Cropped & Flattened Volumes in *Petrel

Geophysicists who use 3D volumes often want to work on a smaller part of the volume or they want to flatten the volume to a surface to be able to see related areas better (often in areas of faults with large throws).

This TIPS&TRICKS will show how to create “Cropped Volumes” which make sub-sets of a larger volume. This is often done when the area of interest is much smaller than the original volume. Often, a view of the area of interest is obstructed because the rest of the data is in the way. Cropping allows a user to make a volume of the area of interest and not be distracted by the rest of the data.

Also covered here is how to flatten a volume. A flattened version often allows the user to see seismic horizons better in a survey rather than trying to find a horizon on both sides of a fault with a large throw.

Virtual Cropped Volume – Interactive Ranges

Petrel allows the user to insert cropped versions of a volume for various purposes. This is called a Virtual Cropped Volume.

1. Right-click on the original seismic volume and select Insert Virtual Cropped Volume.
2. Press the P hotkey or use the Pick Mode icon to resize the volume via the green handles.
3. If you wish to realize the cropped volume, Right-click on the volume and select Realize.
Virtual Cropped Volume – Discrete Ranges

1. Double click on the new cropped file (crop) and go to the Cropping tab
2. Make adjustments:
   - Inline from, to, skip
   - Crossline from, to, skip
   - Vertical range from, to
3. Click Apply to accept changes to the cropped volume
Creating a Flattened Volume – Insert a Flattened Volume

Petrel versions 2013 and after allow the user to flatten entire volumes. This is a new and very useful addition to the Petrel visualization tools.

1. Double click on a seismic volume and navigate to the Style tab, Volume visualization sub-tab.
2. Toggle on the box next to Volume render, click on OK, and visualize the entire volume in a 3D window. This is the un-flattened volume.
3. Right-click on the name of the volume in the Input pane and select *Insert flattened volume*.
4. The flattened volume appears below the parent volume.
5. Double-click on the flattened volume to open the *settings* dialog.
6. Click on the *Flattening* tab.
7. The main parameter that must be identified is a *Reference surface*. Use the blue arrow button to push a surface (2D Grid) from the Input pane into this field.
8. The *Flatten level* parameter allows you to use the entire surface (default) or enter in a TWT or Z value. If you specify a value here, when the surface has that value, the seismic at the X,Y location will not be flattened.

![Settings for 'Flattened 1'](image)

9. The bottom part of the *Flattening* tab includes an area to insert *horizon interpretations, horizon 2D Grids, fault interpretations, or Multi-Z interpretations*. Use the corresponding button to push them from the Input pane into the *Flattening* tab.
10. When you have parameterized the *Flattening* tab, click on the *Flatten* button. The volume will now be flattened.
11. Flattened interpretation gets a distinctive thick underbar.
12. Visualize the flattened volume in a 3D window. You can display the volume as inlines and crosslines (shown here), or you can display a rendered volume. Remember to use opacity in the settings dialog of the flattened volume to get the full benefit of a rendered volume.