Joint Deghost & Designature Test

NZ 3D Processing

11 November 2020

INSTITUTE FOR GEOPHYSICS

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cgg.com

Processing flow

1. Convert to CGG internal format
2. Nav merge / trace edit
3. Low cut filter
4. Time Variant Scaling (TVS) & Resample to 4ms
5. Swell noise attenuation (SNA)
6. Debubble
7. Linear noise attenuation (LNA)
8. Tidal statics correction
9. Water column statics correction
10. Shot & channel scaling
11. Receiver motion correction (RMC)
12. Joint Deghost & Designature

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Outline

- **Objective:**

  To remove source & receiver ghost and process designature concurrently.

- **Procedure:**

  CGG's pre-migration 3D de-ghosting technology - ghost wavefield elimination (GWE) done in sparse Tau - p domain. GWE is able to remove both source and receiver ghost to produce ghost free dataset.

- **Display:**

  Stack, amplitude spectra, selected shot gathers, common channel, filter panel.

- **Observation and Recommendation:**

  Ghosts are removed from input data and primaries are more visible. The notch frequency is compensated and low frequency is recovered. Phase is well aligned after processing. It's recommended for production.

* Wang, P., Ray, S. and Nimsaila, K., 2014, 3D joint deghost and crossline interpolation for marine single-component streamer data: 84th SEG Annual International Meeting, Expanded Abstracts, 3594-3598.

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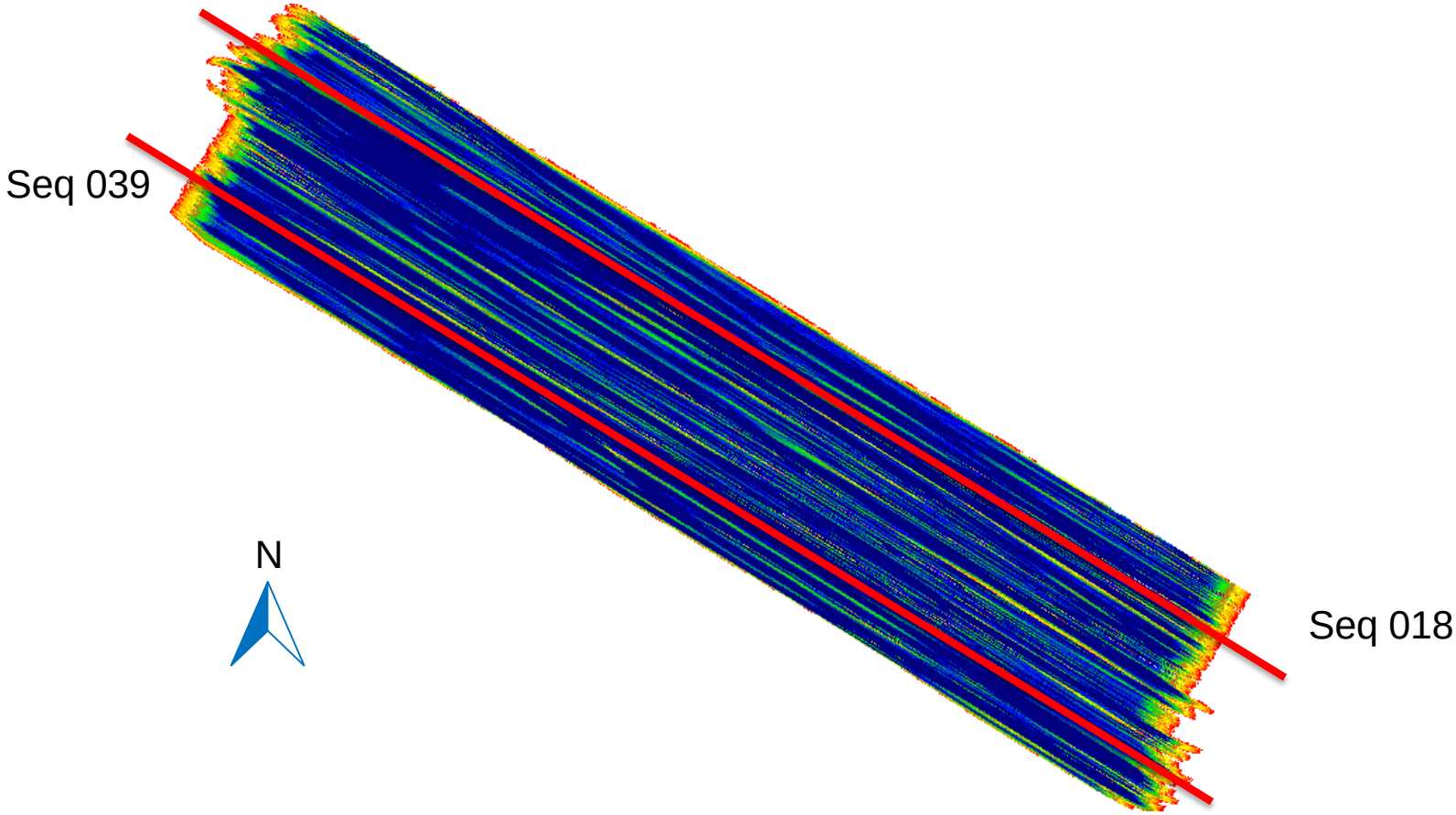
Test Line Location



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Seq 018

Receiver Depth Map
Stack
Shot Gathers
Common Channel
Filter Panel

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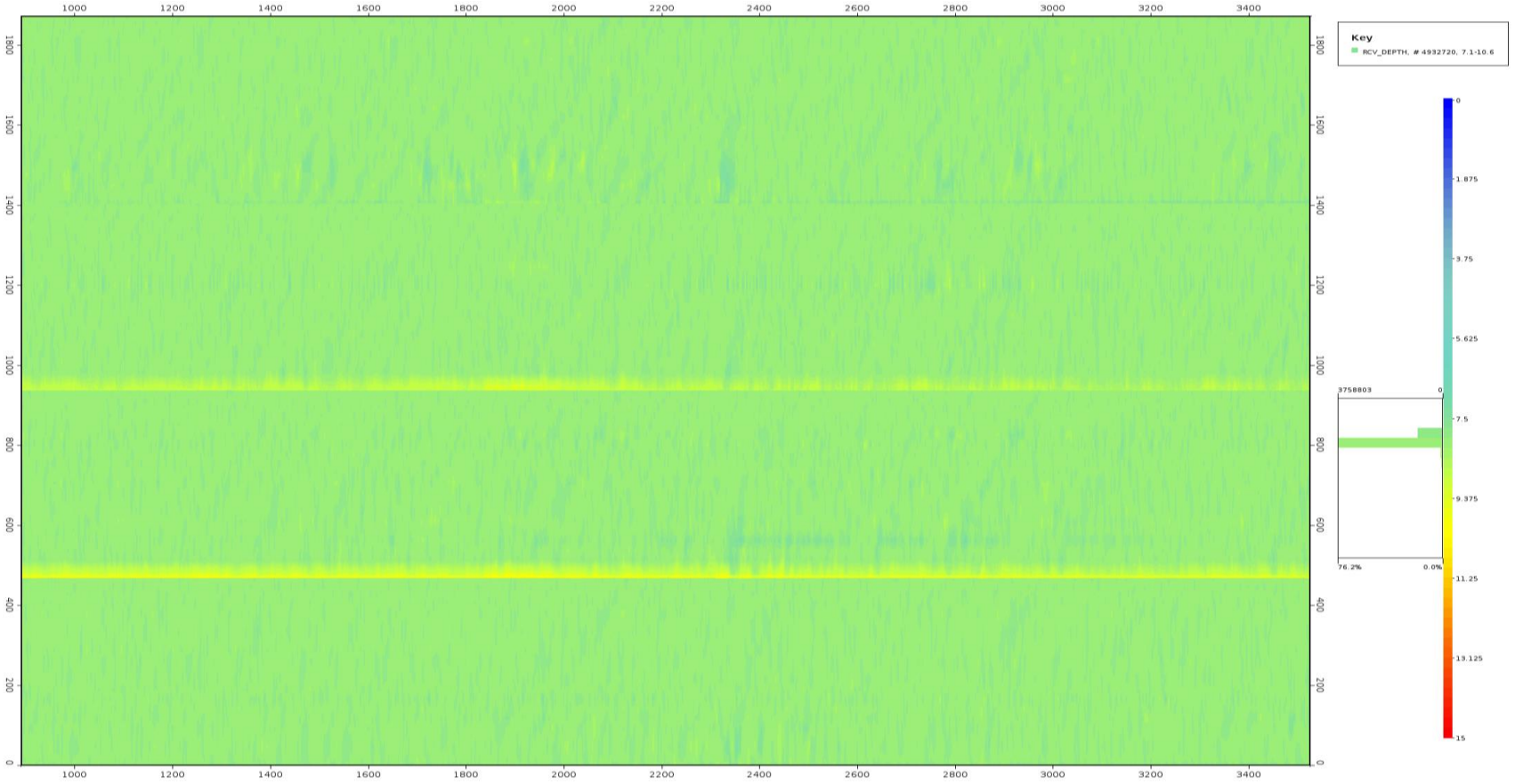
Seq018 Receiver Depth Map



Receiver depths vary 7~9m, so receiver side ghost has a notch frequency around 95Hz.

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Full Stack (0 - 35 deg)

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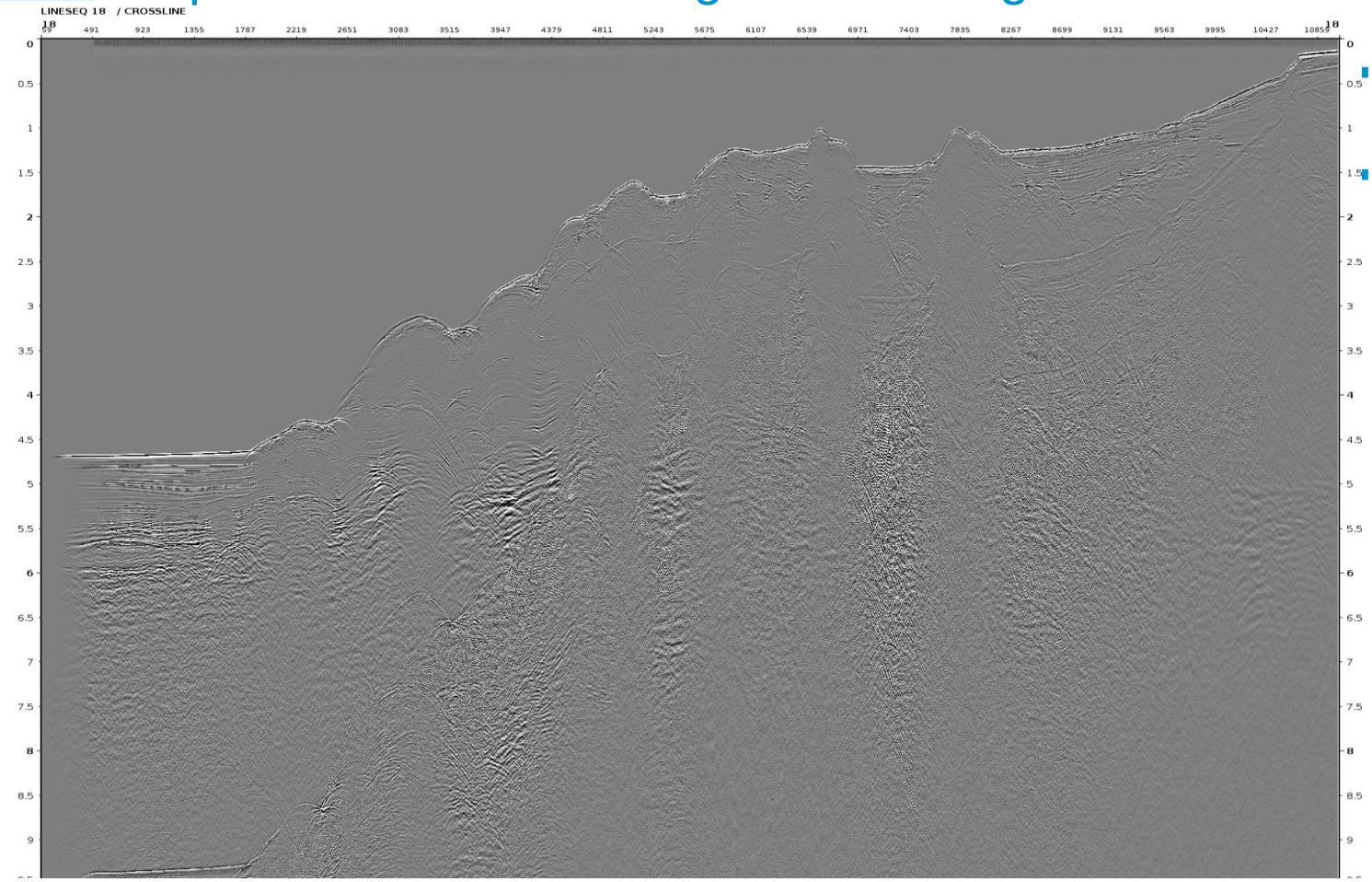
Seq018 Stack before Deghost & Designature



- Ghost effect was removed.
- Primaries are more visible.

