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The Compression Roaming Preview Utility

Paradigm is pleased to offer **Compression Roaming** using *HueStreams* data compression technology to help you manage and work with large volumes of seismic data.

Paradigm Compression Roaming creates a compressed volume which is stored in the Epos database. When the compressed data is accessed from within an Epos application, it is sent in its compressed form across the network to the application, where it is decompressed upon loading.

You can apply a variety of compression levels, depending on how you want to use the data.

- With virtually lossless compression, the data is compressed 3-4 times from its original size. The amplitudes, frequency and phase are virtually identical to the original. The difference is insignificant and the data can be used for detailed quantitative interpretation, just like the original file.

- At higher compression levels, you can achieve a very significant reduction in data size (>10x), and still maintain full 32-bit precision and detailed structural information.

To help you evaluate how the different compression levels will affect your data, Paradigm offers a stand-alone **Compression Roaming Preview** utility – <u>free of charge</u>! Simply point to your SEGY file and use the Viewer to examine the effect of different compression levels on amplitude, phase and frequency. You can also obtain statistics related to the compression level, such as estimated compression ratio (to help you evaluate disk space requirements), PSNR, and error.

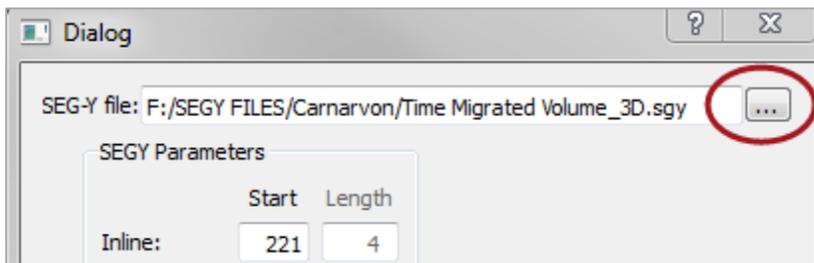*Watch a [short video](#) on how to use this utility.*

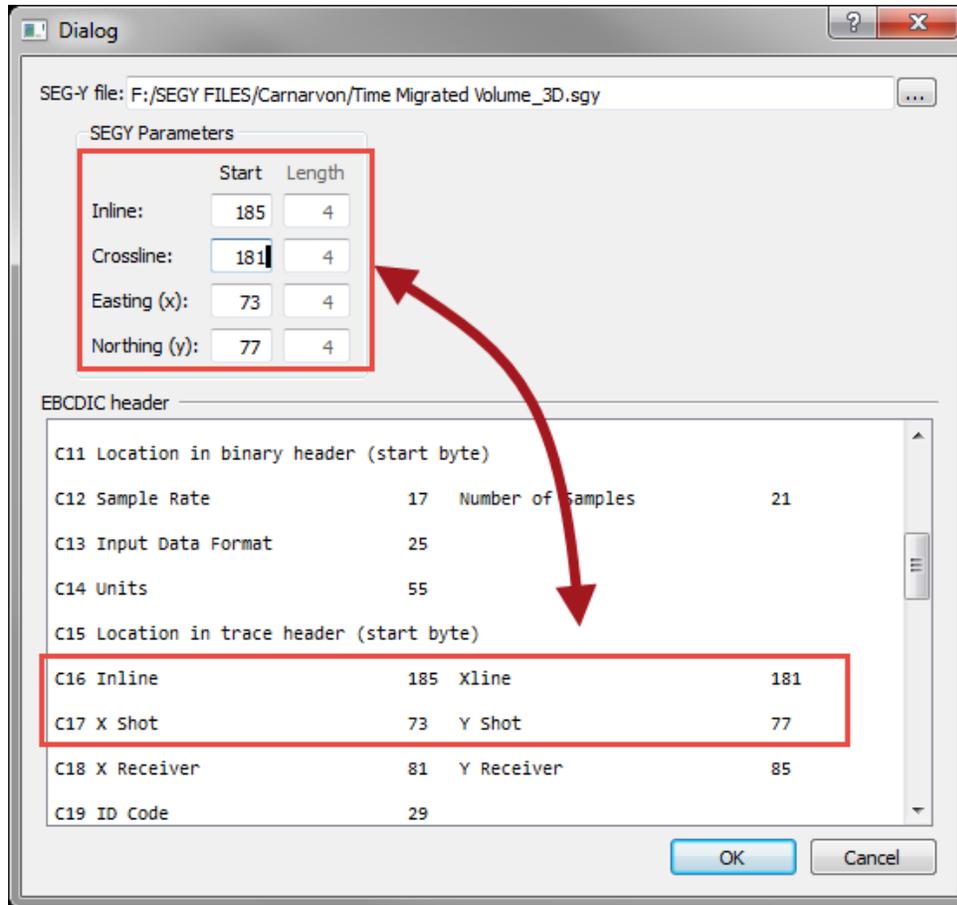---

![Paradigm logo]

