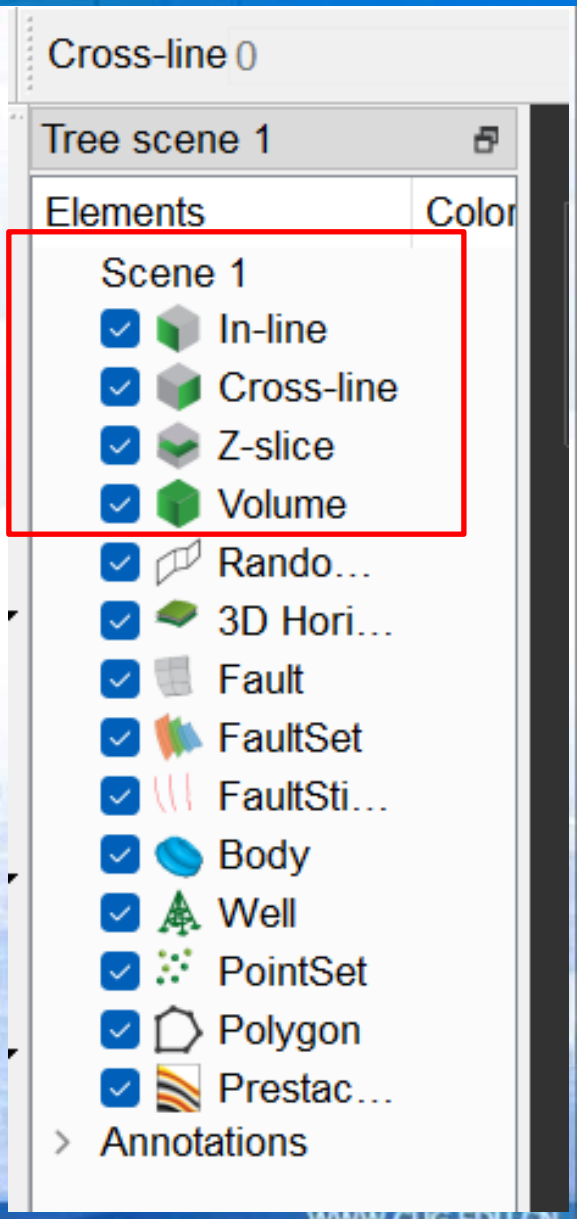
# 第3章 Tree和Elements

**3.1 Scene**

**3.2 Inline, Crossline, Z-slice**

**3.3 Volume**



# 3.1 Scene

视图(Scene)就是一个工作窗口，包含一个树状结构(Tree)。

可以在三个独立的域工作：Time-domain, Depth-domain, Flattened and Wheeler-domain。(地层单元的时间域)

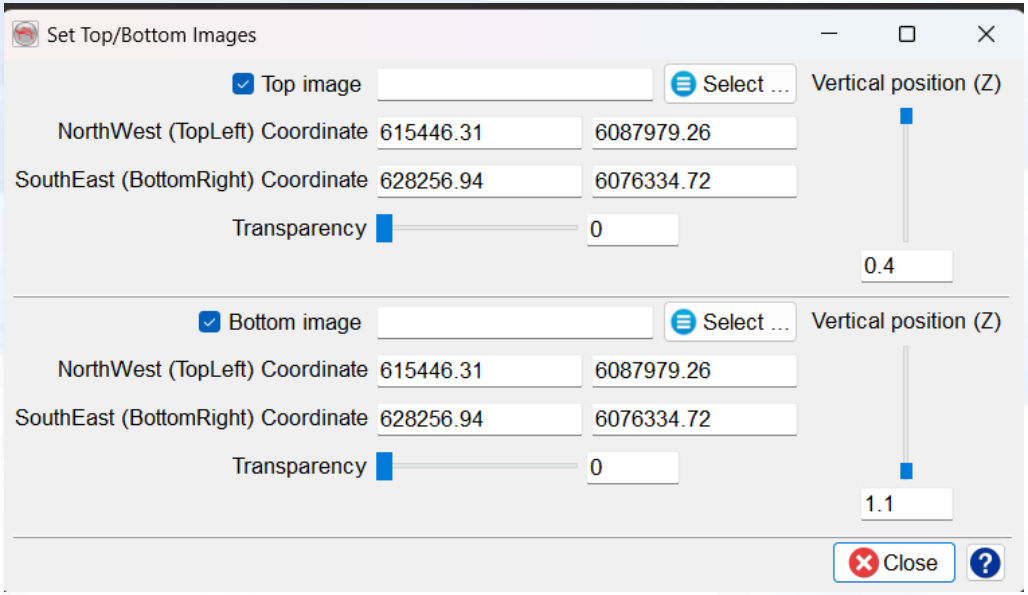

Scene Properties，右击视图名，例如Scene>Properties，会弹出下面的窗口：

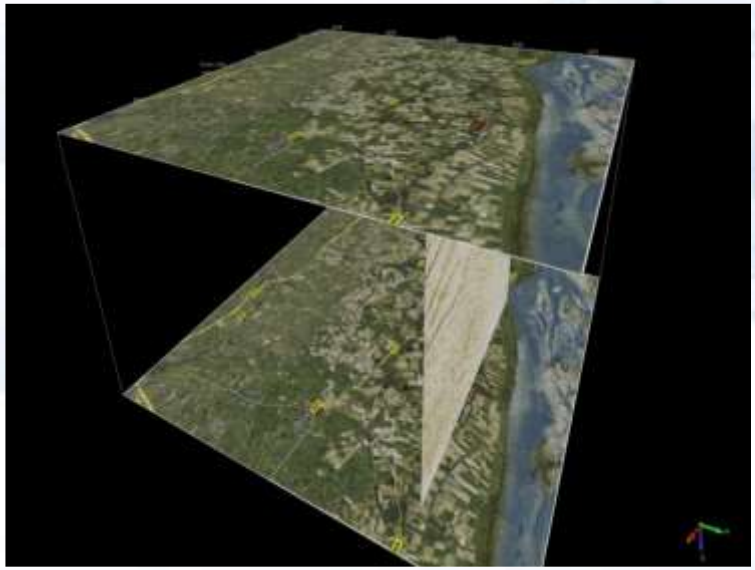

In this window, the following options can be set for the specific scene:

- *Survey box:* If checked, a 3D survey box will be shown in this specific scene.
- *Annotation text:* If checked, the survey box annotations (inline, crossline, TWT) will be displayed in the scene.
- *Annotation scale:* If checked, the numeric values of inlines, crosslines and Z-values will be displayed.
- *Background Color:* The user can specify his/her own background color for particular scene. By default it is black.
- *Mouse Marker Size:* This option is used to increase the Mouse Marker (a marker pointing mouse location on multiwindows) size on various windows in multiscene view.
- *Mouse Marker Color:* The color of Mouse Marker can be changed from here. The default color is white.
- *Annotation color:* The color of Annotation can be changed from here. The default color is white.
- *Line/Surface separation:* The user can change the setting between Line and Surface separation as shown below

## Top/Bottom image

This feature is specially useful to add any reference map of the survey to understand the geographical position and corresponding seismic profile in a better way.



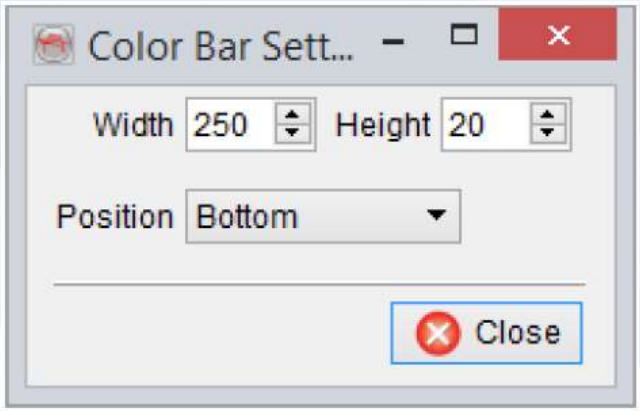
You can use the Google export tool to convert the survey boundaries to latitude and longitudes. They can be then imported into a mapping program (like Google Earth) in order to take the appropriate screenshot.