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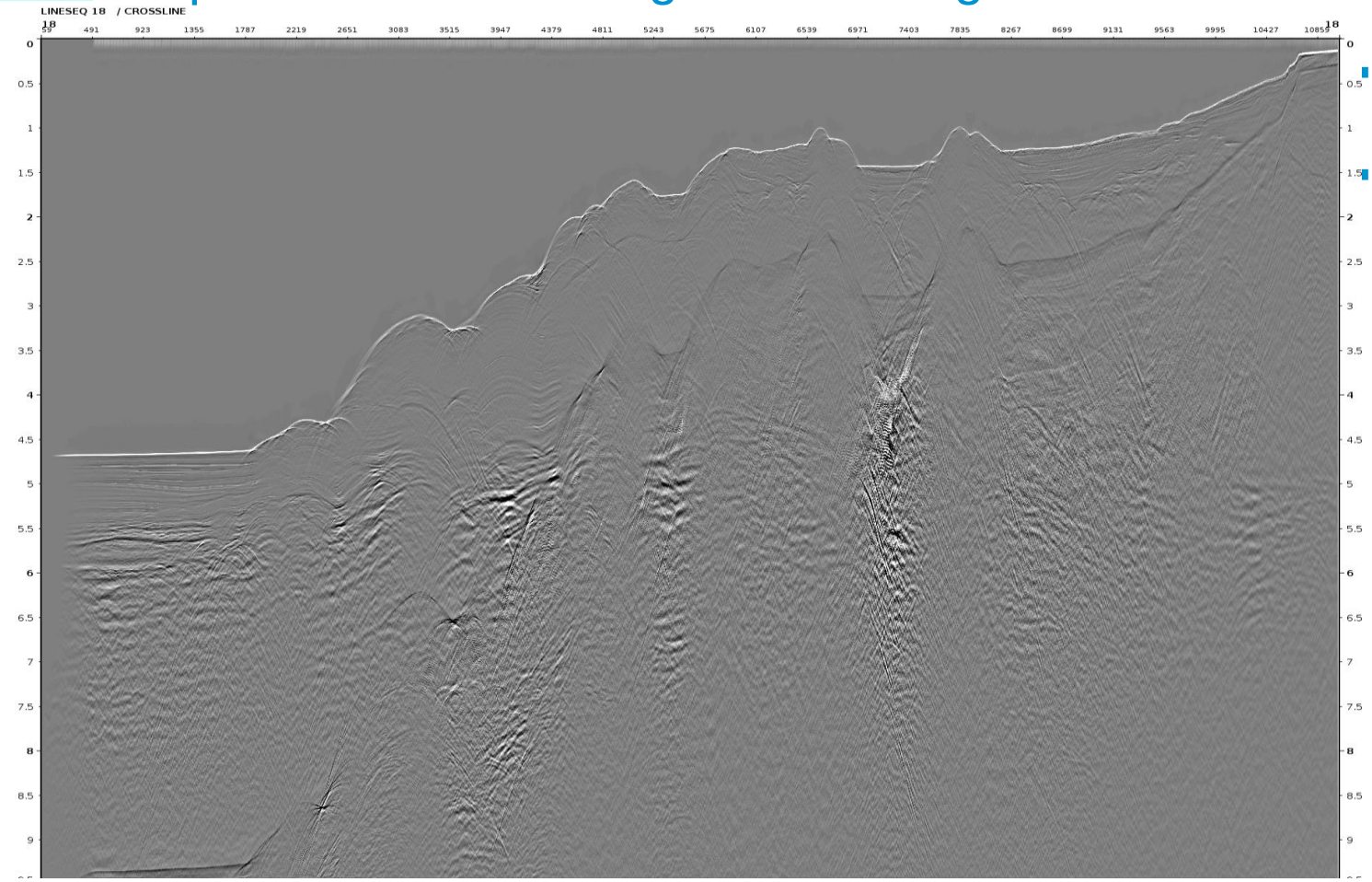
Seq018 Stack after Deghost & Designature



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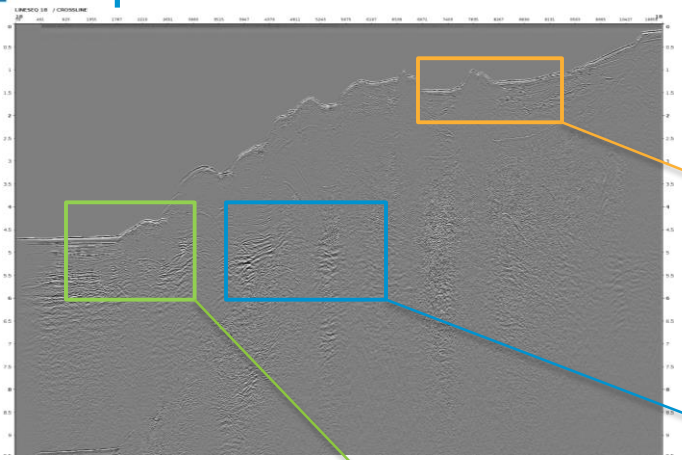
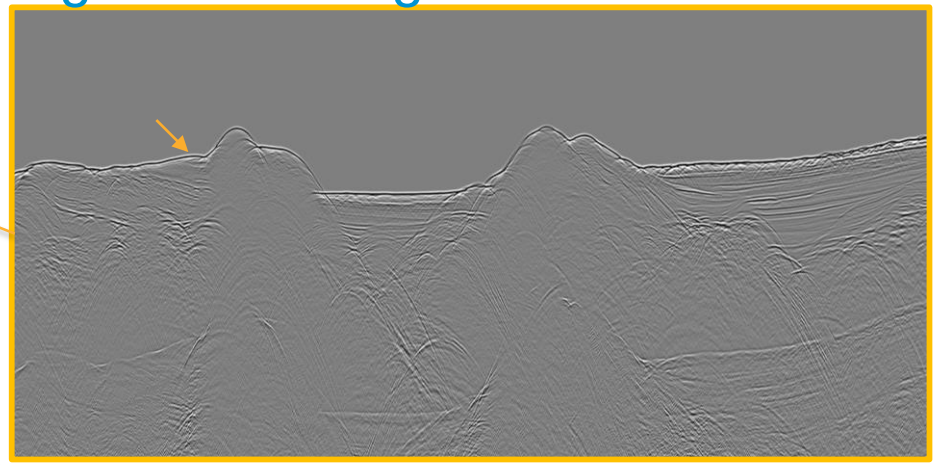
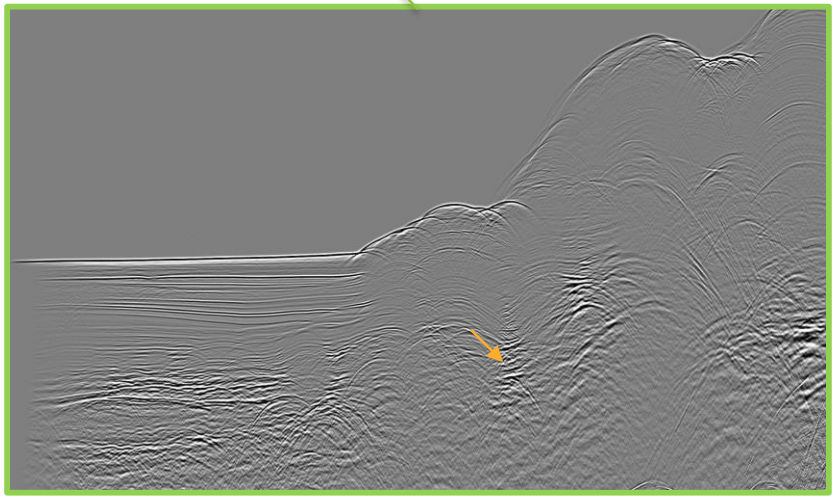
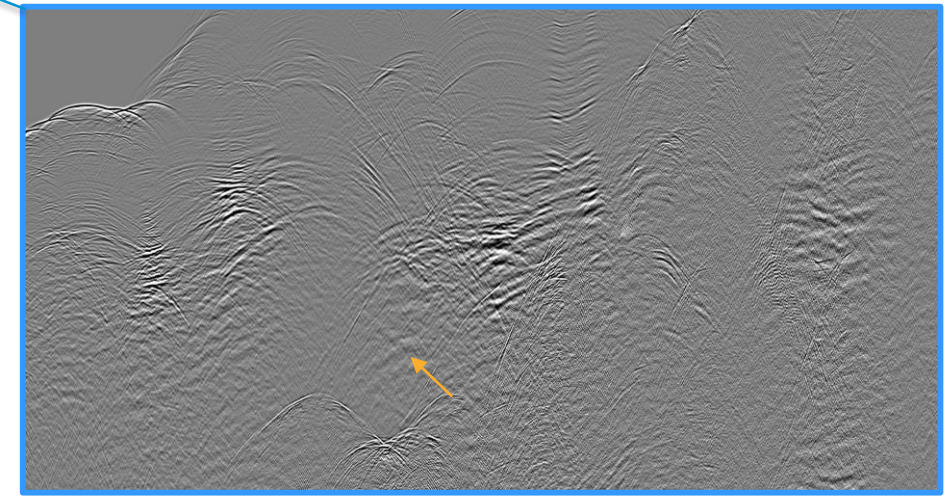
Seq018 Zoom in Stack before Deghost & Designature









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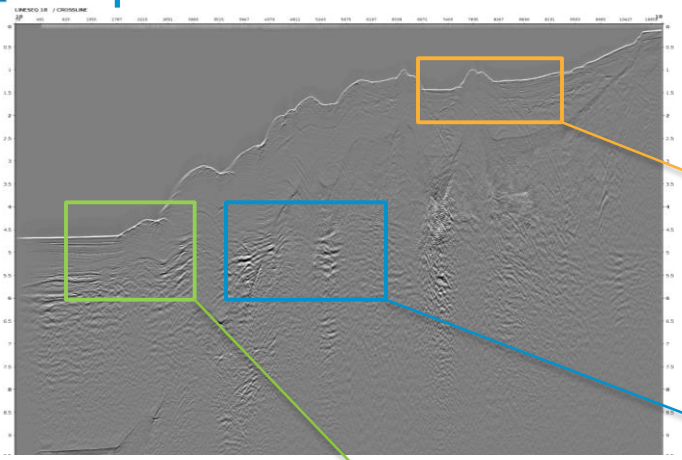
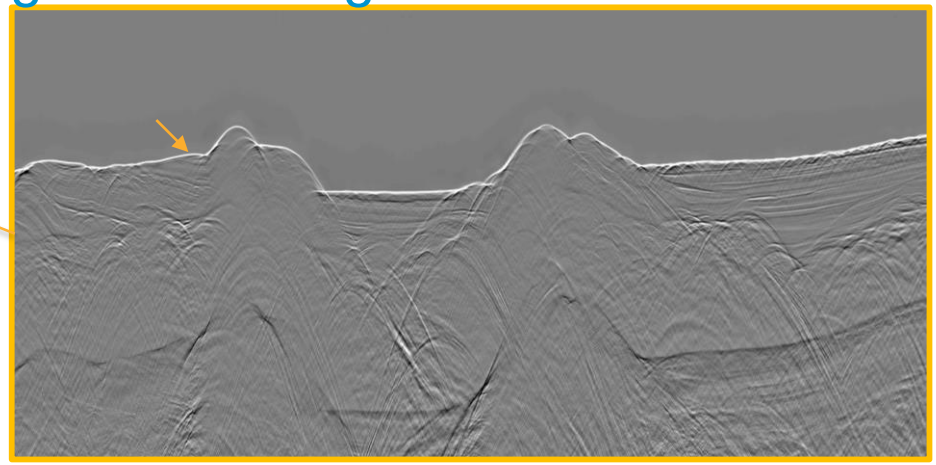
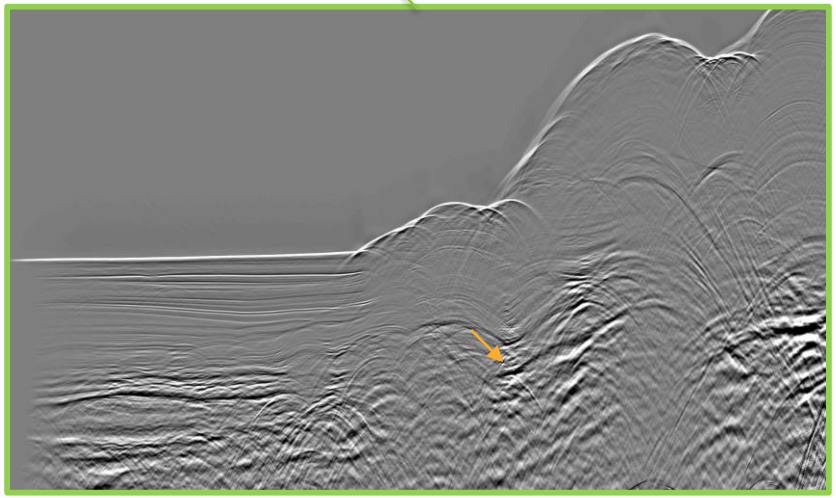
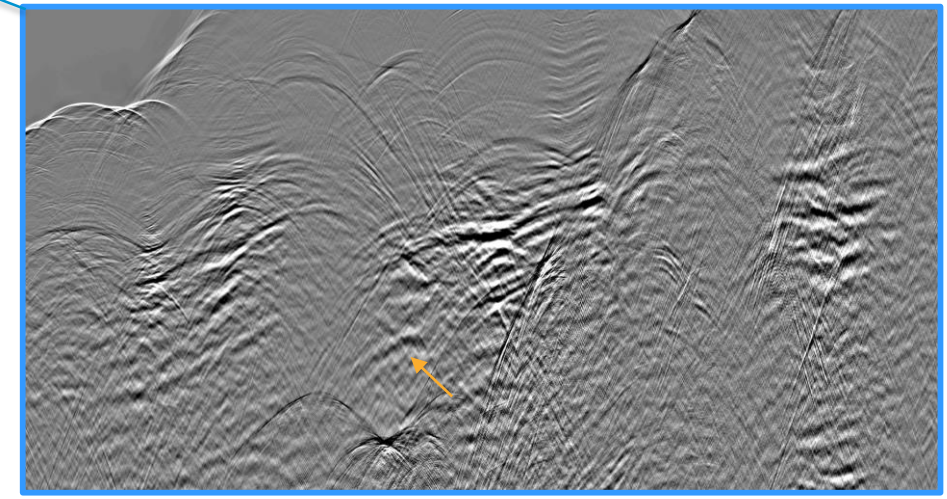
Seq018 Zoom in Stack after Deghost & Designature