Load a SEGY File

1. Click the Load Seismic button.
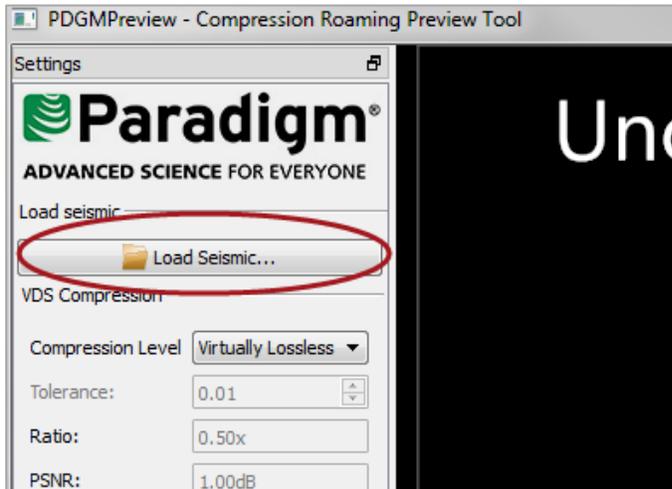
2. Click the Selector button to open a browser and select a SEGY file. It may take a few seconds to propagate the information in the Dialog box.
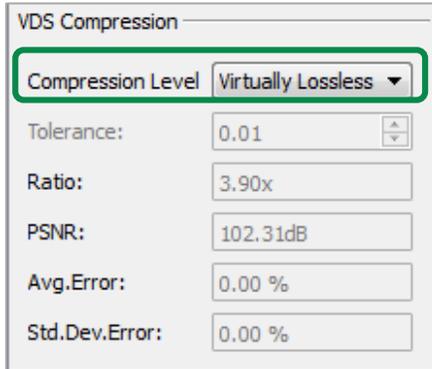

3. Examine the EBCDIC header information for your SEGY file and enter the correct byte positions for the Inline, Crossline, X and Y parameters.

4. Click **OK**. It may take a few seconds for the file to load.

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Select a Compression Level and Examine the Statistics

1. Select a **Compression Level**. Notice the statistics are updated for the selected inline.

```
VDS Compression
Compression Level   Virtually Lossless  ▼
Tolerance:          0.01              ▲▼
Ratio:              3.90x
PSNR:               102.31dB
Avg.Error:          0.00 %
Std.Dev.Error:      0.00 %
```

Understanding Compression Statistics

The statistics are **cumulative** and are calculated based on the current line displayed plus all other lines you scroll to for the selected compression level. To reset the statistics, select a different compression level. The statistics will then be based on that compression level for the displayed line. The statistics will update as you move to additional lines.

- **Tolerance**: This is an internal parameter used to determine the amount of compression. A higher tolerance results in more compression.

- **Ratio**: This is the estimated actual compression ratio for the cumulative set of displayed lines for the selected compression level. This ratio is based on 2D compression. The actual compression performed in the Paradigm Compression Roaming utility is 3D compression. You can use the Ratio in this preview utility to estimate the disk space required for the full compression.

  Notice that the compression ratio increases for lines with a high concentration of null traces.

- **PSNR**: This is the estimated Peak Signal to Noise Ratio for the cumulative set of displayed lines for the selected compression level. Use this to get an idea of how the different compression levels affect the signal to noise ratio for your data.

- **Avg.Error**: This is the average difference between the compressed vs. original amplitudes for the selected data (cumulative display).

- **Std.Dev.Error**: This is the difference in the spread of values in the compressed vs. original amplitudes for the selected data (cumulative display).

  The error statistics provided in the Preview Utility are calculated in 2D, and can be used as estimates for the 3D compression. Generally, the results are better when applied in 3D, since the compression can take advantage of the 3D correlations.

