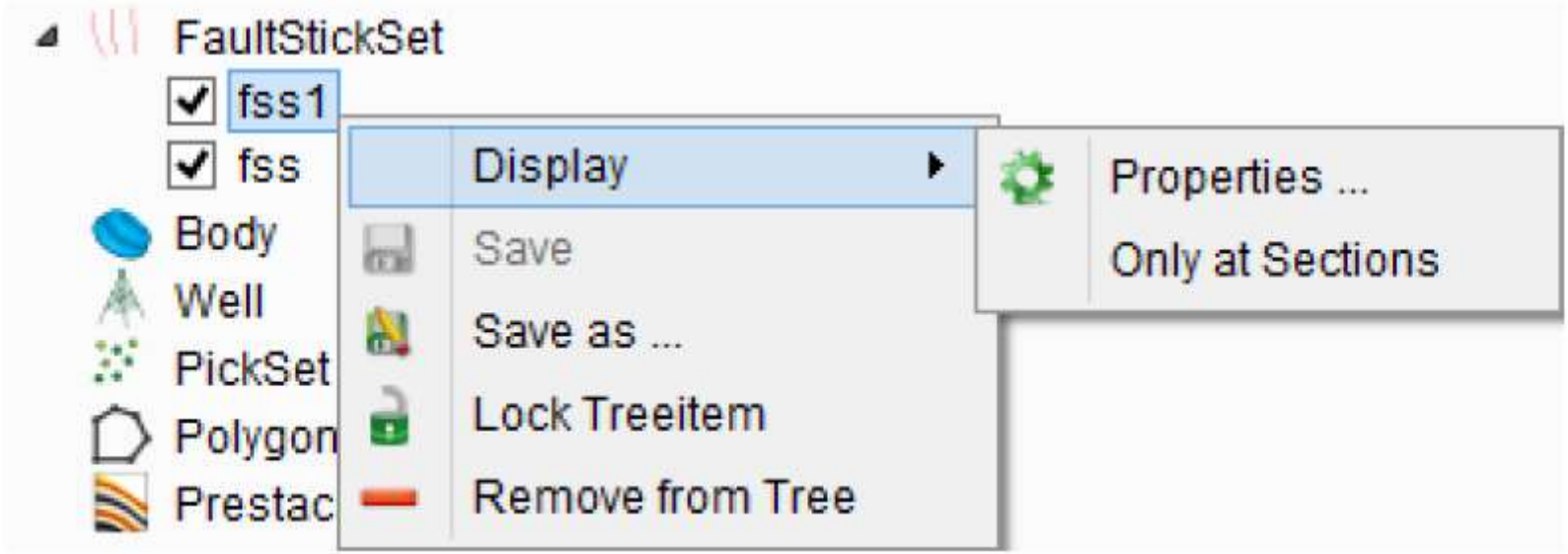
A *FaultStickSet* is a set of sticks for faults interpretation. Sticks are segments that are created by connecting two or more nodes.

The *FaultStickSet* tree item allows the user to create a new *FaultStickSet* or to load an existing one.



The new FaultStickSet is inserted by selecting the *New* option in the tree. The blank fault *New sticks 1* will be inserted as sub-element of FaultStickSet.

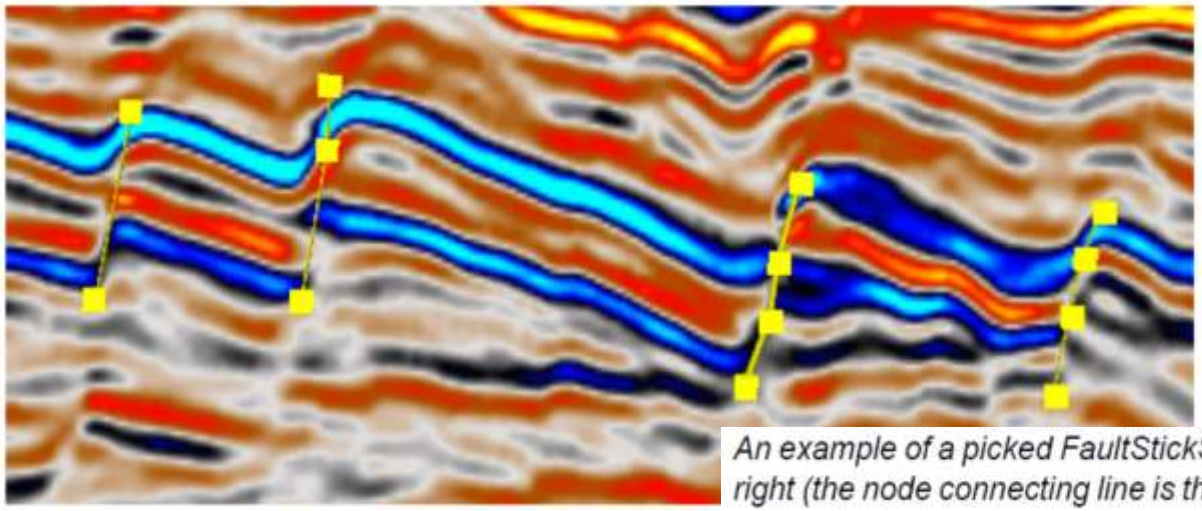
The user can then interpret the fault sticks on inline/crossline/Zslice and/or on 2D lines as well.