The **Scene Color Bar Settings** can be used to set the position and size of the colorbar in the scene:

从Google Earth输出带WGS坐标的地图，作为地震解释工区顶部和底部的参考底图。

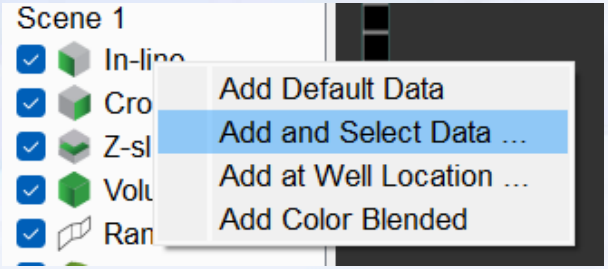
## Scene Color Bar Settings

设置视图中，工具条的位置和大小。



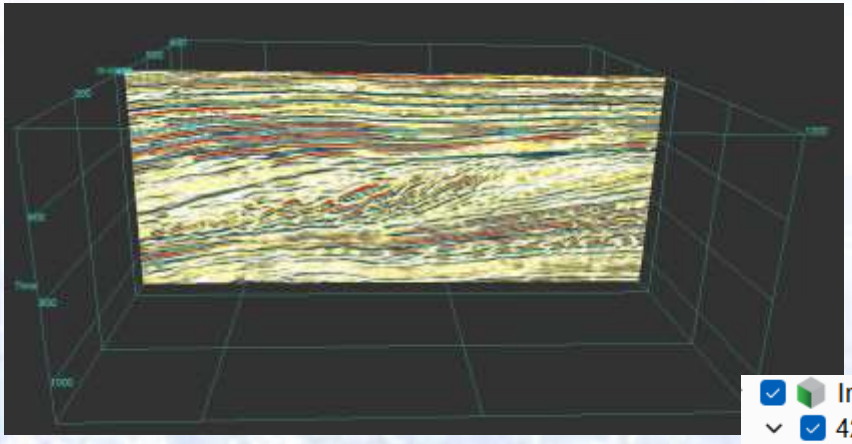

The **Export scene** option is only made for the debugging purposes. The export option dumps the scene information into a *.osg* file (OpenSceneGraph), which can be sent to OpendTect and used for bug analysis.