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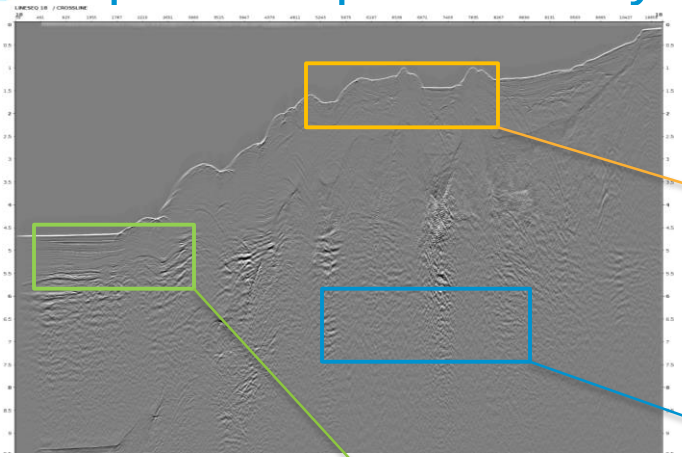
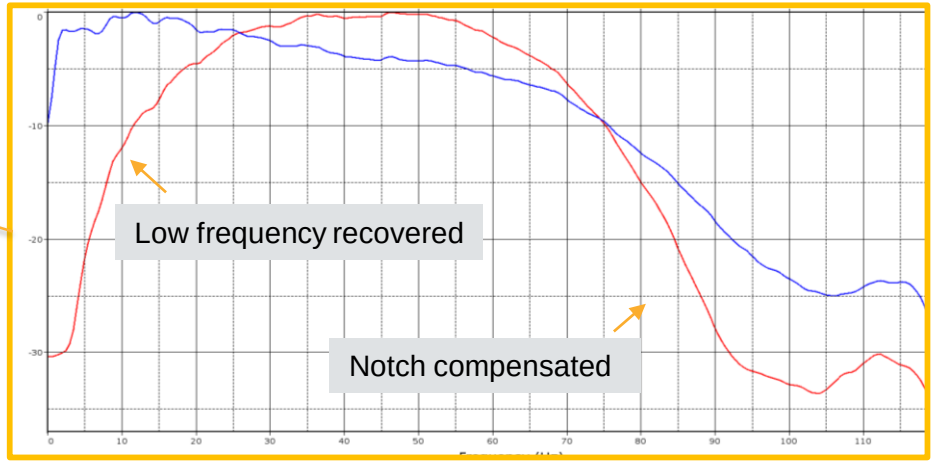
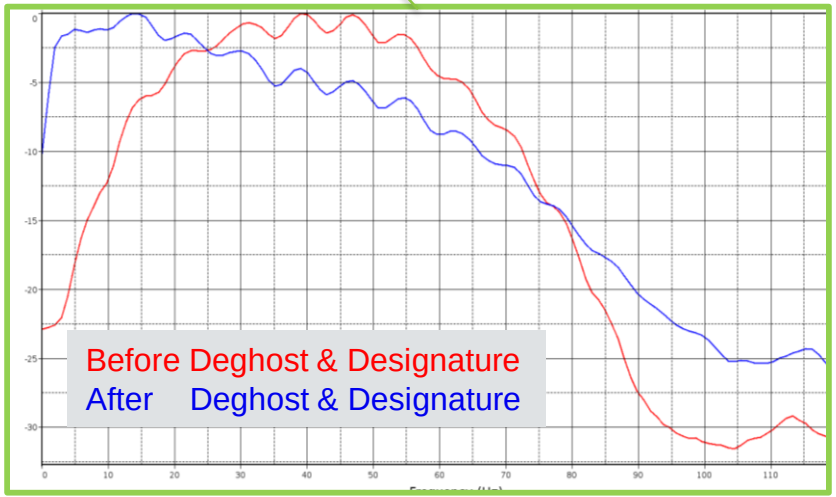
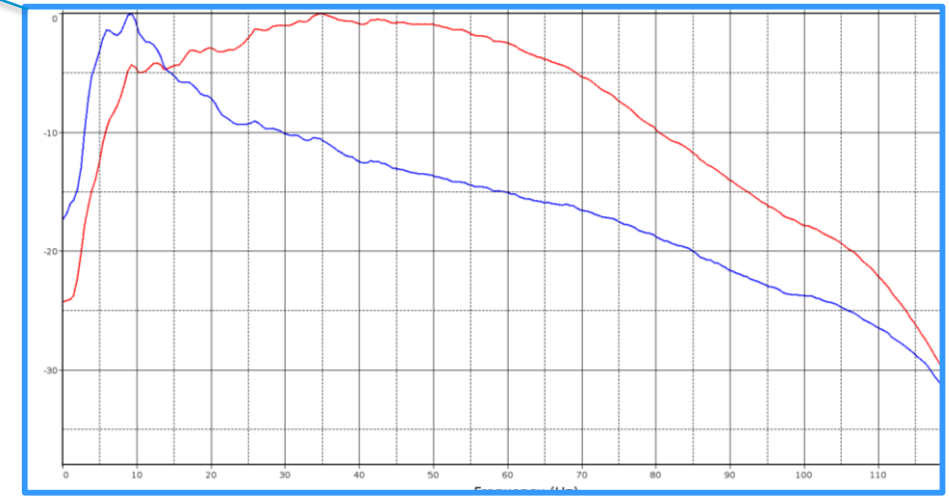
Amplitude Spectra Analysis - Stack









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Shot Gathers

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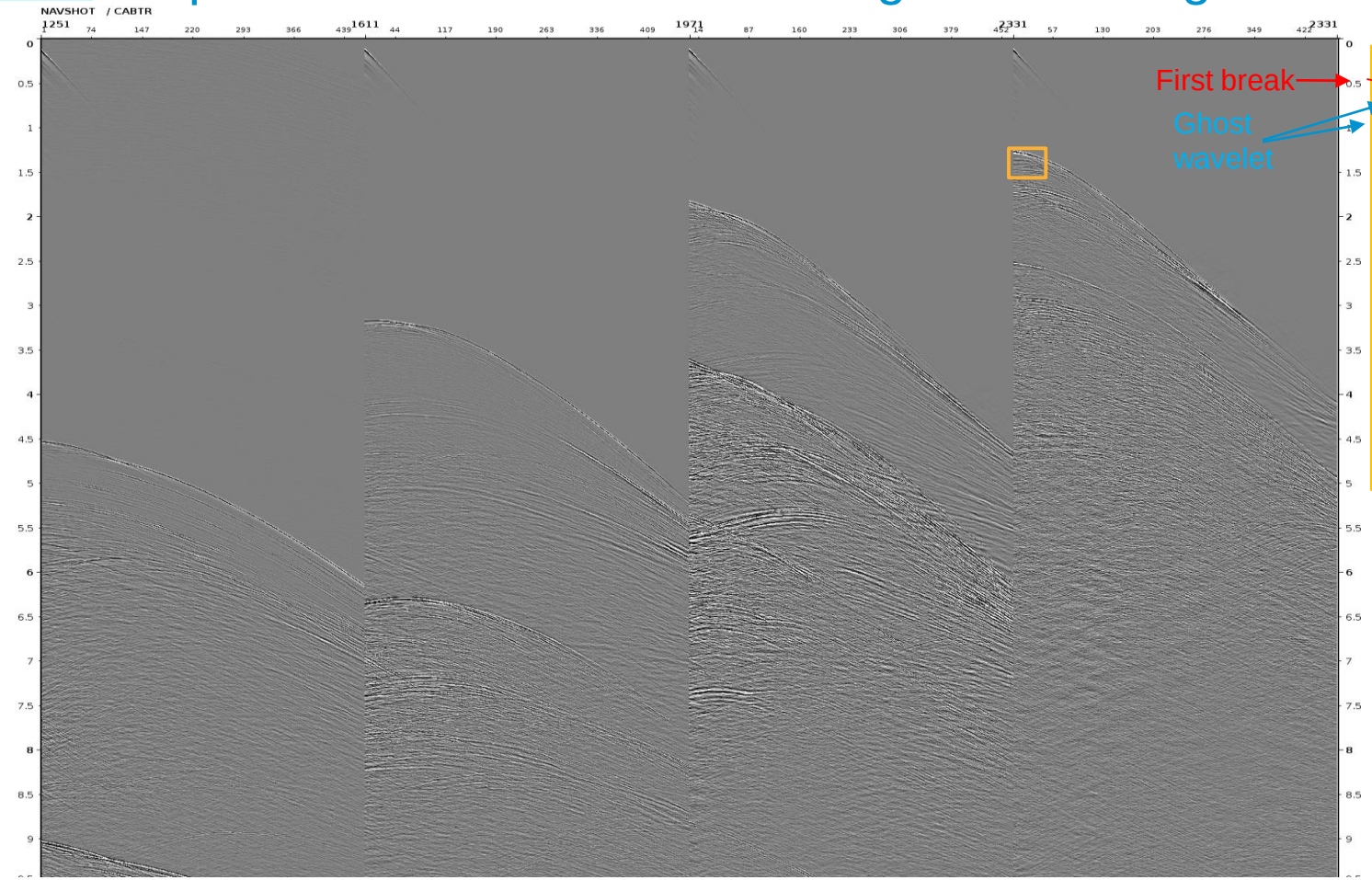
Seq018 Shot Gathers before Deghost & Designature



- Both source and receiver side ghosts are removed.
- Designature shifted the wavelet from minimum phase to zero phase.