In order to create and edit a faultstickset, check first that the faultstisckset is active in the tree, then do the following:

1. Click along the fault to create your first fault stick for one specific section .
2. The second fault stick in the same section is created by *shift* + *leftclick* for the first point then just *leftclick* for the next faultstick(s)
3. To remove a fault stick node, *Ctrl+leftclick* on the already picked nodes.
4. Once you are done with one section, move to another inline/crossline/timeslice/ or 2D line to create new fault sticks. A simple click will start the fault stick creation.
5. If you want to edit one stick while being busy with another, just click on one of it nodes to make it active. While editing, you can click and drag a node to another position.

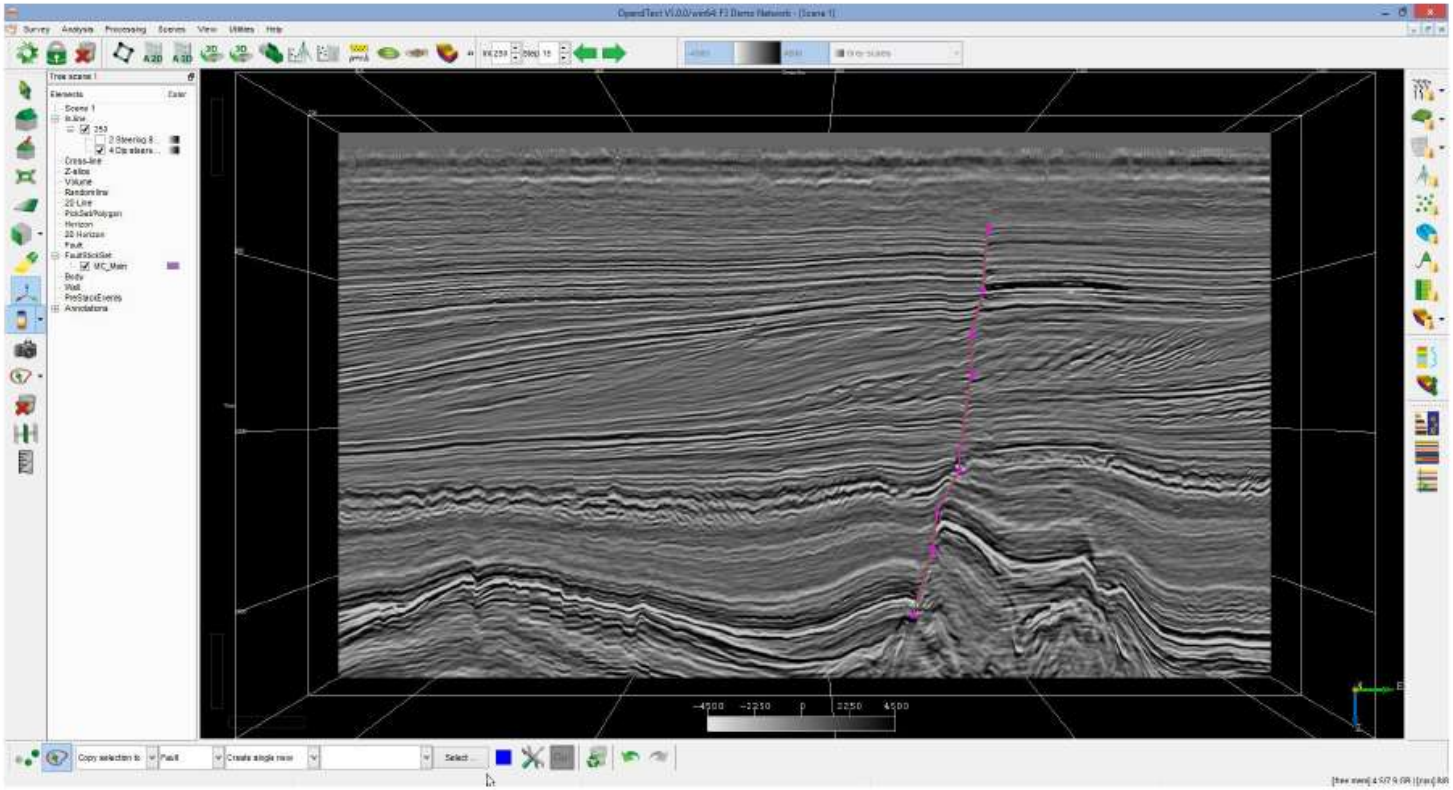
After interpreting the FaultStickSet, use the option *Save* to save your set with an appropriate name.