Using the Viewer

1. In the Viewer, notice the vertical Divider in blue. On the left is the original data and on the right is the compressed data. Move the divider across a feature of interest to see how the compression affects the signal.
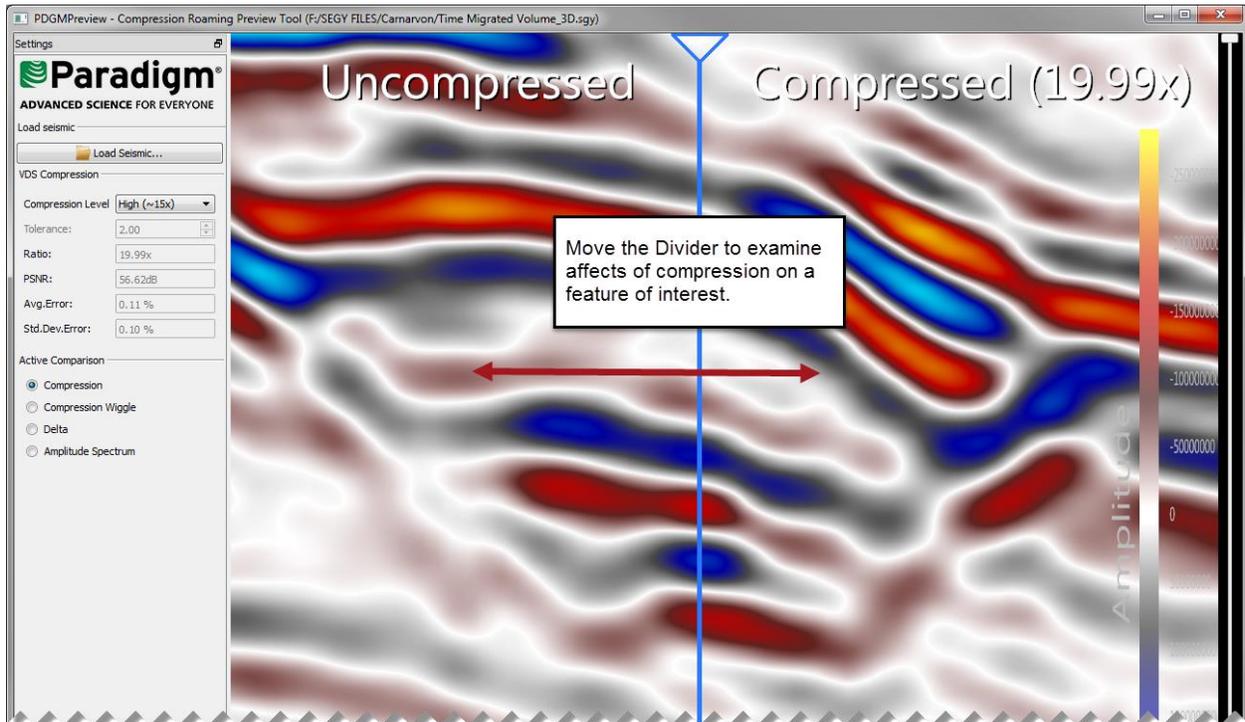
2. Use the slider bar at the base of the Viewer to move to another line. Notice that the statistics change, since they are a cumulative calculation based on all the data you display for that compression level.
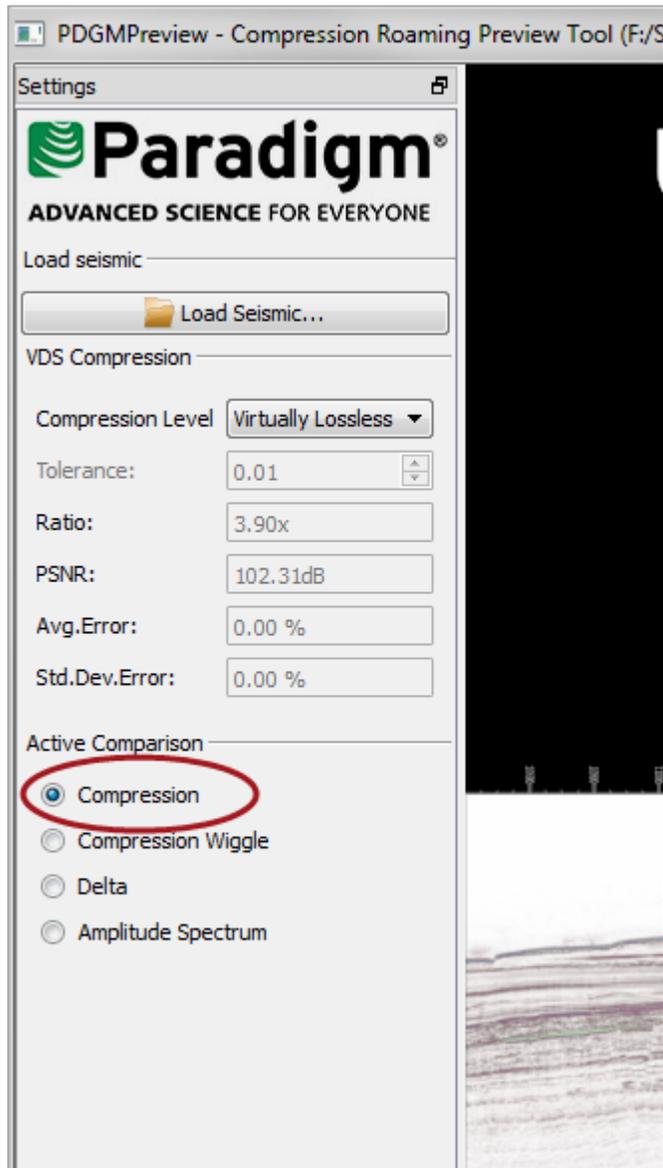