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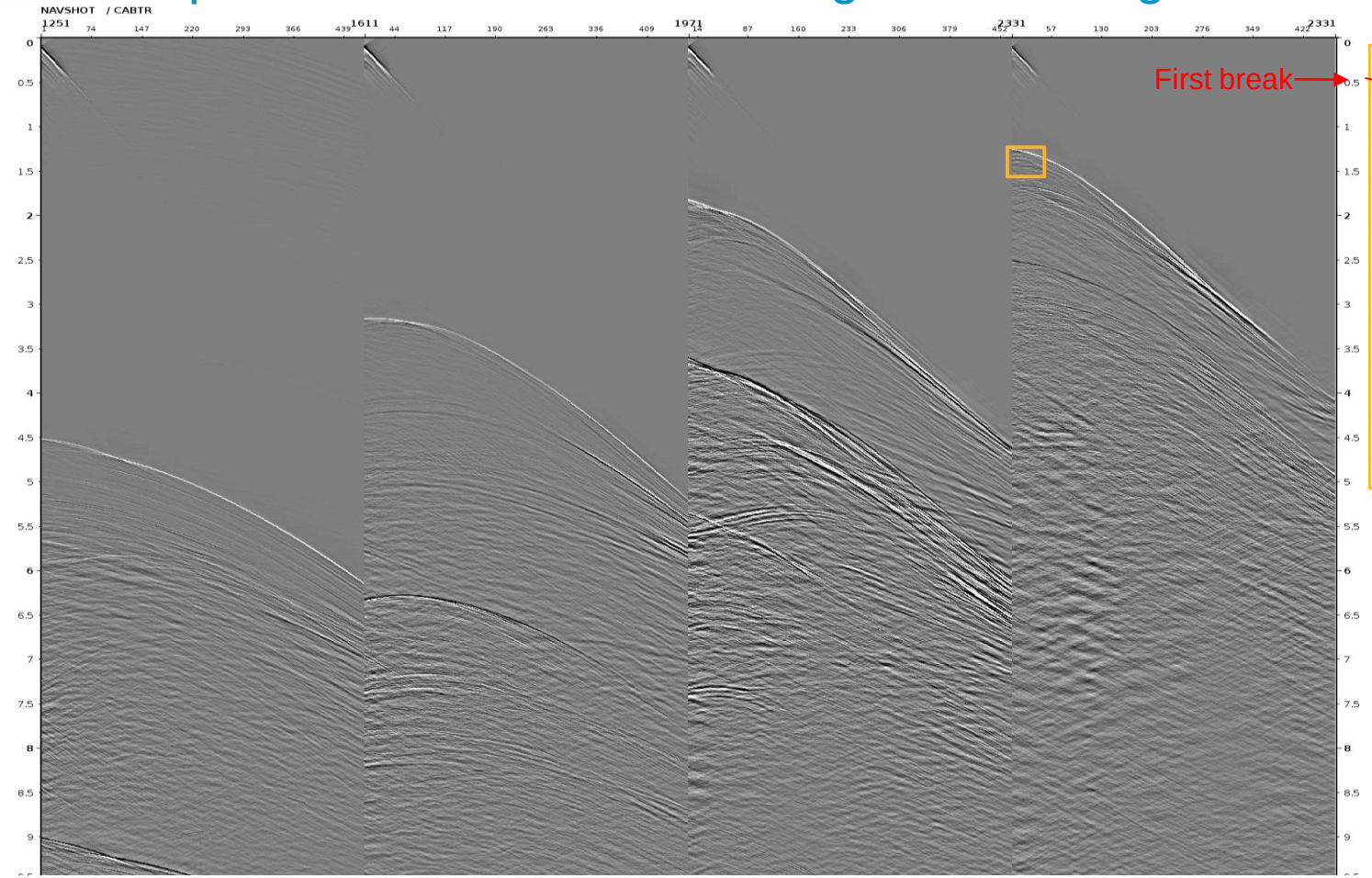

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Common Channel

– channel 10

– channel 100

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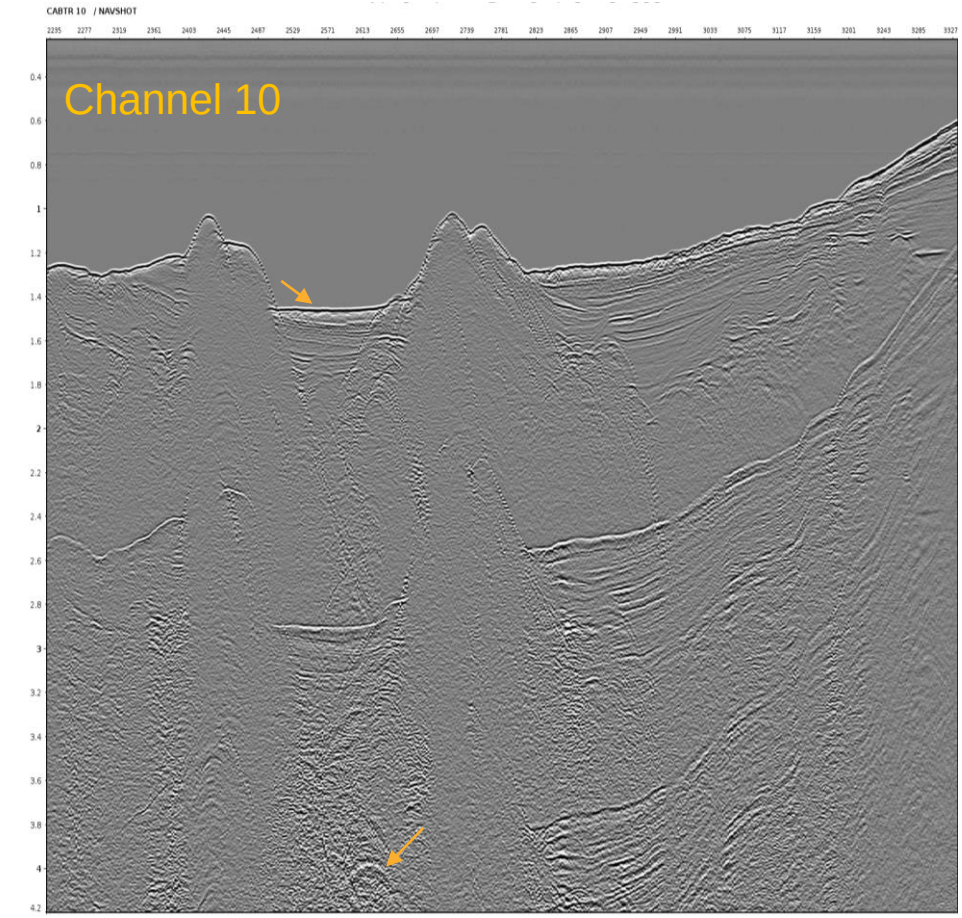
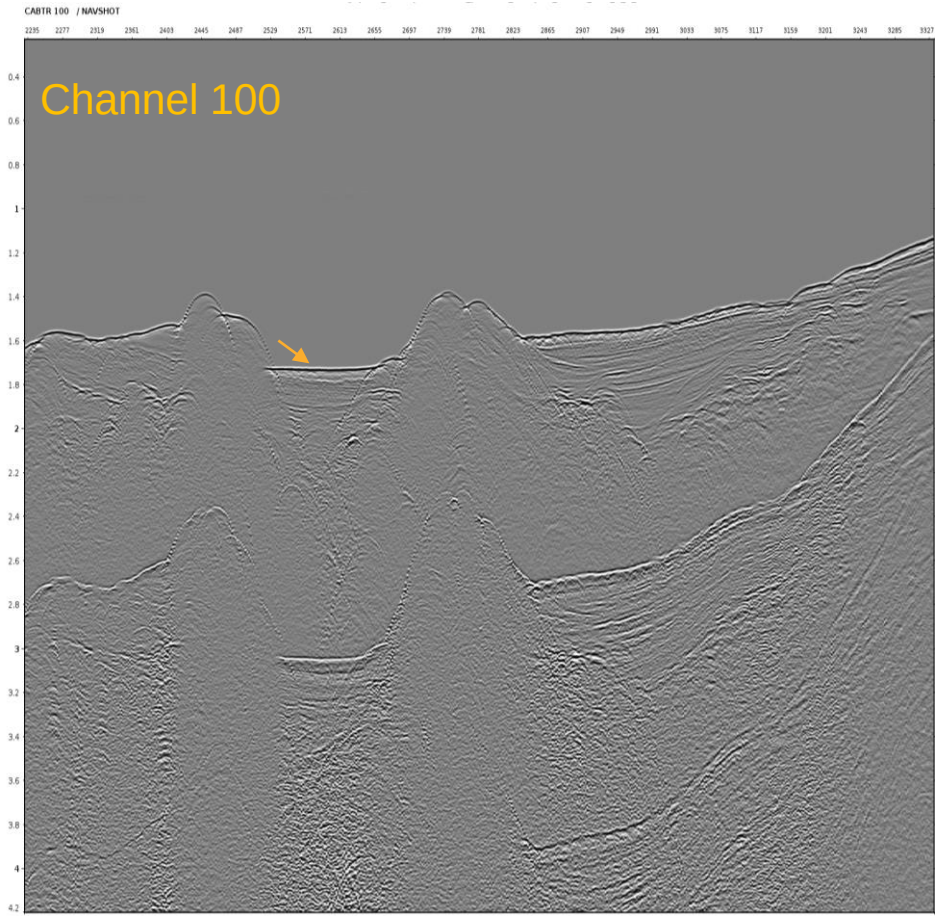
Seq018 Zoom in Common Channel before Deghost & Designature





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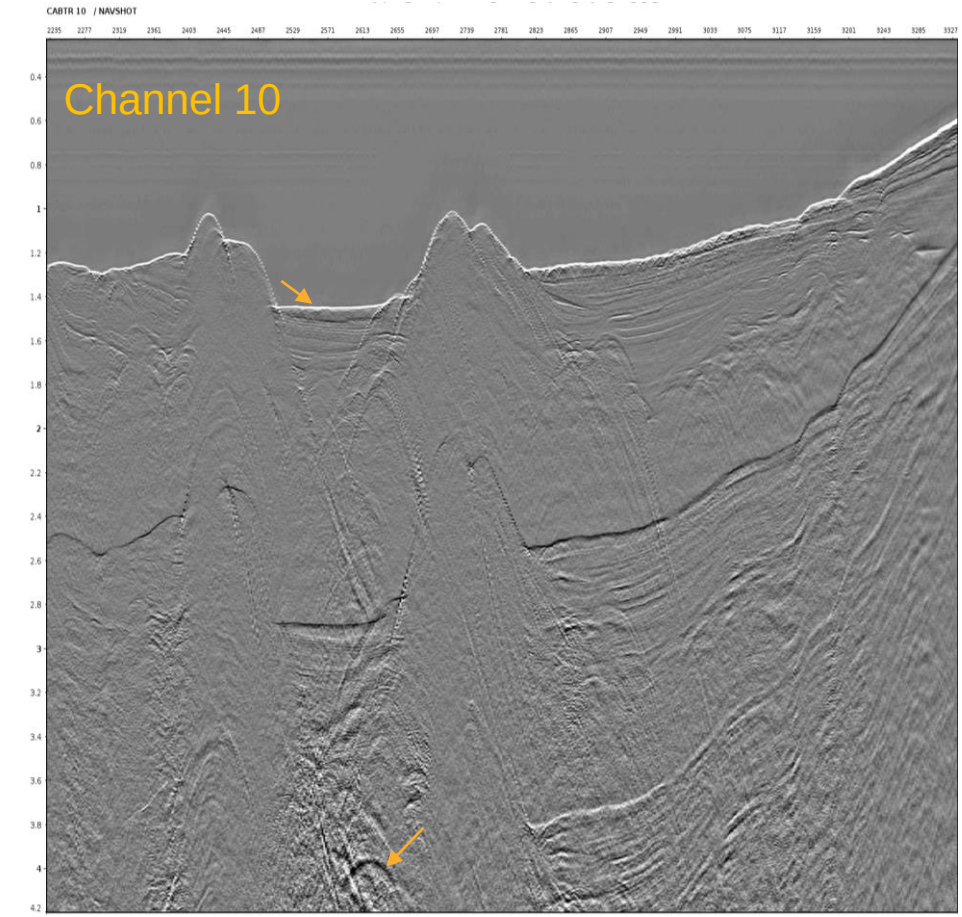
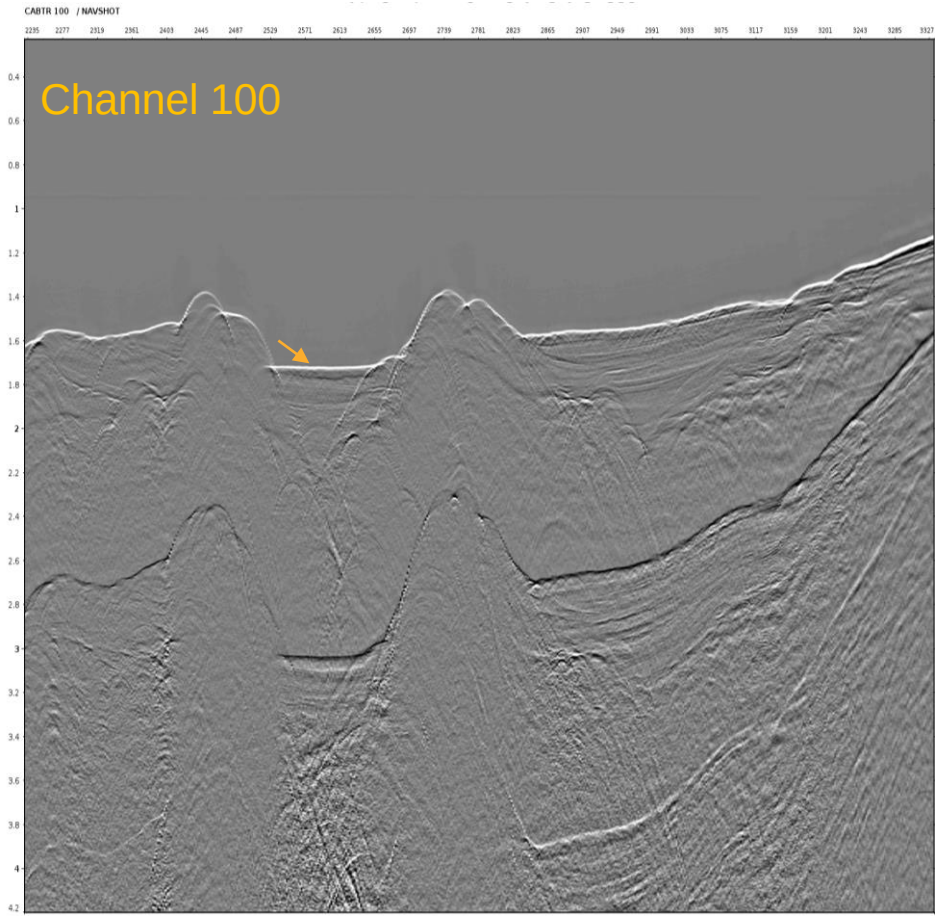
Seq018 Zoom in Common Channel after Deghost & Designature