An example of a picked FaultStickSet with nodes, the active stick is the second from right (the node connecting line is thicker)

3.10.1 FaultStickSet to Fault 转换

In OpendTect, newly interpreted faultsticksets (or a selection) can be transformed into 3D faults and vice versa, from 3D faults the user can output faultsticks.

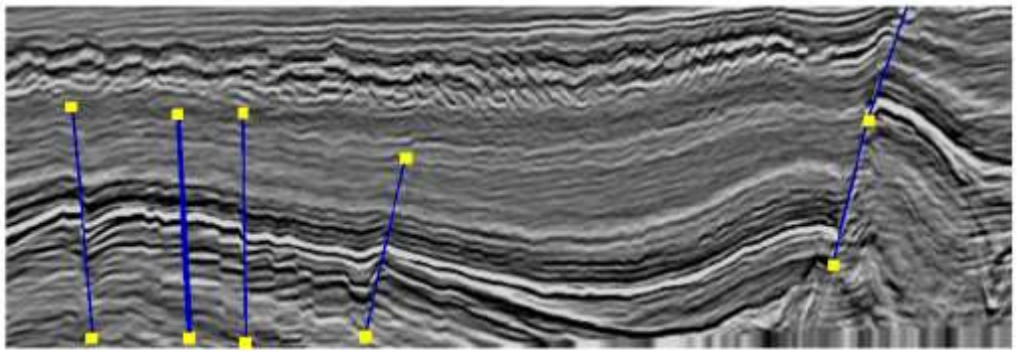


The conversion between faults and faultsticks is done in a special toolbar as shown below:

In the toolbar, they are two modes: The **Edit mode** and the **Selection mode**:

Edit Mode: In this mode, nodes are yellow, the user can add nodes (click), remove nodes (Ctrl+click). Nodes can be dragged from one location to another. New sticks are created by Shift+click for the first node then just click for other sticks.