# 3.2 Inline, Crossline &Z-slice

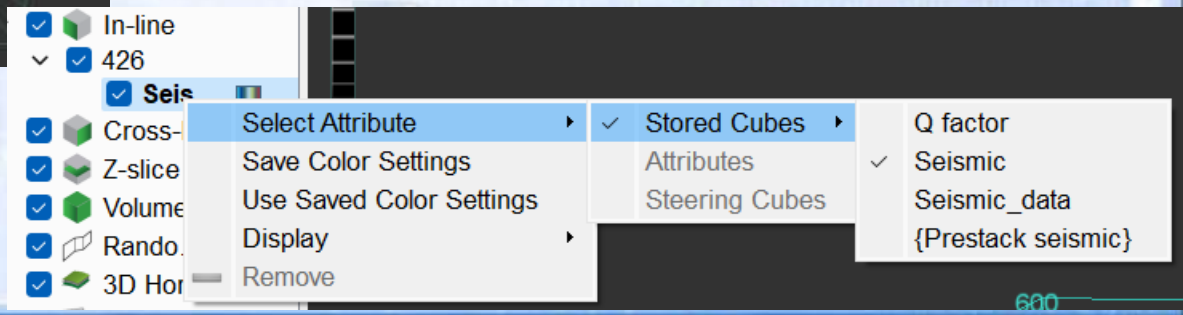



点击Element名称，选择Add default data/Add color, 向Tree增加Inline, Crossline &Z-slice元素。

下面展示向Element添加Inline/CrossLine/Z-slice的功能。

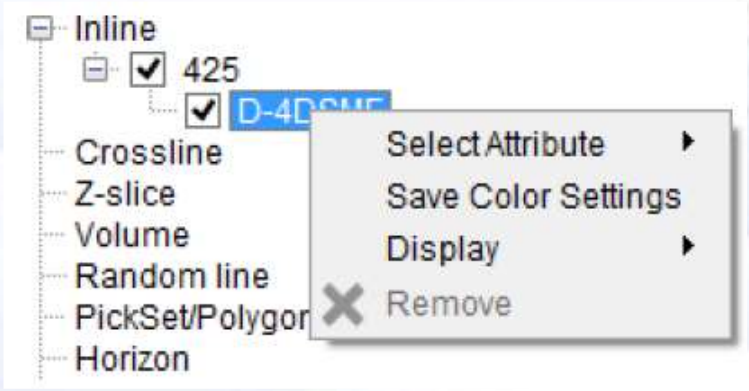


Add default data



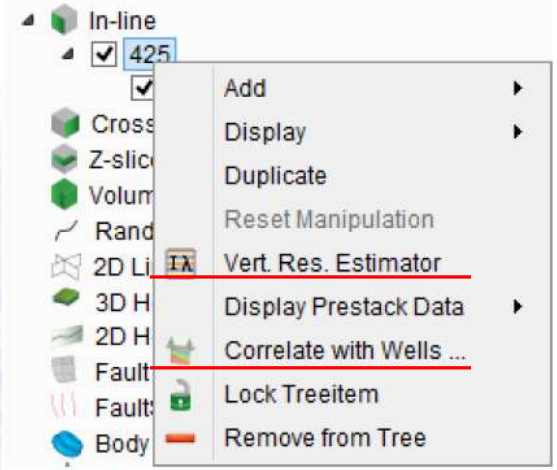
# 3.2 Inline, Crossline &Z-slice

显示属性后，可右击操作它。

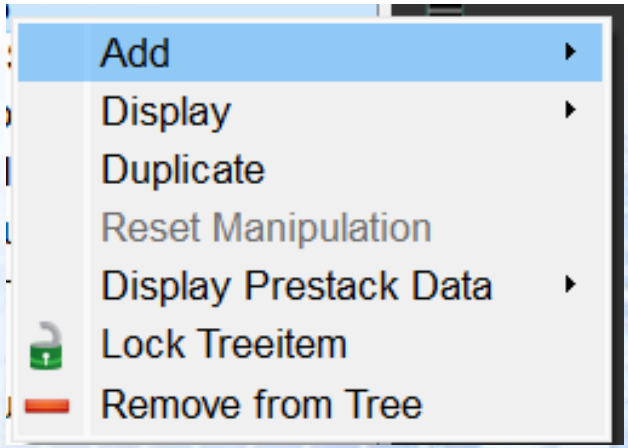



**Pop-up List Menus**

各元素(Inline，Crossline &Z-slice)有类似的pop-up列表菜单，如下图。

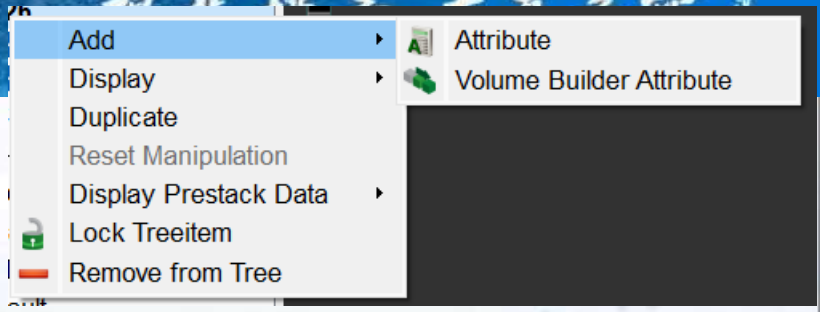



手册截图




GNU OpendTect-6.6

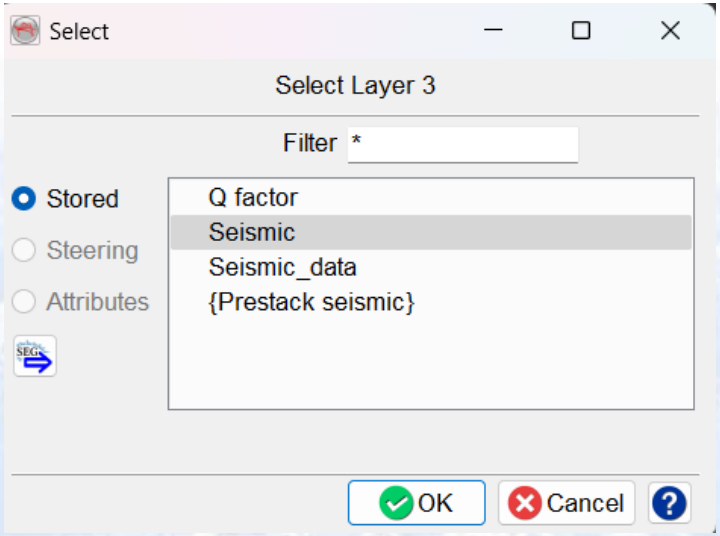
# 下面介绍Pop-up List Menus中的功能

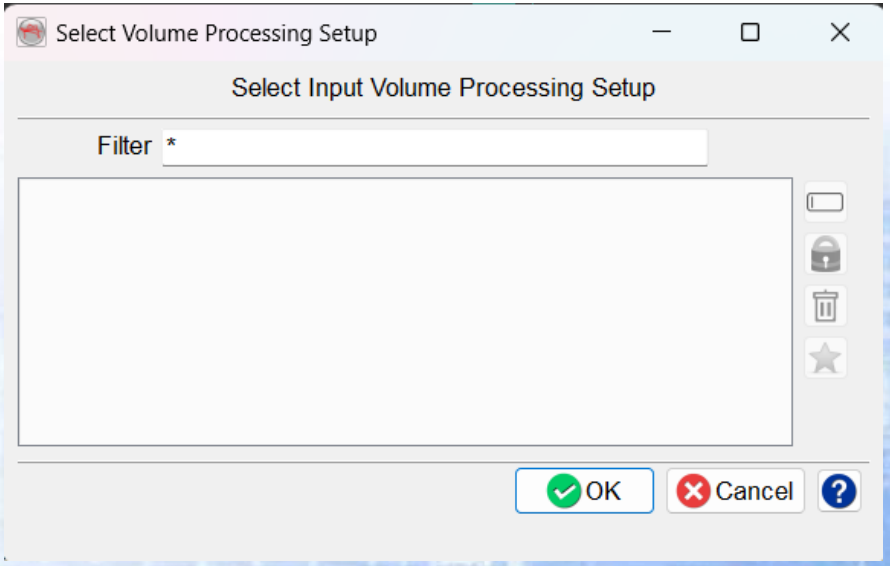


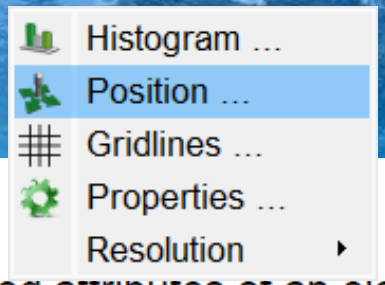

Add: (与手册内容有差异)

(1) Attribute: 添加对应inline/crossline/Z-slice数的空白属性。属性数据（存储为cubes或属性定义）可右击显示，选择期望的属性。一个Element (inline/crossline/Z-slice)最多可现实8种属性。