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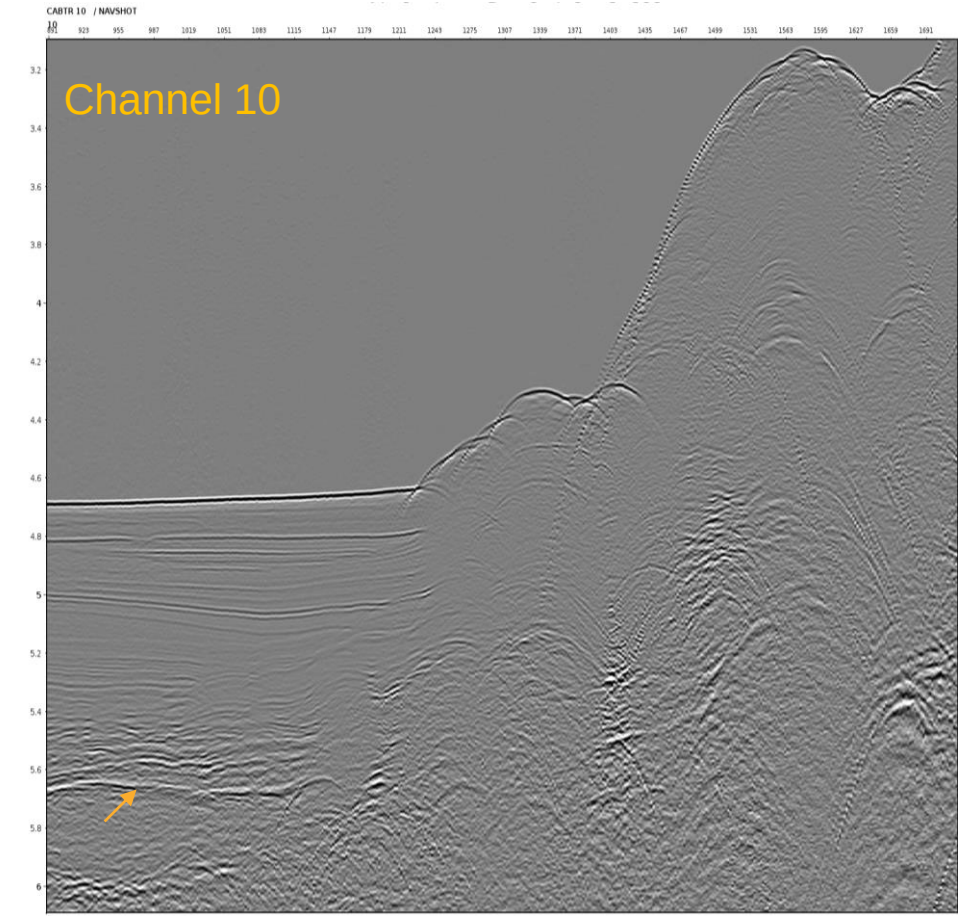
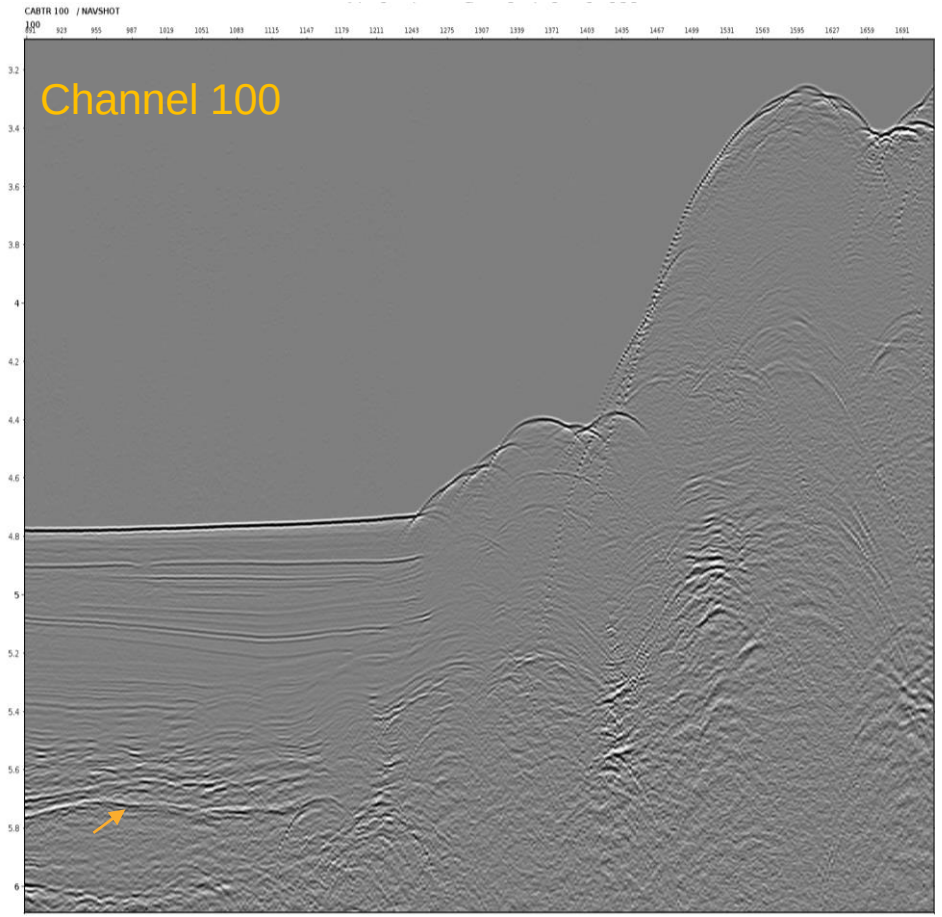
Seq018 Zoom in Common Channel before Deghost & Designature





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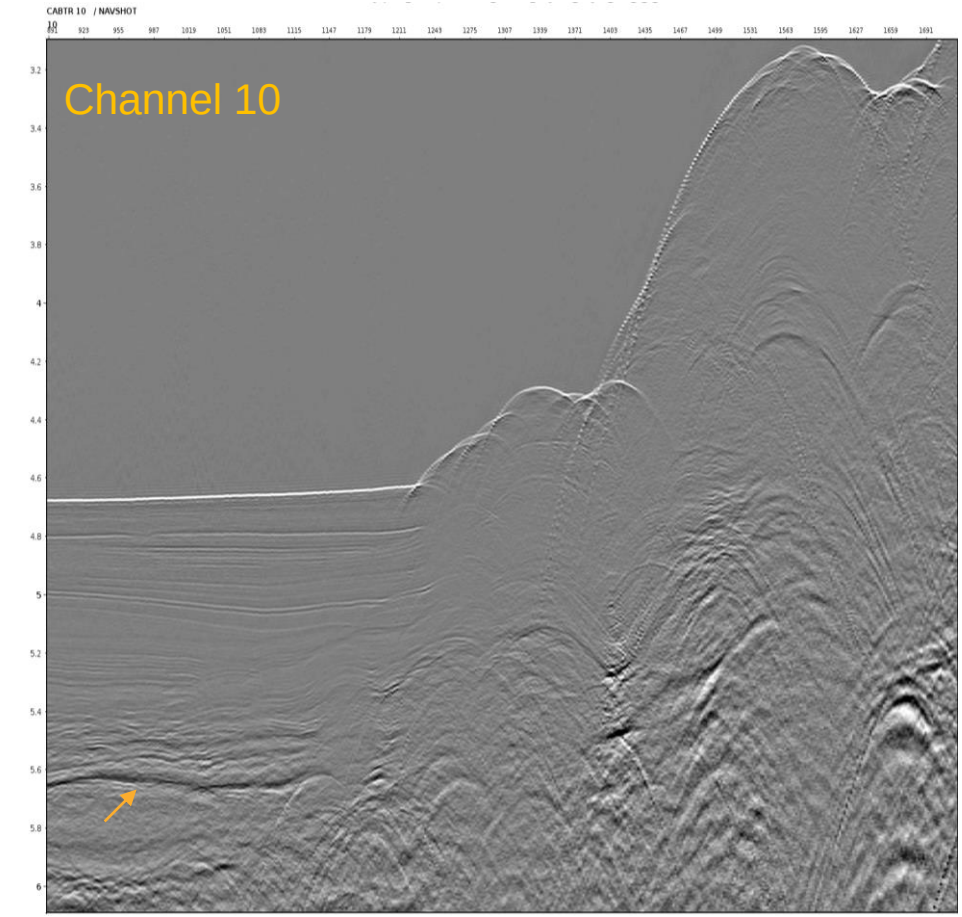
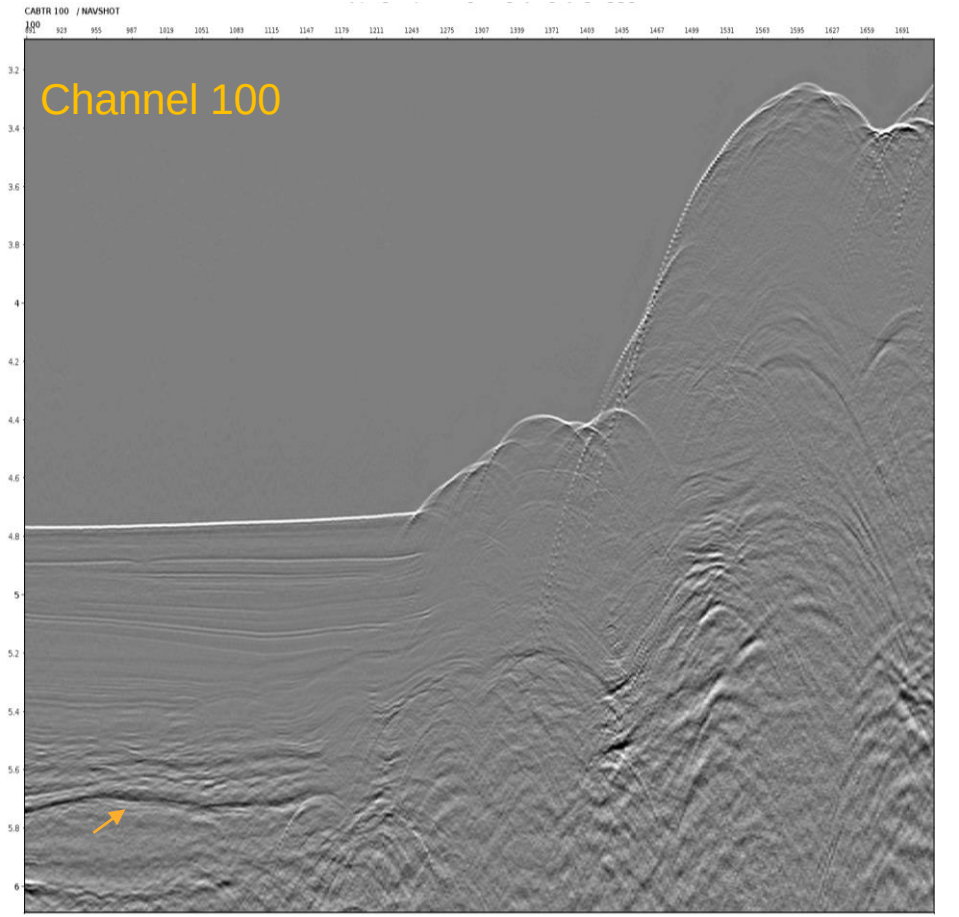
Seq018 Zoom in Common Channel after Deghost & Designature