- *Use the mouse roller wheel to zoom in to the display.*

- *Use Control + [Page Up/Page Down] to change the aspect ratio.*

- *Press "3" to return to the "Home" display (default zoom on the inline).*

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Understanding the Active Comparison Modes

Compression

1. Toggle the **Compression** option for Active Compression.

2. Move the **Divider** across a feature of interest to see how different compression levels affect the data.

Compression Wiggle

1. Select **Compression Wiggle** for the Active Comparison mode.

Active Comparison
- ○ Compression
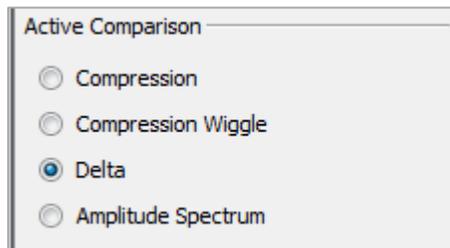- ● Compression Wiggle
- ○ Delta
- ○ Amplitude Spectrum

2. Use the mouse roller wheel to **zoom** in to examine the traces.
3. Move the **Divider** across a feature of interest to see how the compression affects the wiggle traces.

Notice that if you zoom in significantly, you can examine the effect of the compression on the phase.
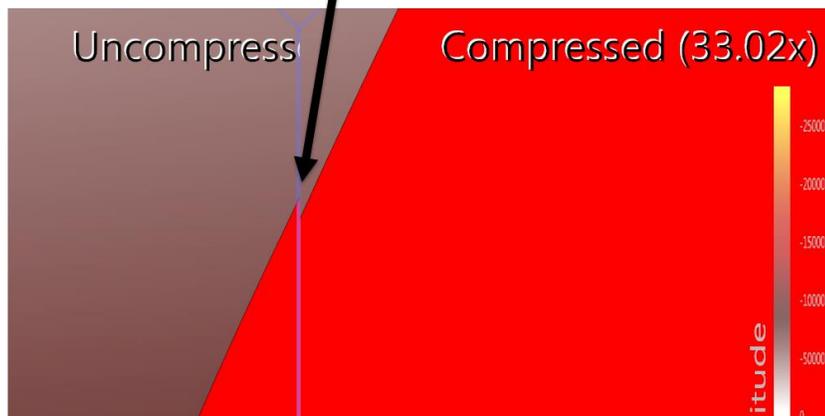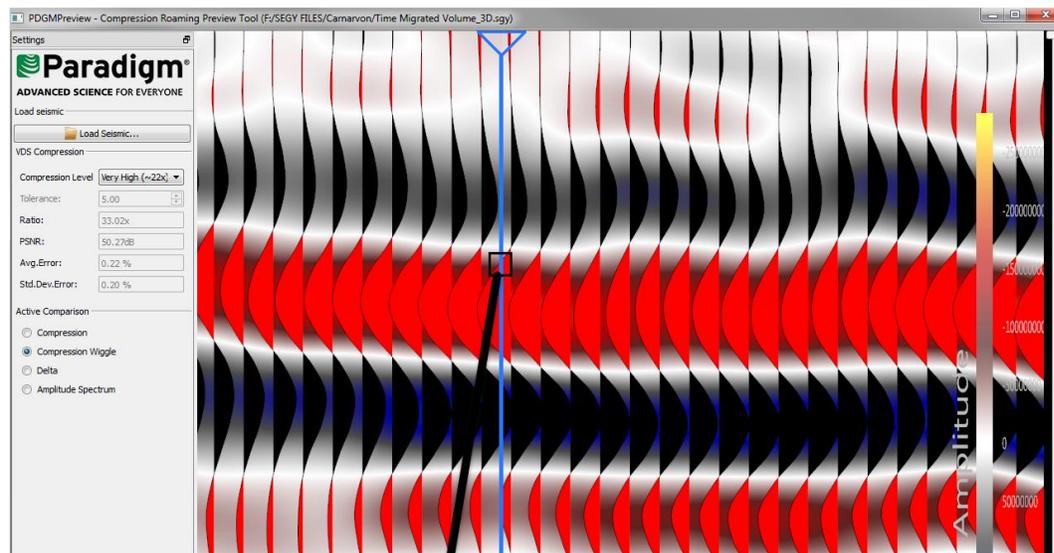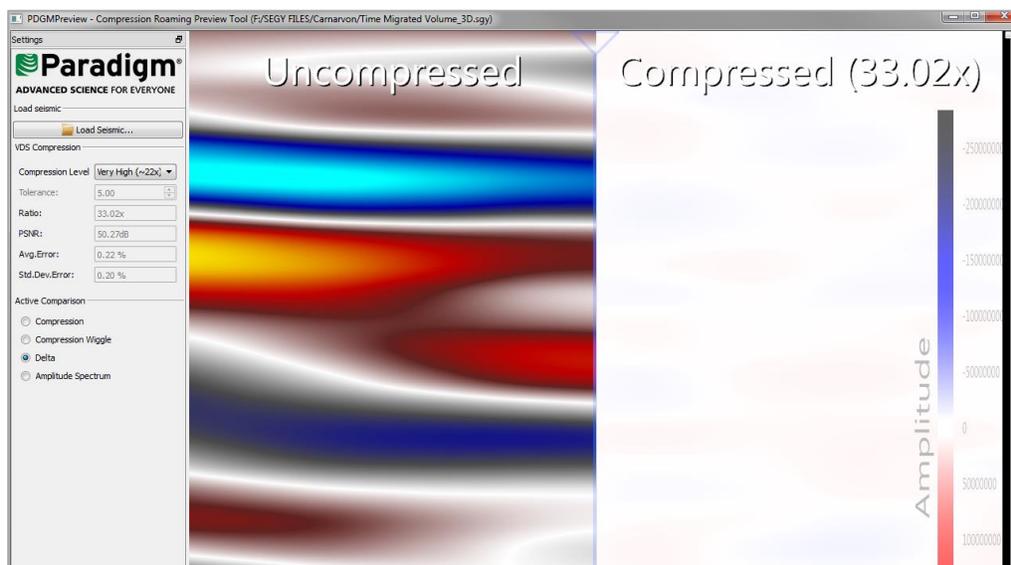