(2) Volume Builder Attribute: 导入数据体处理的设置。

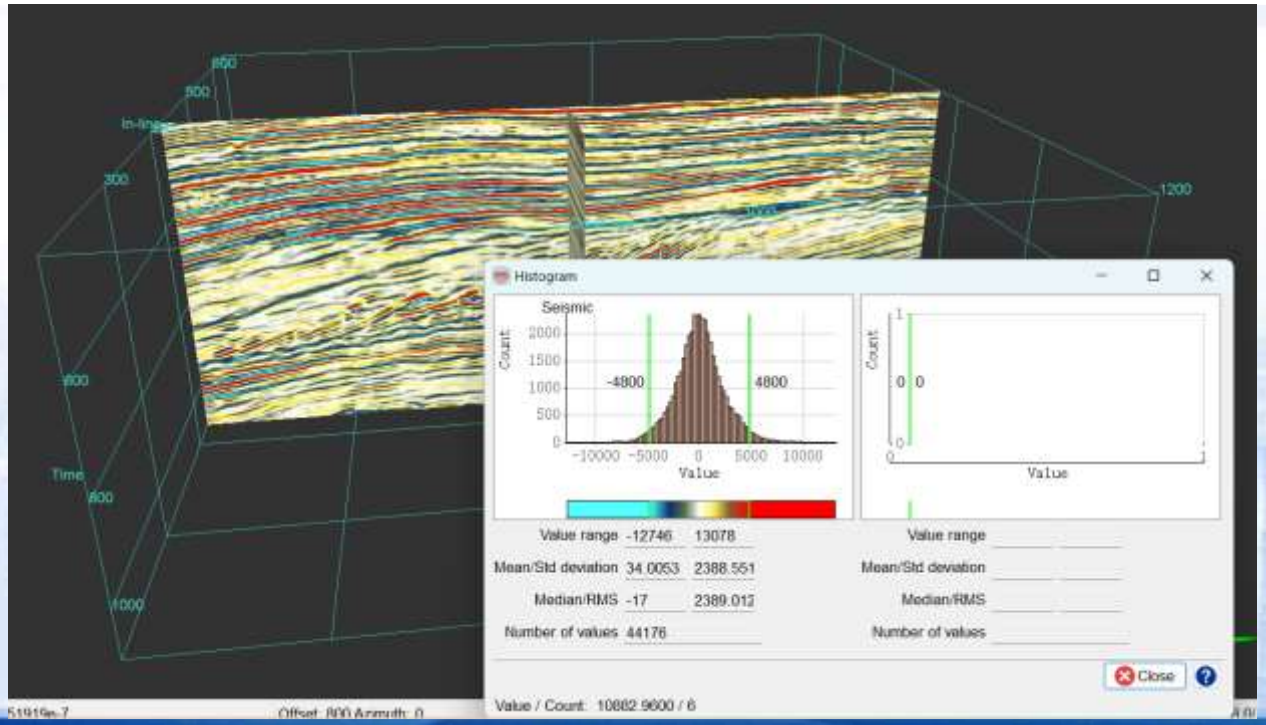




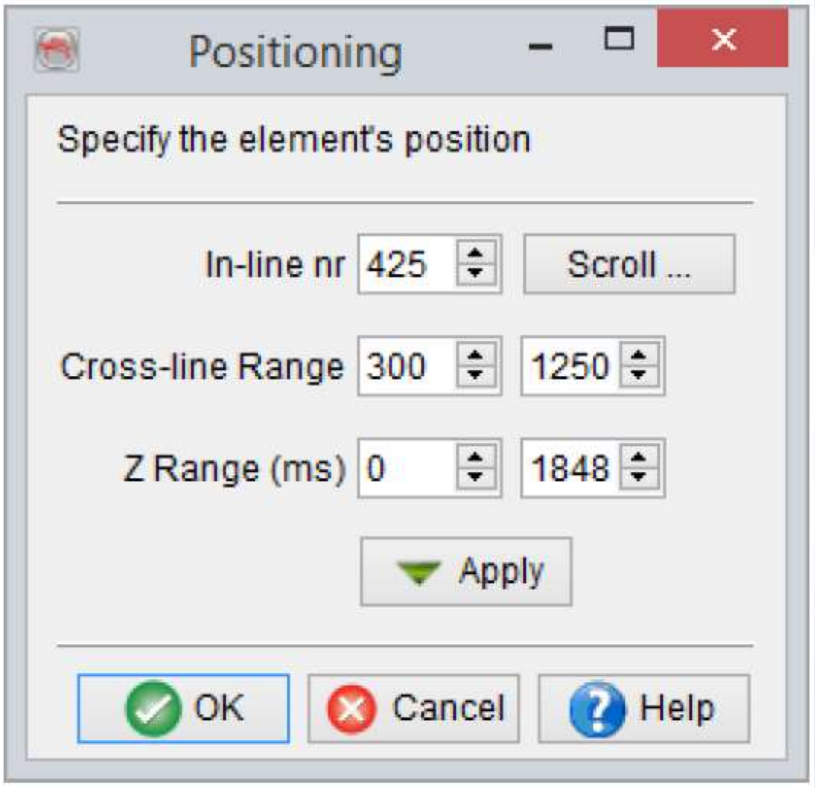

## Display

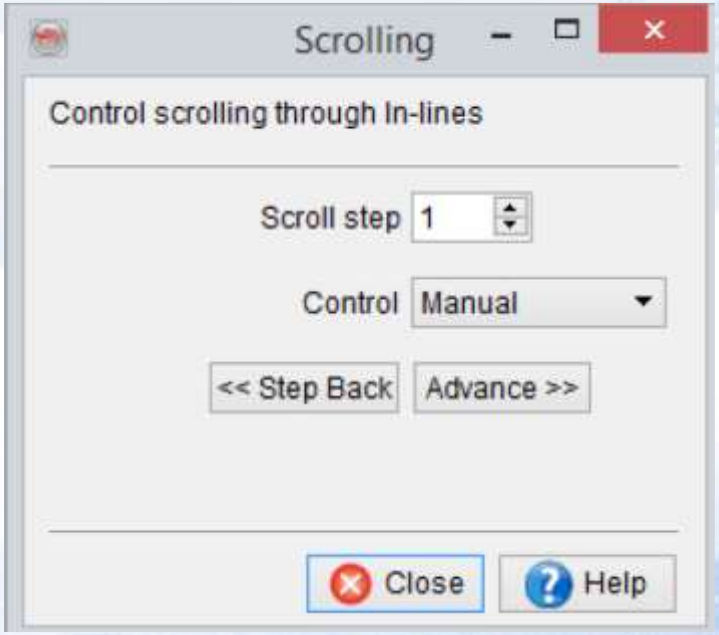
*Histograms:* The histograms of all added attributes of an element can be displayed using the right-click option of the parent element (inline number, surface name...). It is a useful tool to clip the ranges of an attribute by using vertical green lines in the histogram: The vertical green lines show the current amplitude range and can be moved left or right using the left mouse-click. The display is updated when the mouse click is released. This is performed independently for each attribute. Please note that this will toggle off the automatic clipping.




调节绿色线，显示地震数据的颜色有相应的变化。

*Positions:* Change an inline/crossline/Z-slice number. This option is used to manipulate (sub-select a range of traces/time) a line or to quickly scroll through the data for visualization.