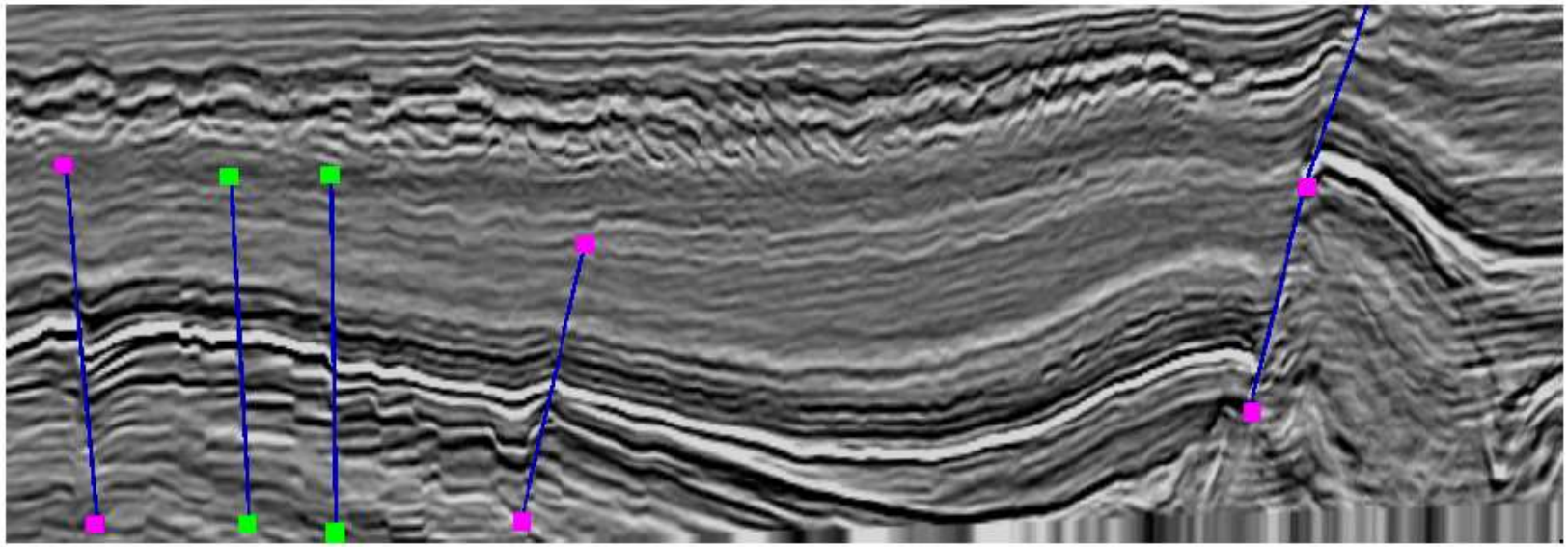
When using Space+click, this will duplicate the node(s) and new sticks can be added to the user-defined direction.



Nodes are yellow in *Edit Mode*

Selection mode: When this mode is active, Faults/Faultsticks are selected, copied (or moved) to new or already existed faults/sticks group. The outputs are: New group, merge to existing one, replace (overwrite) the already existed group.

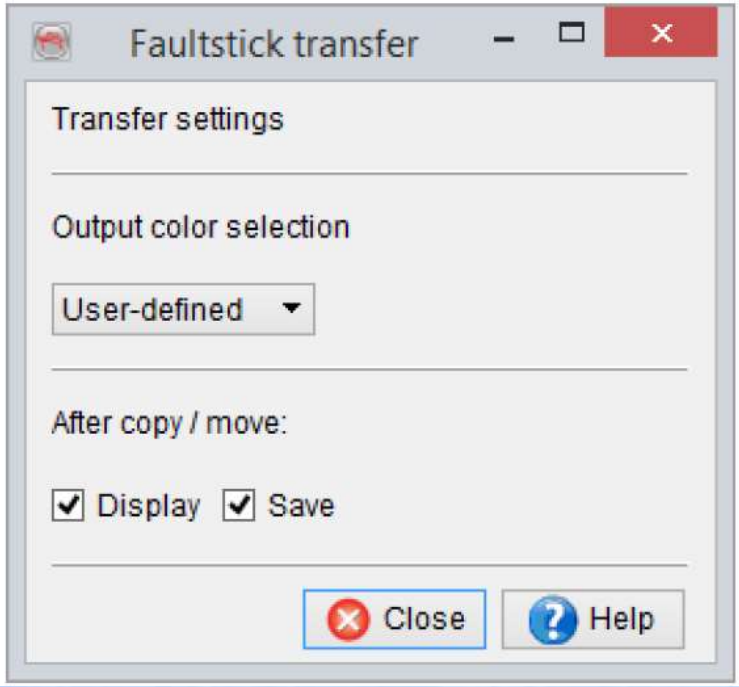
Creating new group of faults/sticks in series will automatically rename group by adding a suffix to the first new group name provided by the user. If the name is e.g Fault-Area then automatically generated names will be like, Fault-Area_1, Fault-Area_2, Fault-Area_3 etc ....



In *Selection Mode*, Nodes are green (selected) and pink (unselected)

When converting faultsticks into faults, please keep in mind that OpendTect doesn't support the files that contain (1) Crossing fault sticks, (2) Fault sticks interpreted on vertical (e.g. inline) as well as horizontal (e.g. Z slice) planes. If the input file contains such type of stick sorting, you might encounter problem in OpendTect to get a regular fault plane.

Clicking the icon allows you to set the transfer (or conversion) settings which will be applied after the copy or move is put into action:



转换faultsticks为faults时，注意Opendtect不支持：
(1)交叉的fault sticks；
(2)垂直面(inline)和水平面(z-slice)上解释的faultsticks