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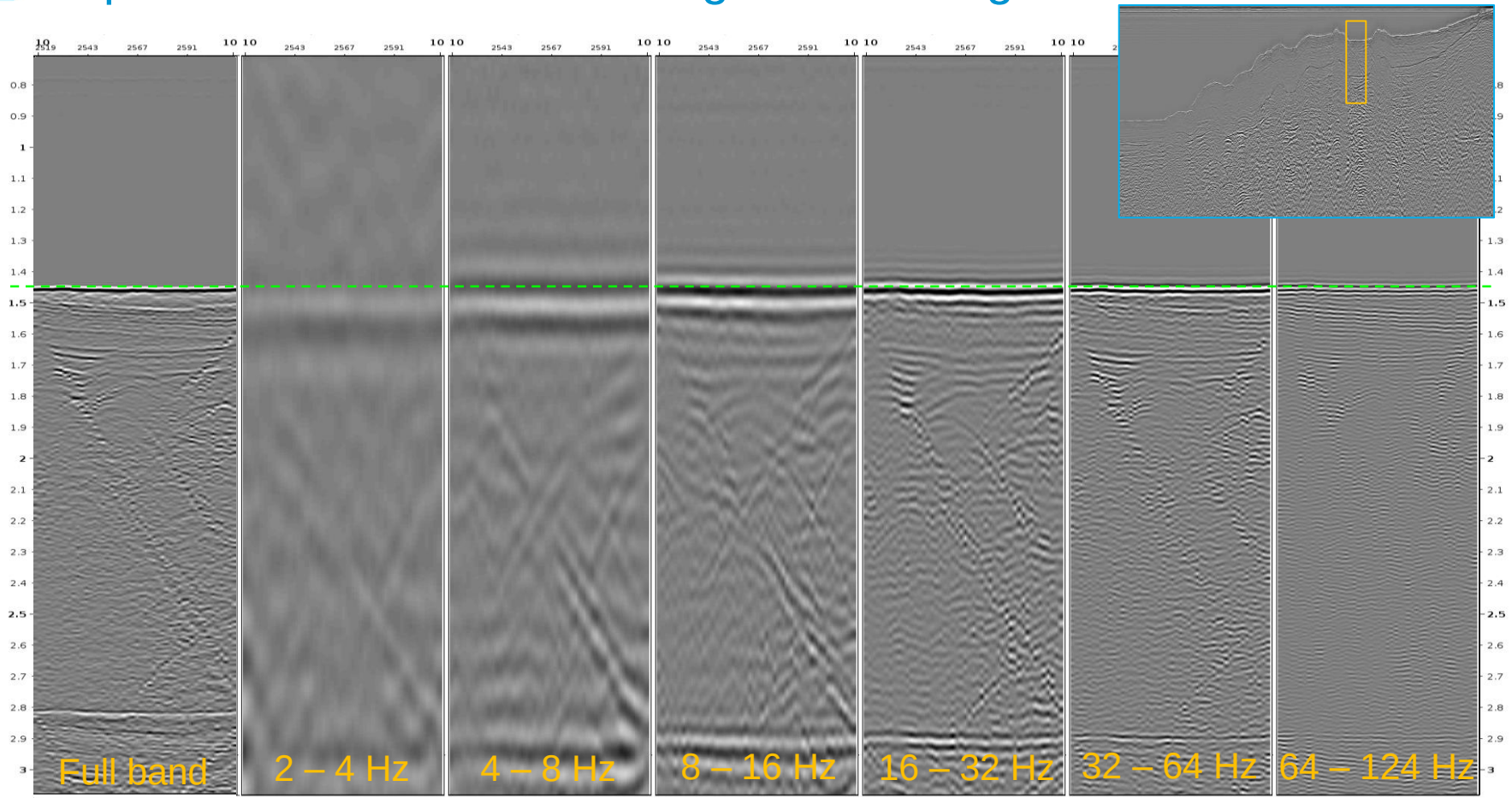
Seq018 Filter Panel before Deghost & Designature



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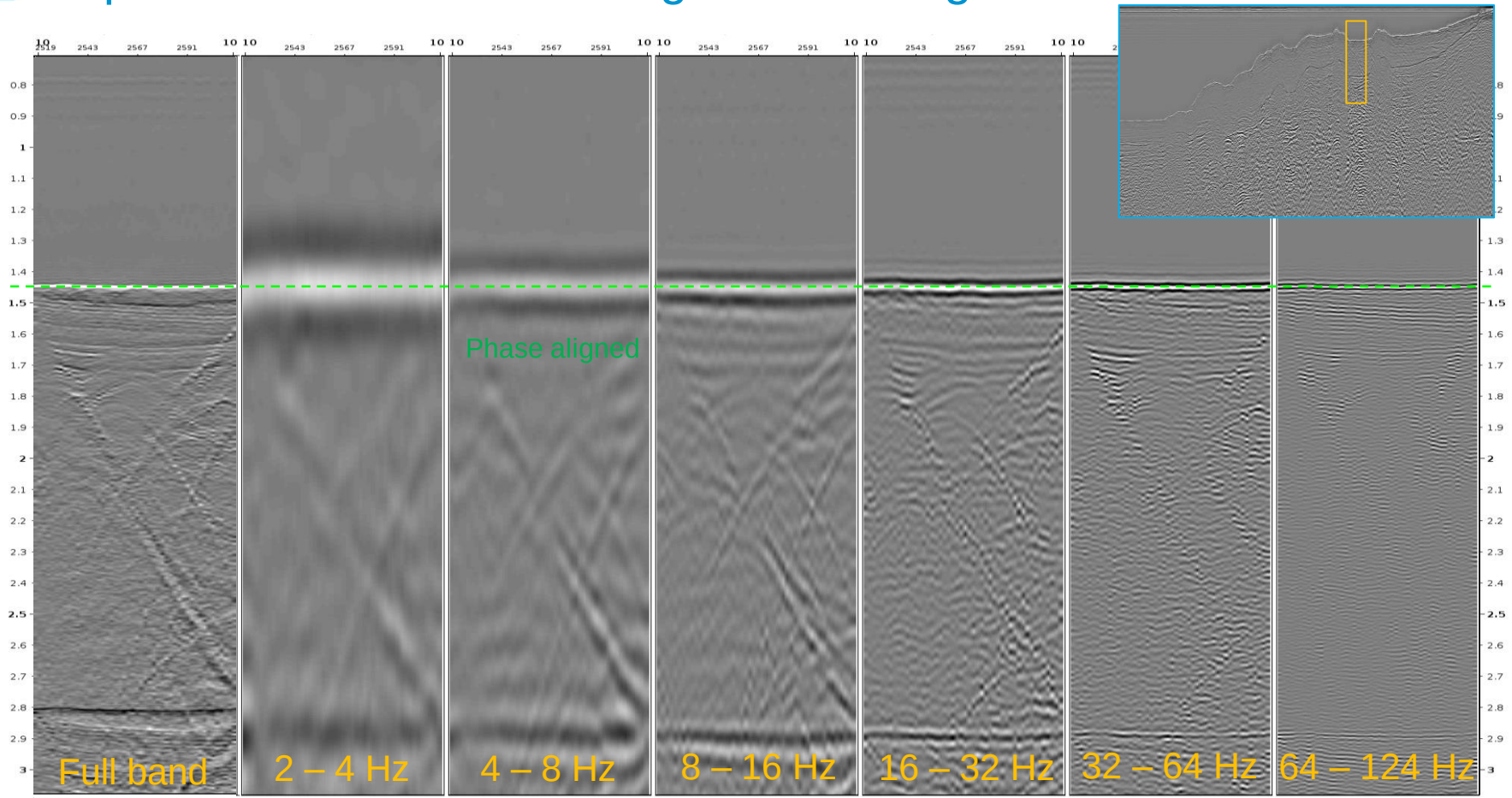
Seq018 Filter Panel after Deghost & Designature



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Seq 039

Receiver Depth Map
Stack
Shot Gather
Common Channel
Filter Panel

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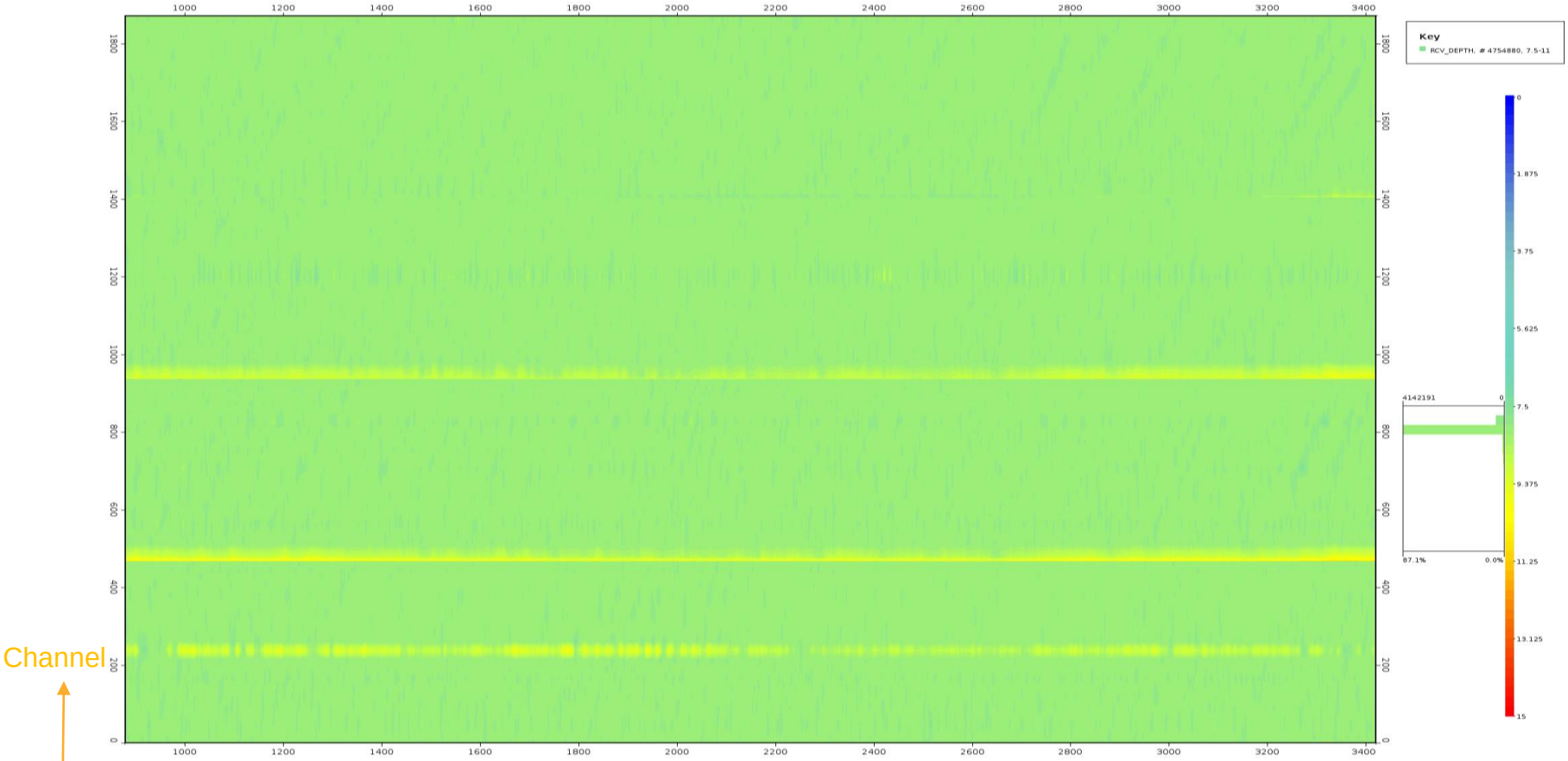
Seq039 Receiver Depth Map



Receiver depths vary 7~9m, so receiver side ghost has a notch frequency around 95Hz.