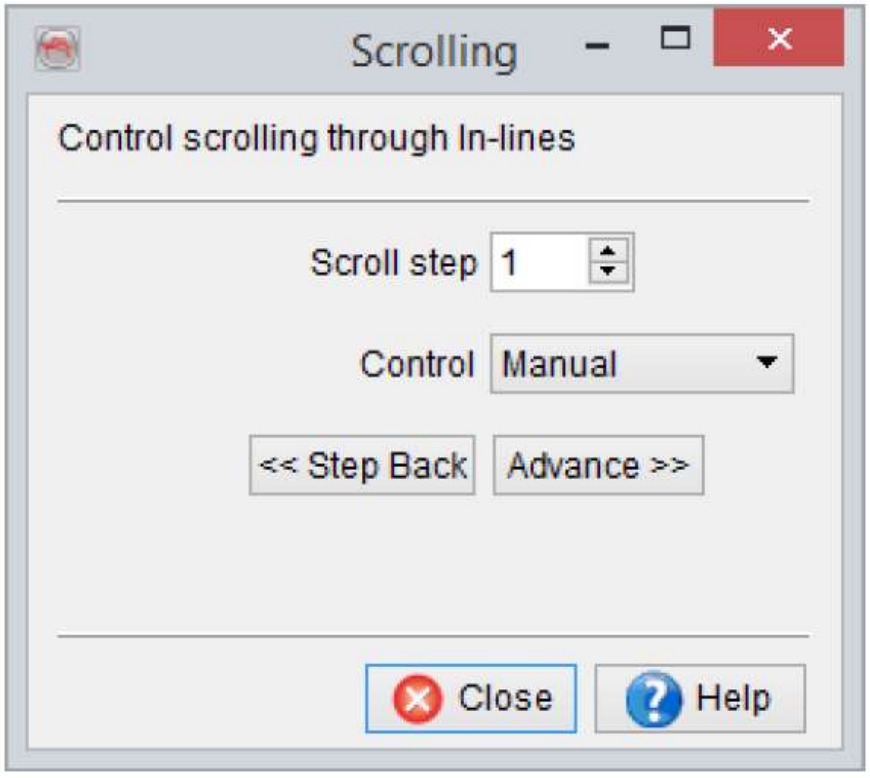


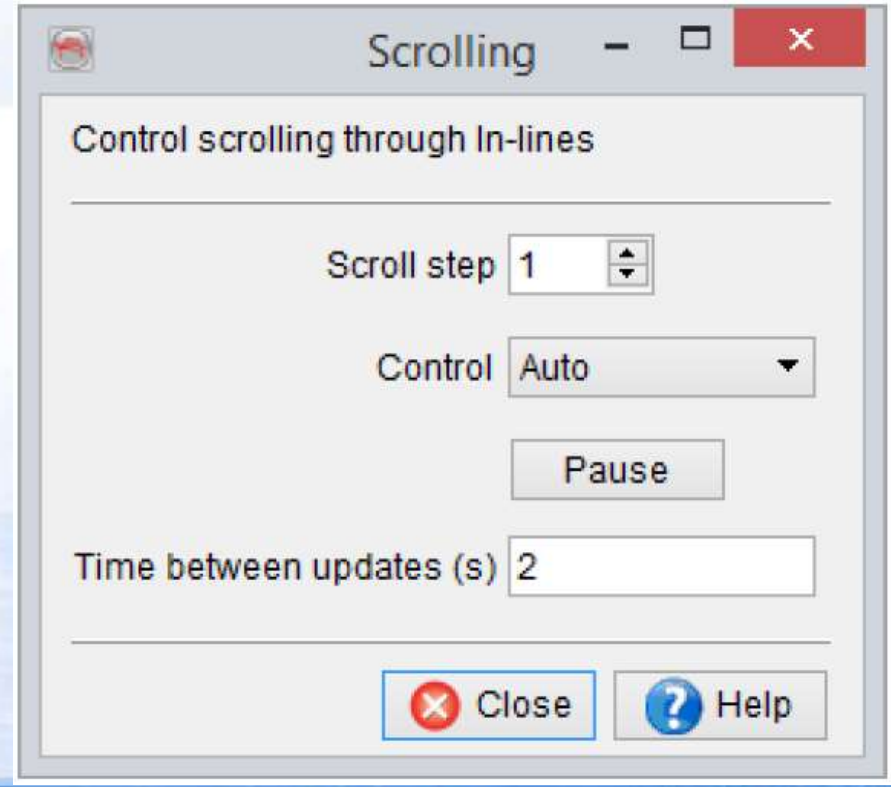




改变Inline/Crossline/Z-slice数。用于提取某段的traces/time的数据体，用于快速可视化地震数据。

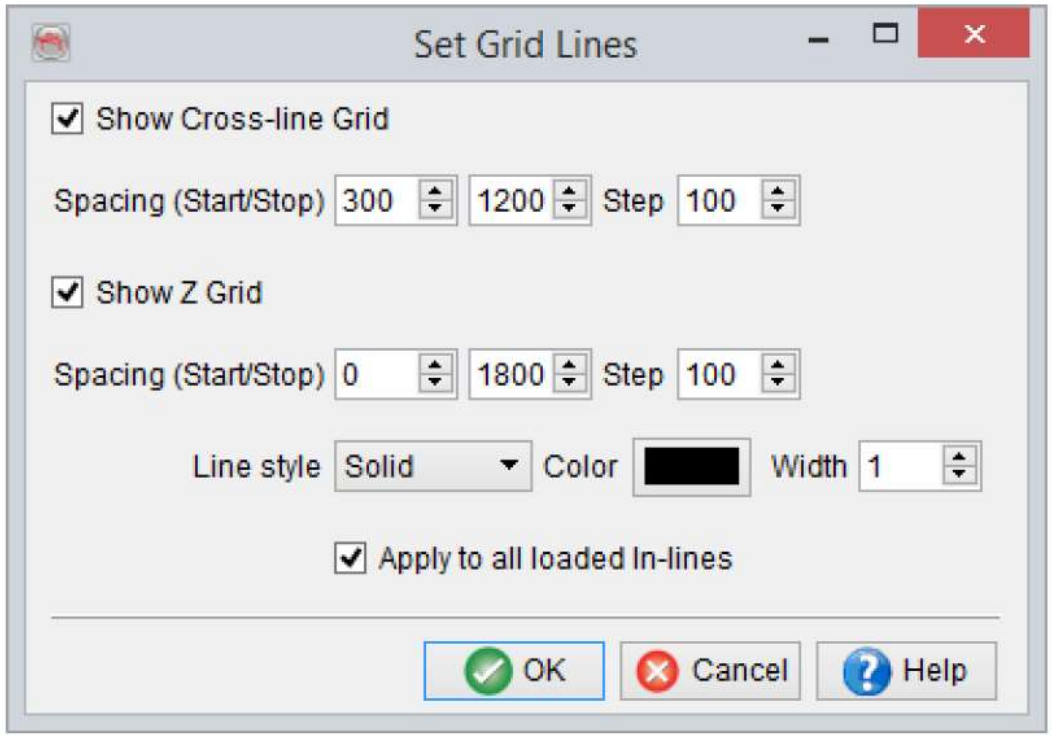
**(L to R) Manipulate or scroll the inline; Manual Scroll and Auto Scroll**

By pressing the Scroll button, elements are moved either manually (select *Control Manual*), or automatically (select *Control Auto*). Scroll in the inline/crossline direction by specifying a fixed *Scroll step*. In the manual mode, the line/Z-slice is stepped to the new position after each subsequent click on the *Advance* button. In the automatic mode, the line/Z-slice is updated in a movie-style with a fixed time interval (in seconds) - *Time between updates*. The auto-scrolling can be paused by pressing the *Pause* button. To resume the auto-scrolling again press *Go* button.



*Gridlines:* Enables displaying grid lines on the particular element. A new menu appears where the grid line spacing, style, color and width can be set.

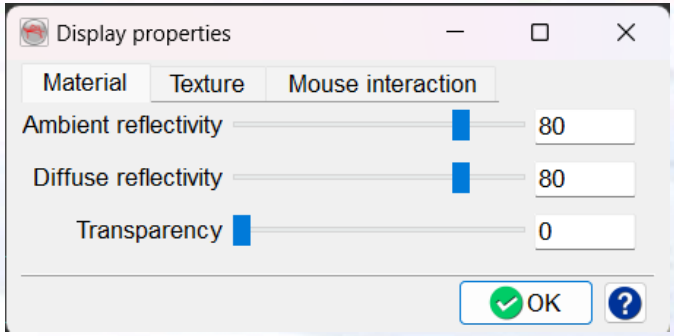



设置地震剖面上的网格线。

*Resolution:* Edit the graphical resolution of the element. The Default does not involve any rescaling before the data is sent to the graphic card. The options Moderate and High do some pre-interpolation before the data is sent to the graphic card and generally results in a cleaner picture. If the memory of your graphic card does not allow high resolution, the element becomes black.

If Shading is on, the resolution option is not available anymore(except for the horizon element).

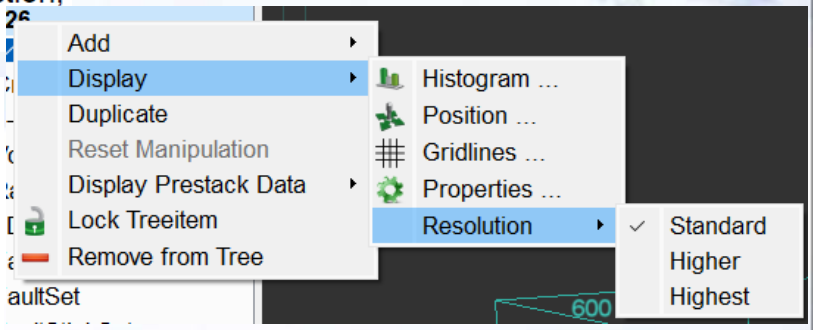
*Properties:* Access display parameters; Transparency, Ambience/diffuse relflection, texture and mouse movement (scroll and pan settings).




**Duplicate:** Add a new duplicate/copy of a selected element in the tree.

**Reset Manipulation:** Reset changes made in the position of the line/Z-slice. Restore the original configuration.

**Display PS Gather:** Pop-up a prestack viewer perpendicular to the inline or cross-line.



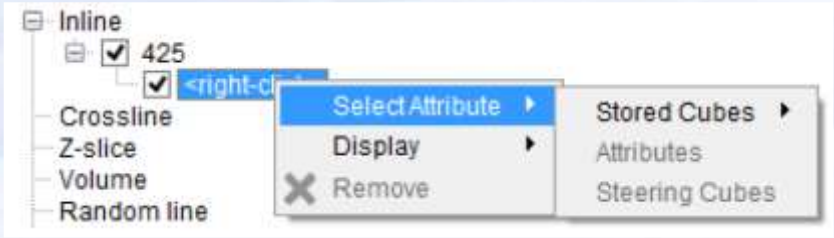

**Note:** It is also possible to display the offset of each CDP gather similarly to any poststack data. The prestack data is available in the list of stored cubes and is marked with quotes { }, at the end of the list.

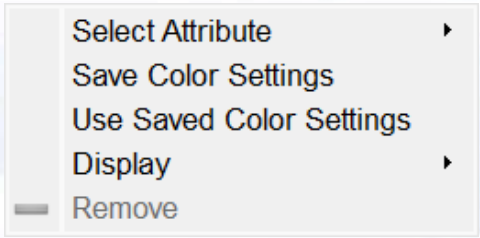
**Correlate with wells:** This will correlate the line with 2D well 没有

**Lock:** Lock the selected object. Prevents accidental removing, moving or displaying data on the object. After clicking Unlock, all editing is again enabled.