Delta

1. Select **Delta** for the Active Comparison Mode.

2. Zoom in to a feature of interest.
3. Move the Divider across the feature to see the data that is removed during compression.

Use the Delta Active Comparison mode to confirm that the selected compression level is removing only noise and not structure associated with the target feature.

Amplitude Spectrum

1. Select **Amplitude Spectrum** for the Active Comparison Mode.
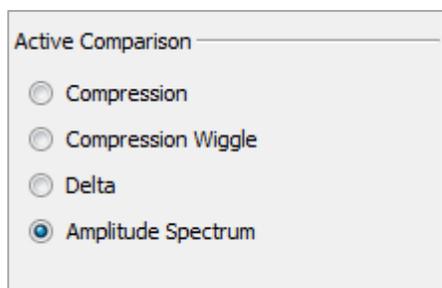
2. Drag the vertical slider bar on the right of the viewer to "blow up" the display.

The Amplitude Spectrum Comparison Mode

The amplitude spectrum shows the amplitudes converted to level of energy at different HZ (frequency on the vertical axis). The amplitude spectrum can be used to identify the noise introduced (or removed) seen on the delta option, and how it manifests itself at different frequencies in the dataset.

With high compression, and blowing up the display of the signal 100x (by setting the bar to the right at the screen to 1%), you should see noise manifest itself at 75-100HZ on short band seismic.