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Full Stack (0 - 35 deg)

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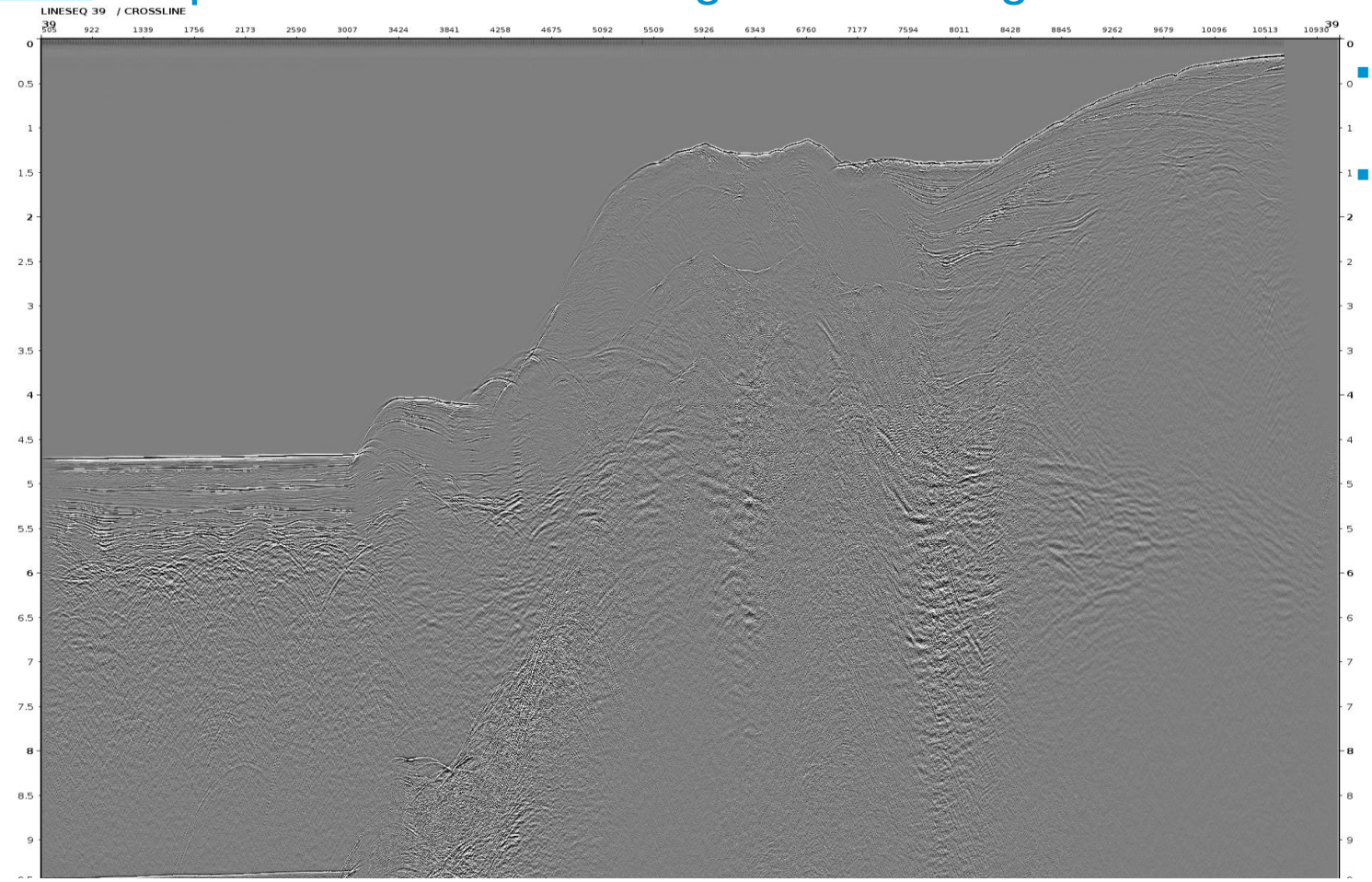
Seq039 Stack before Deghost & Designature



- Ghost effect was removed.
- Primaries are more visible.

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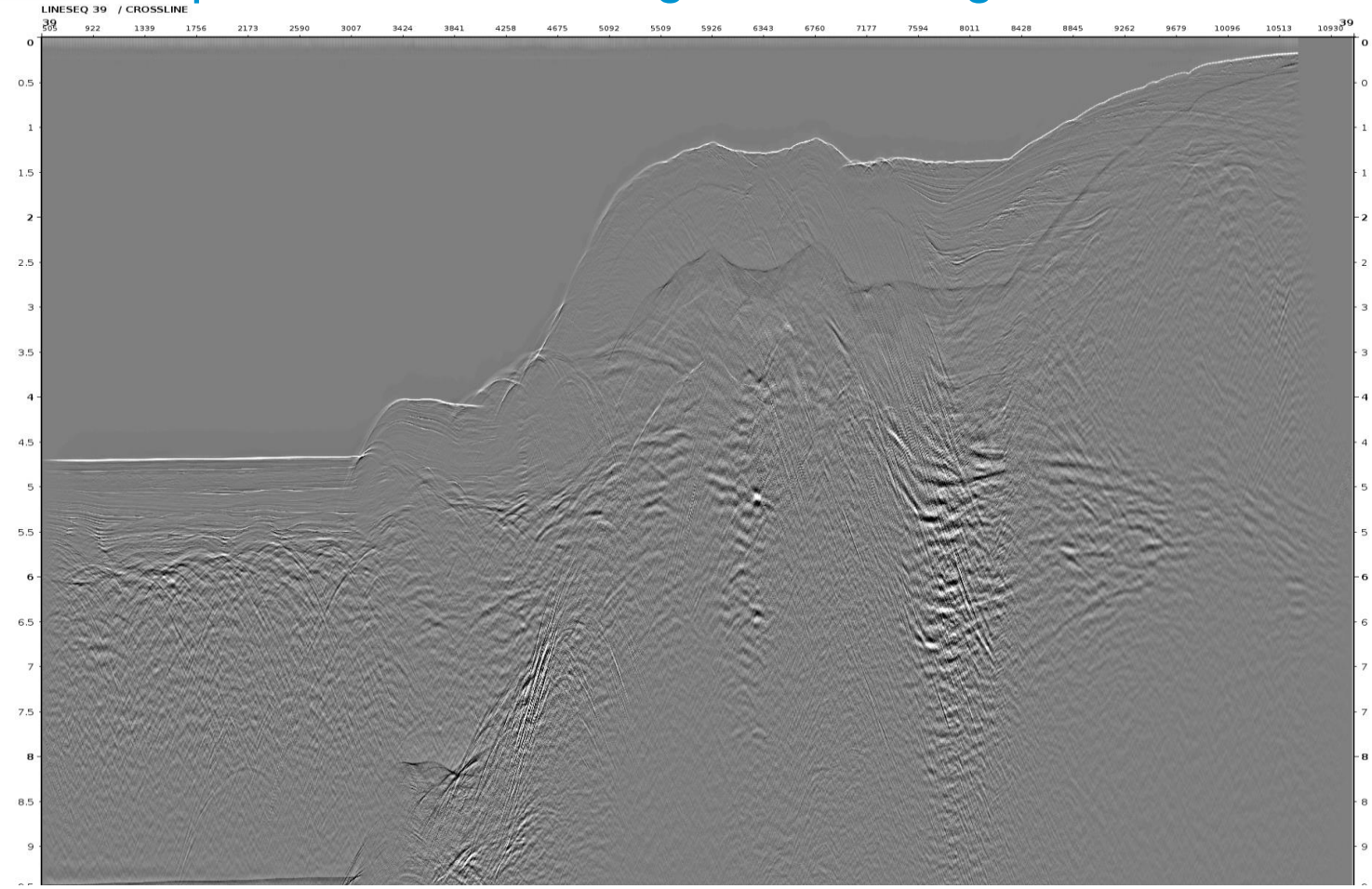
Seq039 Stack after Deghost & Designature



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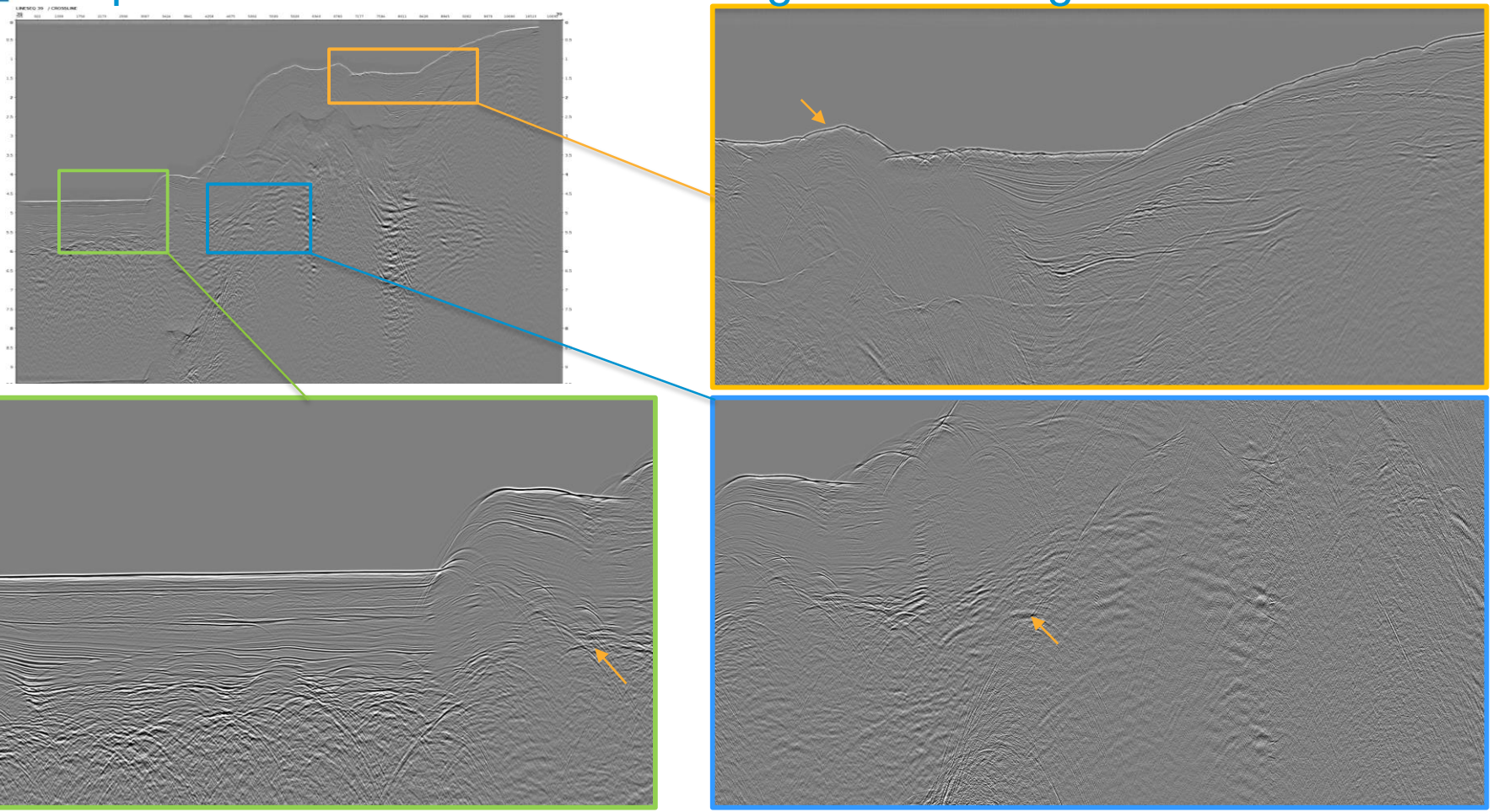
Seq039 Zoom in Stack before Deghost & Designature