**Remove:** This removes the element from the OpendTect tree and the graphics area.

属性的弹出菜单列表选项，如下简述：



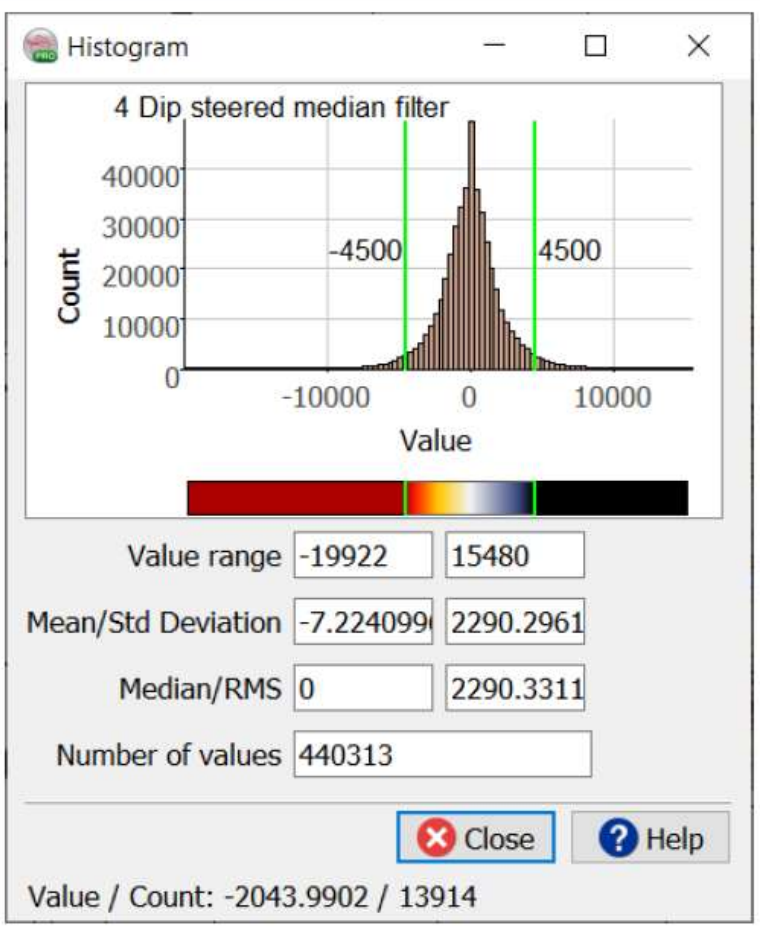

上面已经展示了上述功能。

下面展示Display的几个功能。

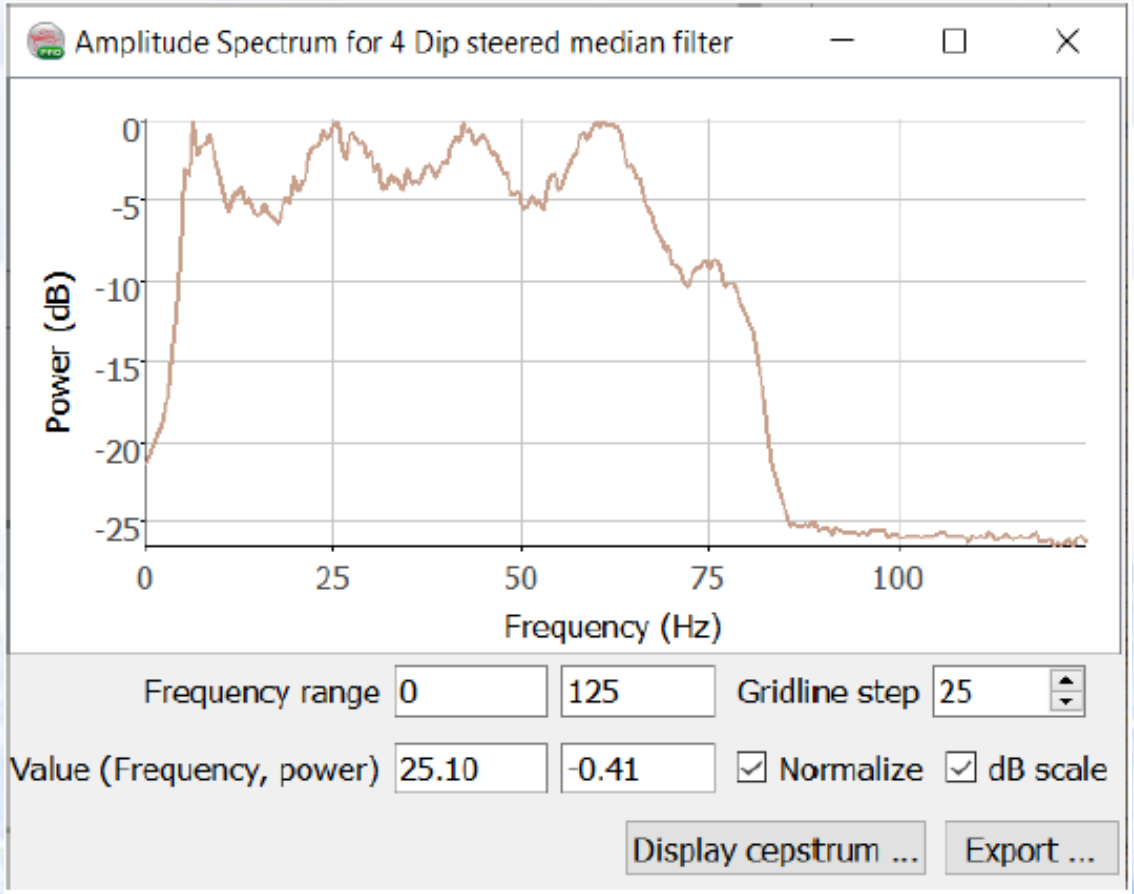

Display

## Display

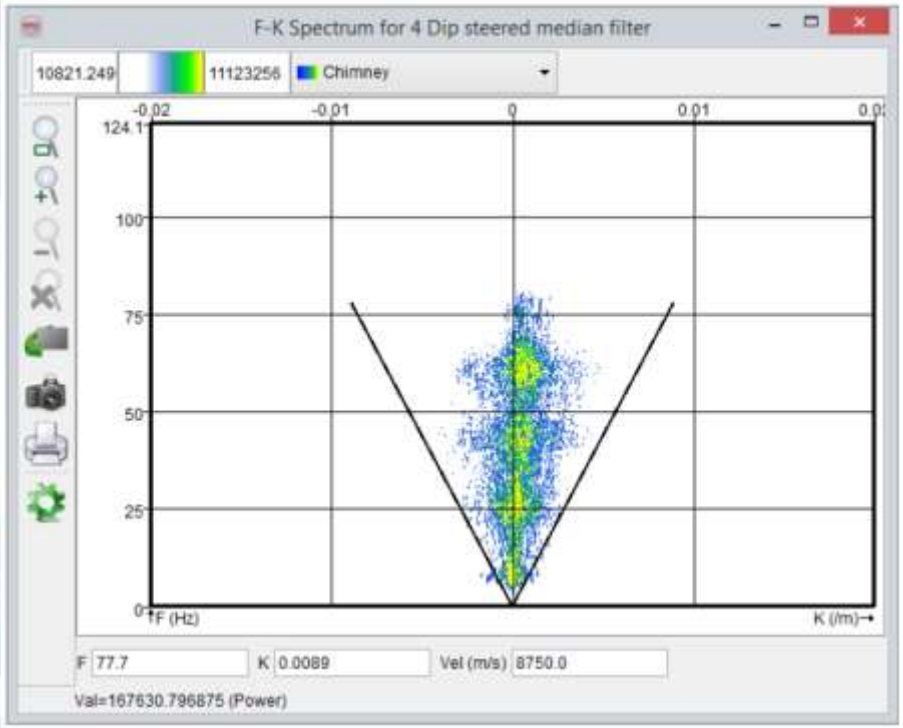
*Show Histogram:* Display data statistics (selected attribute) of the defined volume as a histogram in a pop up window.



*Show Amplitude Spectrum:* Amplitude vs frequency plot will be shown in pop up window. Moving the mouse over the spectrum displays the Values.

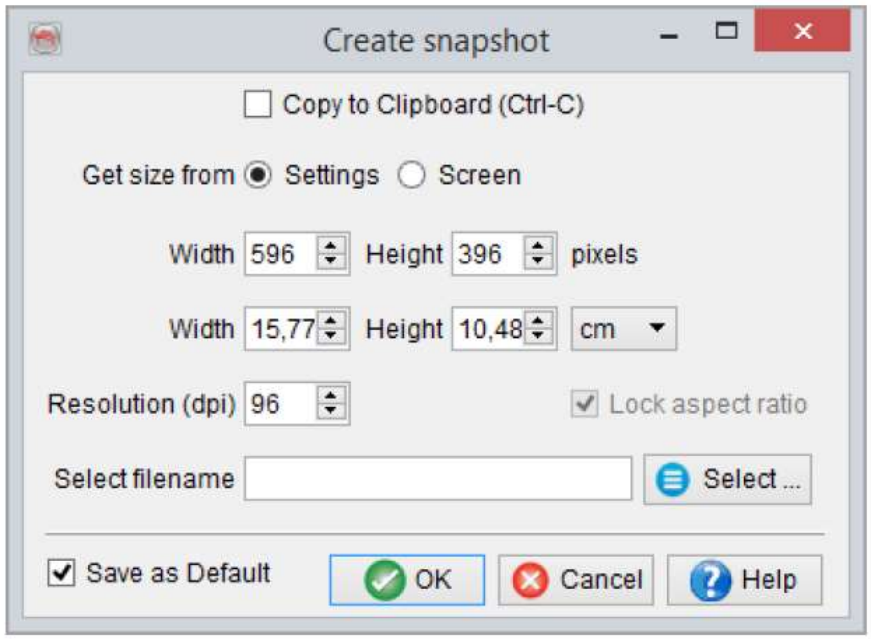


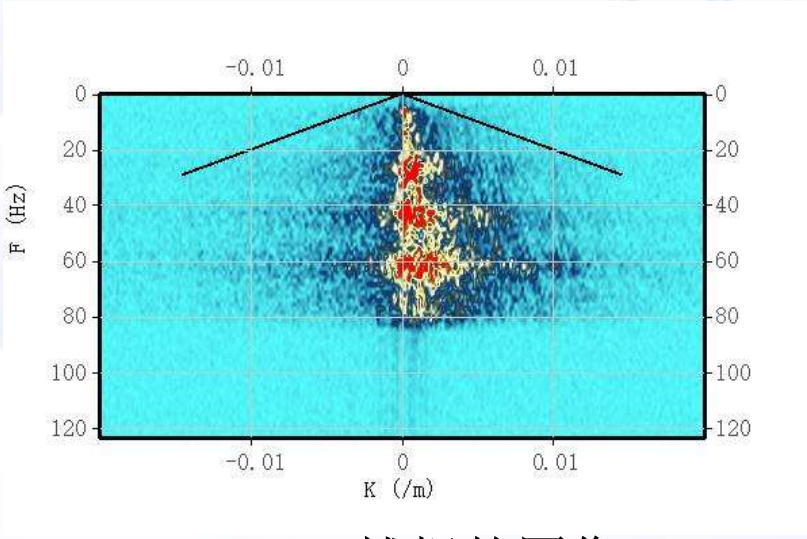
Show F-K Spectrum: A two-dimensional Fourier transform over time and space where F is the frequency (Fourier transform over time) and K refers to wave-number (Fourier transform over space).




时间或空间域上的2维傅里叶转换，F是频率（时间域的转换）），K是波数（空间域的转换）。

Pressing *Ctrl+P* in either the Histogram, Amplitude- or F-K Spectrum windows pops up a settings window where you may define parameters for a snapshot:




Ctrl+P捕捉的图像

捕捉频率直方图和F-K谱窗口照相的图像参数

- *Change transparency:* Change the transparency of the attribute item to view one or more overlaying attributes simultaneously.
- *2D Viewer - VD / Wiggles:* Display an attribute in the 2D viewer as "Wiggle" or "VD" (Variable Density). For more details, please refer to: 2D viewer

**Remove:** Removes the attribute item from the tree.

# 3.3 Volume

Volume

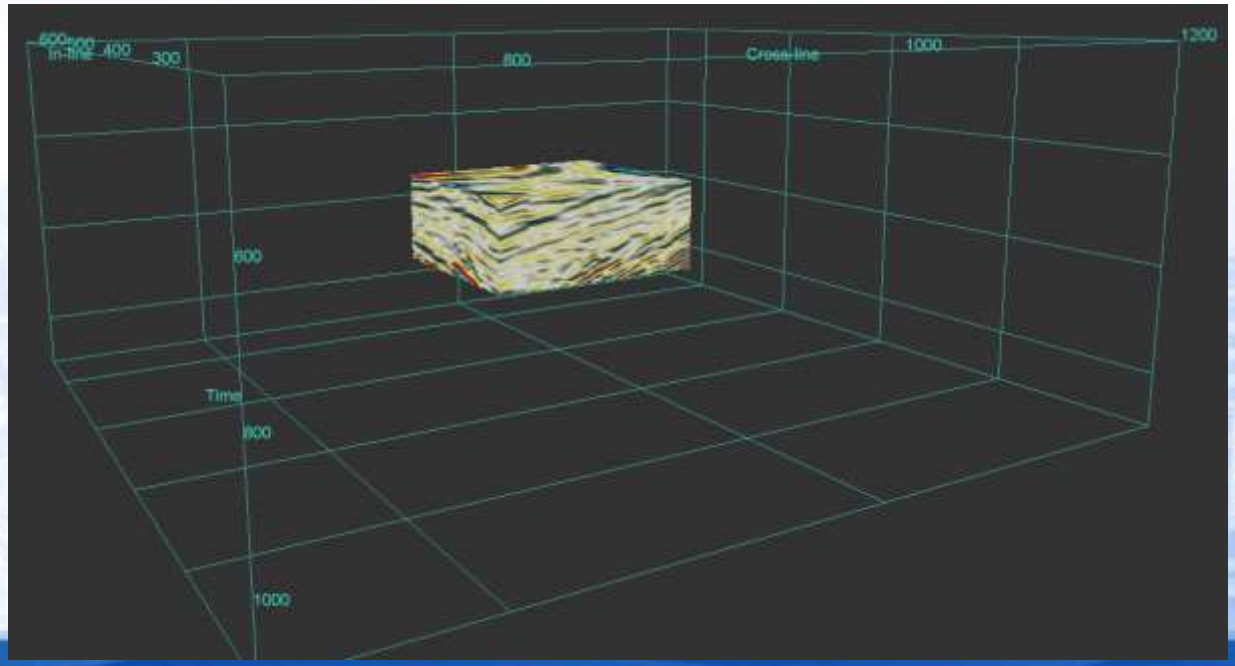
Add

Select Attribute

A volume can be added by clicking on *Volume* element in the tree and selecting *Add* option. A small volume box with blank attribute is added to the scene. An attribute in the newly inserted volume can be displayed by right clicking on the volume and selecting the *Select Attribute* option. This works similar to inline/crossline/Zslice.

You can display either the stored volumes or calculate the attribute within the sub-volume. For faster response times, pre-load the data you wish to visualize using this tree element. 为可视化的快速响应，应预加载数据体。

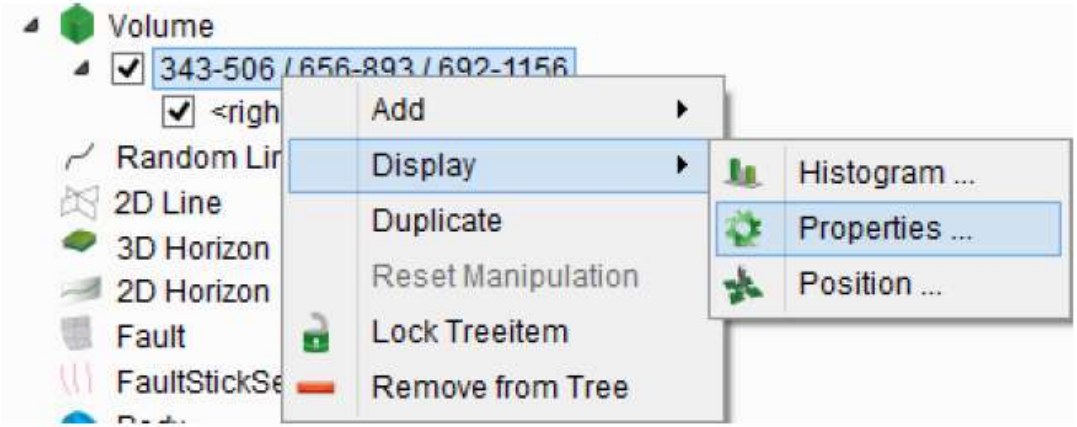
The pop-up menu for the Volume element resembles that described in the previous section for inline/crossline/Z-slice: Volume的弹出菜单，与之间的类似。



**Select Attribute:** Select/change the data in a volume.

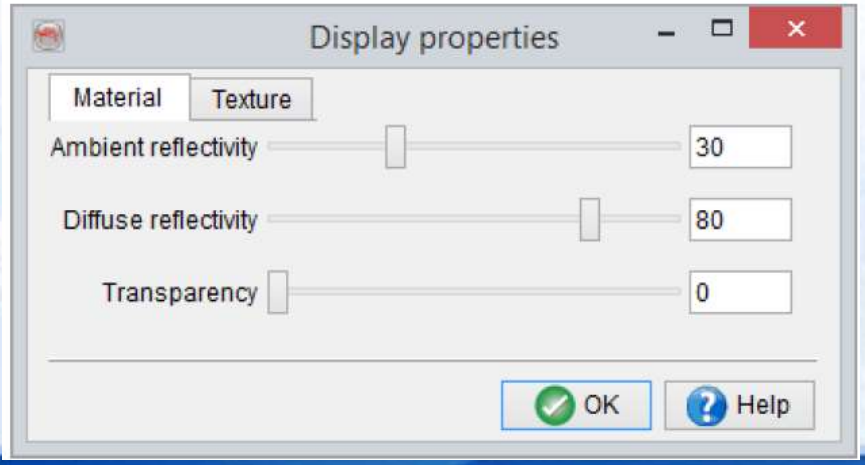
属性选择，与Inline/Crossline/Z-slice类似。

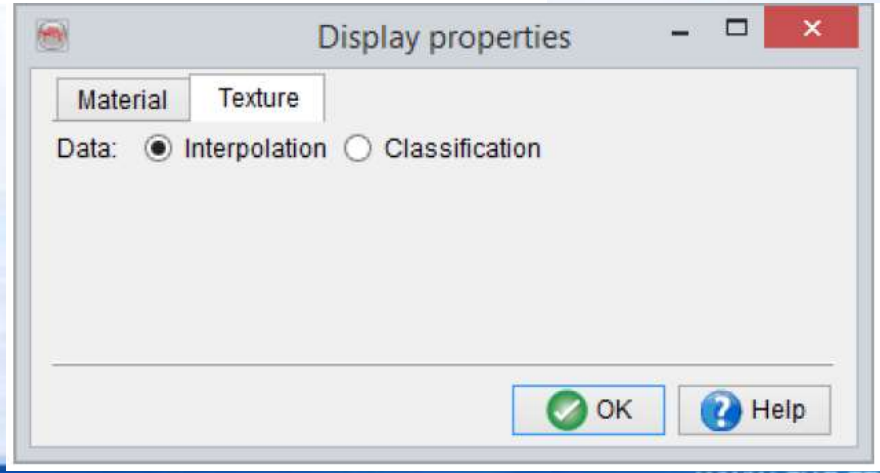
**Display**

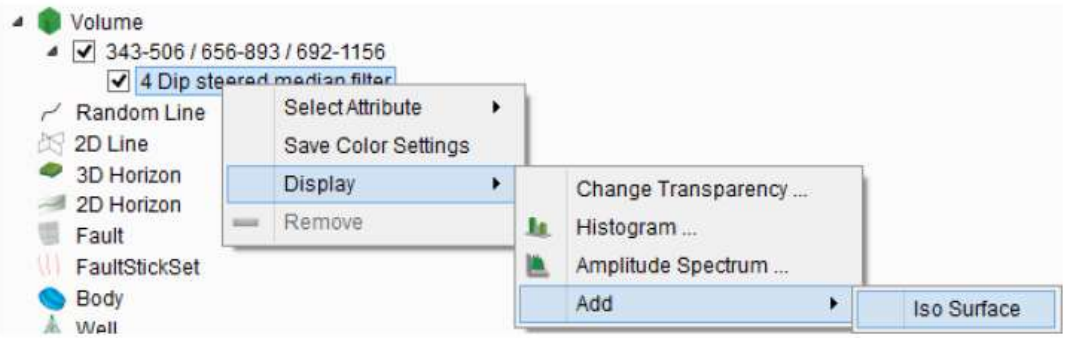



*Properties:* Change display parameters such as transparency and ambiance reflectivity:

显示属性设置

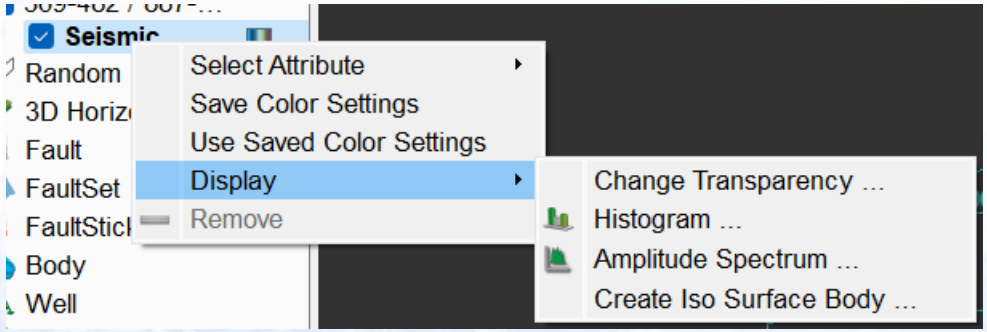





手册截图

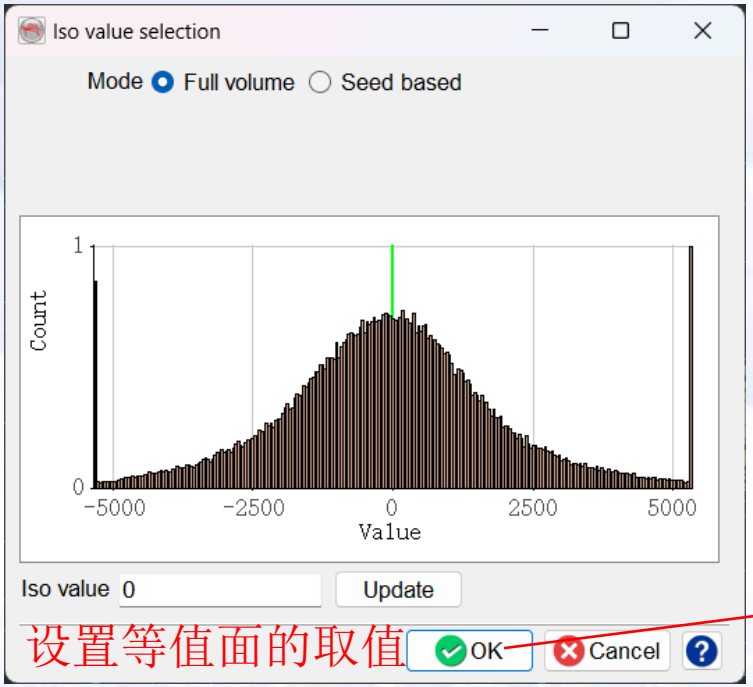
*Add isosurface:* Compute arbitrary iso value surfaces and convert them into bodies.

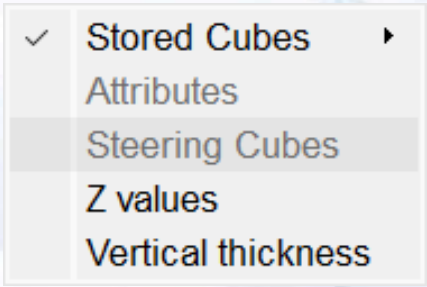



此处有差异。

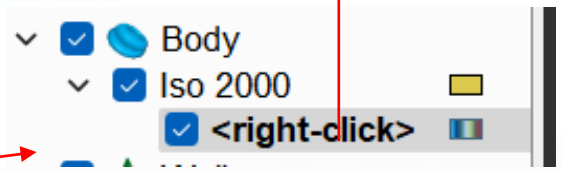
GNU OpendTect6.6的截图

点击Create iso surface Bodu后，弹出下面界面：




在Body中产生




The window displays the histogram of the data collected within the loaded volume (left), or from seeds only that are stored in a pointset (right). "Update" will update the display in the 3D scene (requires some computation time) while leaving the window open. OK will accept the currently selected (or updated) value and dismiss the selection window.

# Volume右击后其他的功能：

- *Amplitude Spectrum:* Pop-up amplitude vs frequency plot.
- *Histogram:* Display data statistics (selected attribute) of defined volume as histogram in pop up window.
- *Position:* Change the inl/xline/Z position within the survey boundaries.
- **Duplicate:** Create a duplicate/copy of the sub-volume.
- **Reset Manipulation:** Reset the changes made in the position of the sub-volume. This option is only available if the user has made any changes.
- **Save color settings:** Save the color settings.
- **Lock:** "Lock" option with lock the selected object, this will prevent accidental removing, moving or displaying of data on the object. After clicking "unlock" editing is enabled again.
- **Remove:** This will removes the element from the display.

与Inline/Crossline/Z-slice的类似。

In Interact mode, (see Mouse Controls) the cursor will return the position (inline, cross-line and X,Y,Z) and the data value at that position in the horizontal status bar of the OpendTect window. 交互模式下，鼠标位置，将返回一些参数，见窗口下方。

# 补充知识

Q is as ratio of stored energy to dispersed energy. It measures a relative energy loss per oscillation cycle. Q increases when the density and the velocity of the material increases. In the Earth's crust and mantle Q ranges from 10 to 1000.