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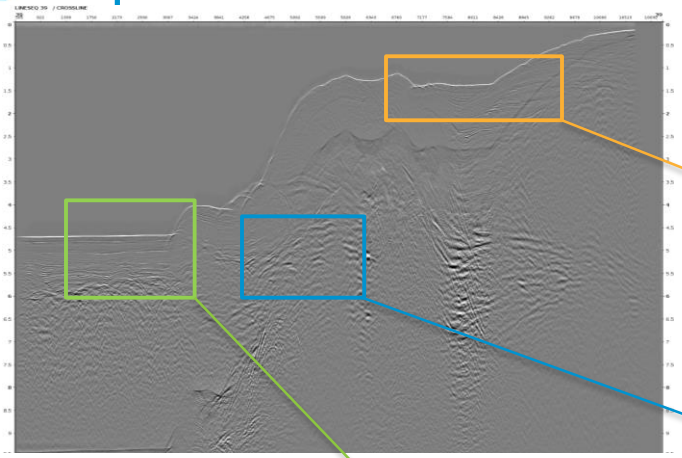
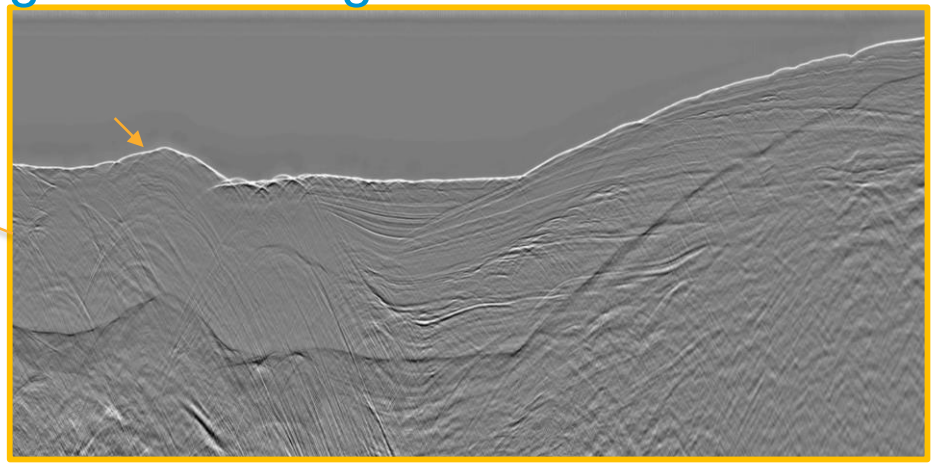
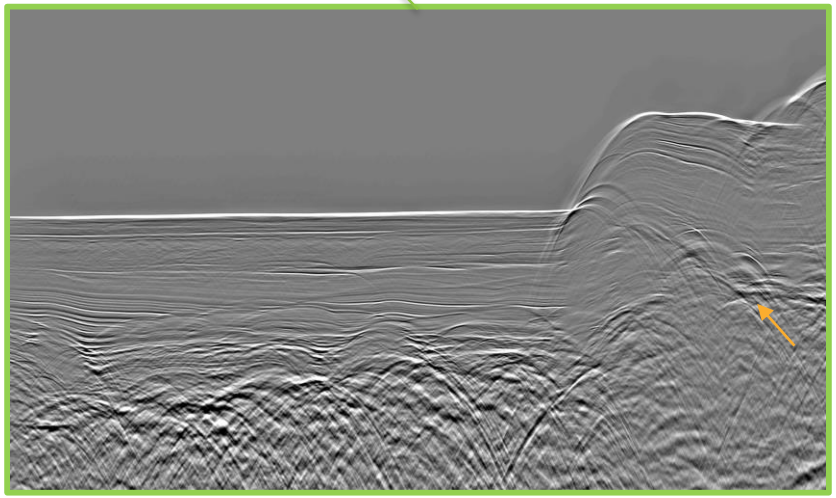
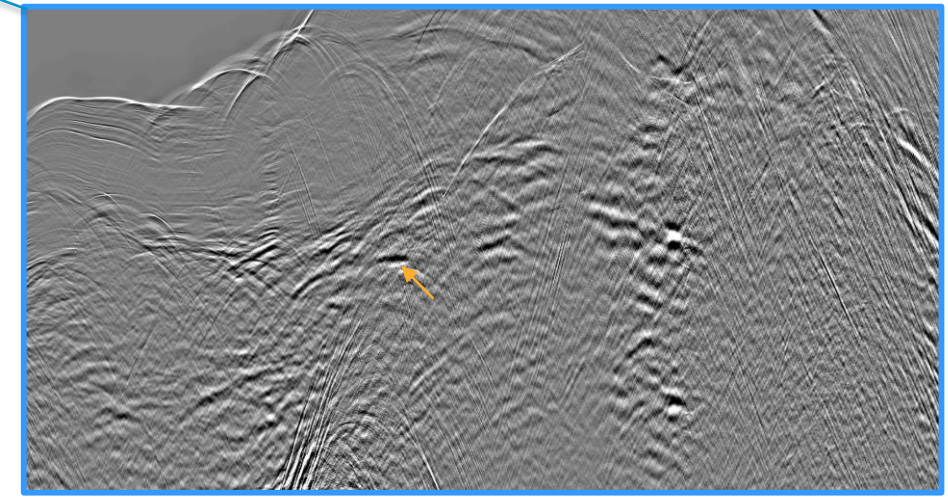
Seq039 Zoom in Stack after Deghost & Designature









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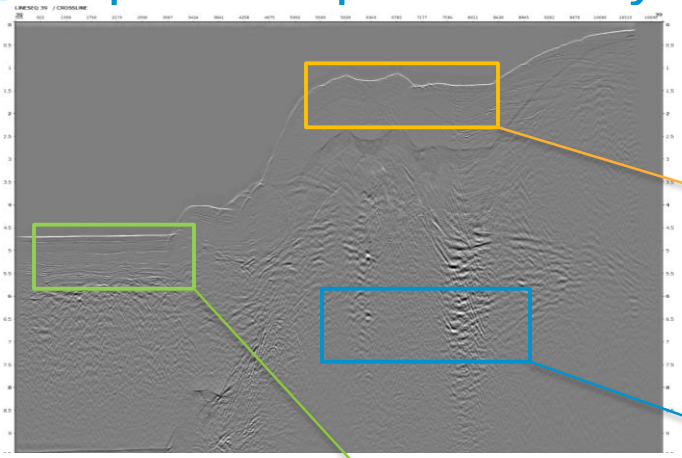
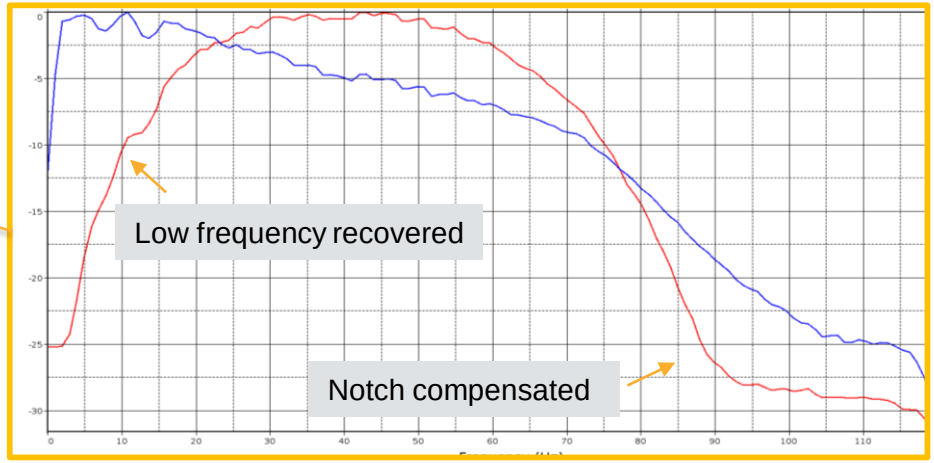
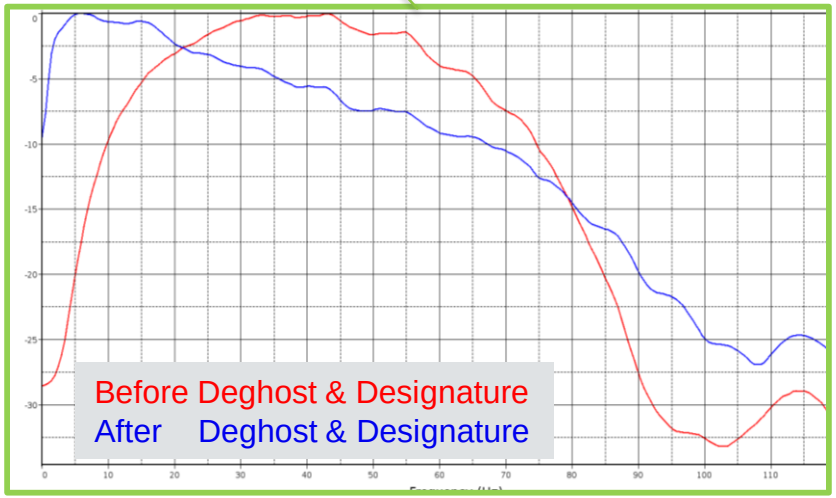
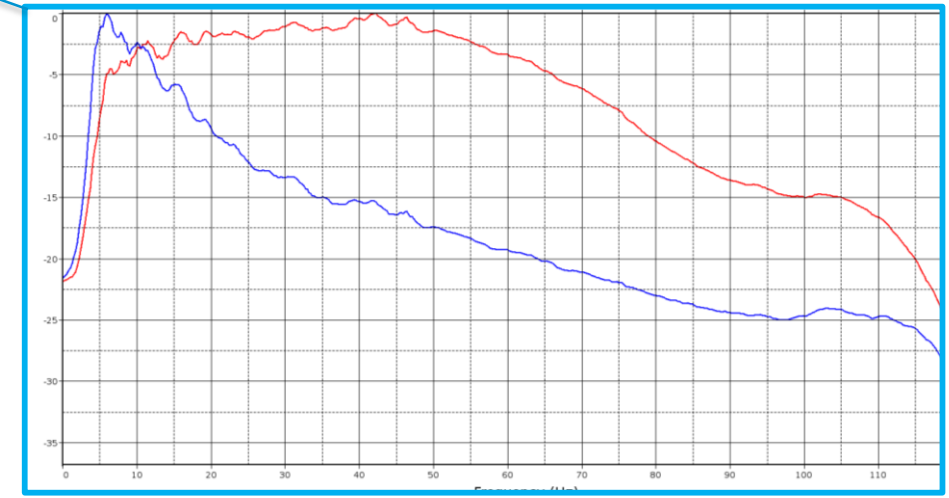
Amplitude Spectra Analysis - Stack









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Shot Gathers

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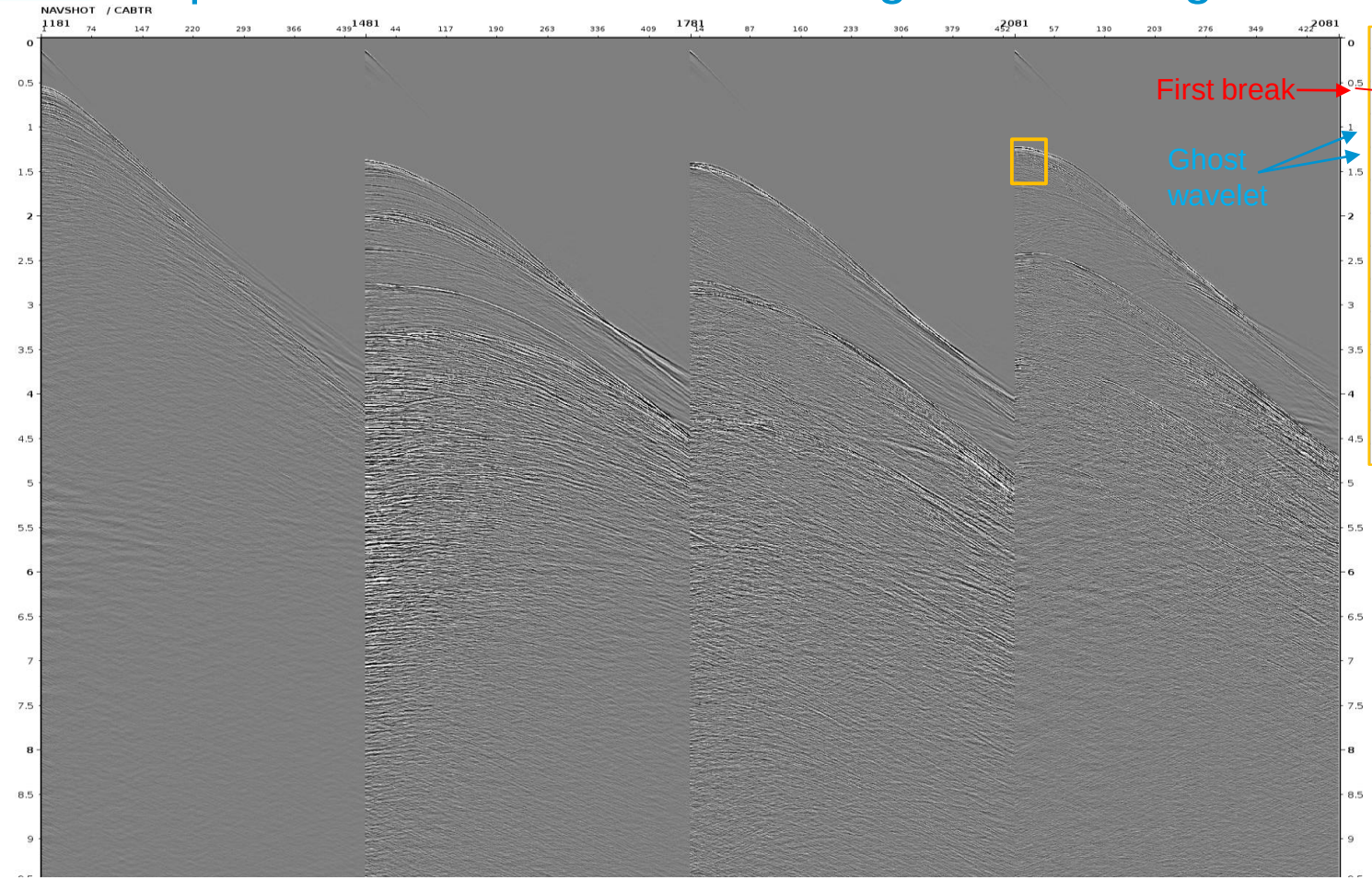
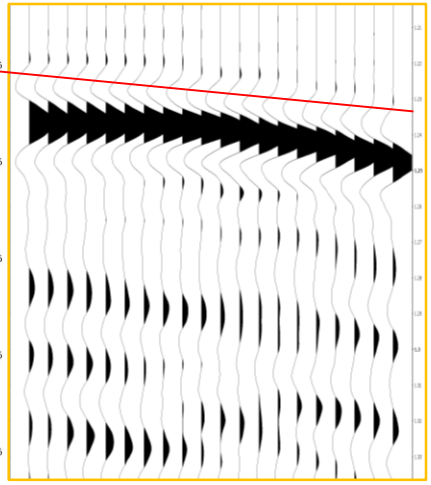
Seq039 Shot Gathers before Deghost & Designature





- Both source and receiver side ghosts are removed.
- Designature shifted the wavelet from minimum phase to zero phase.

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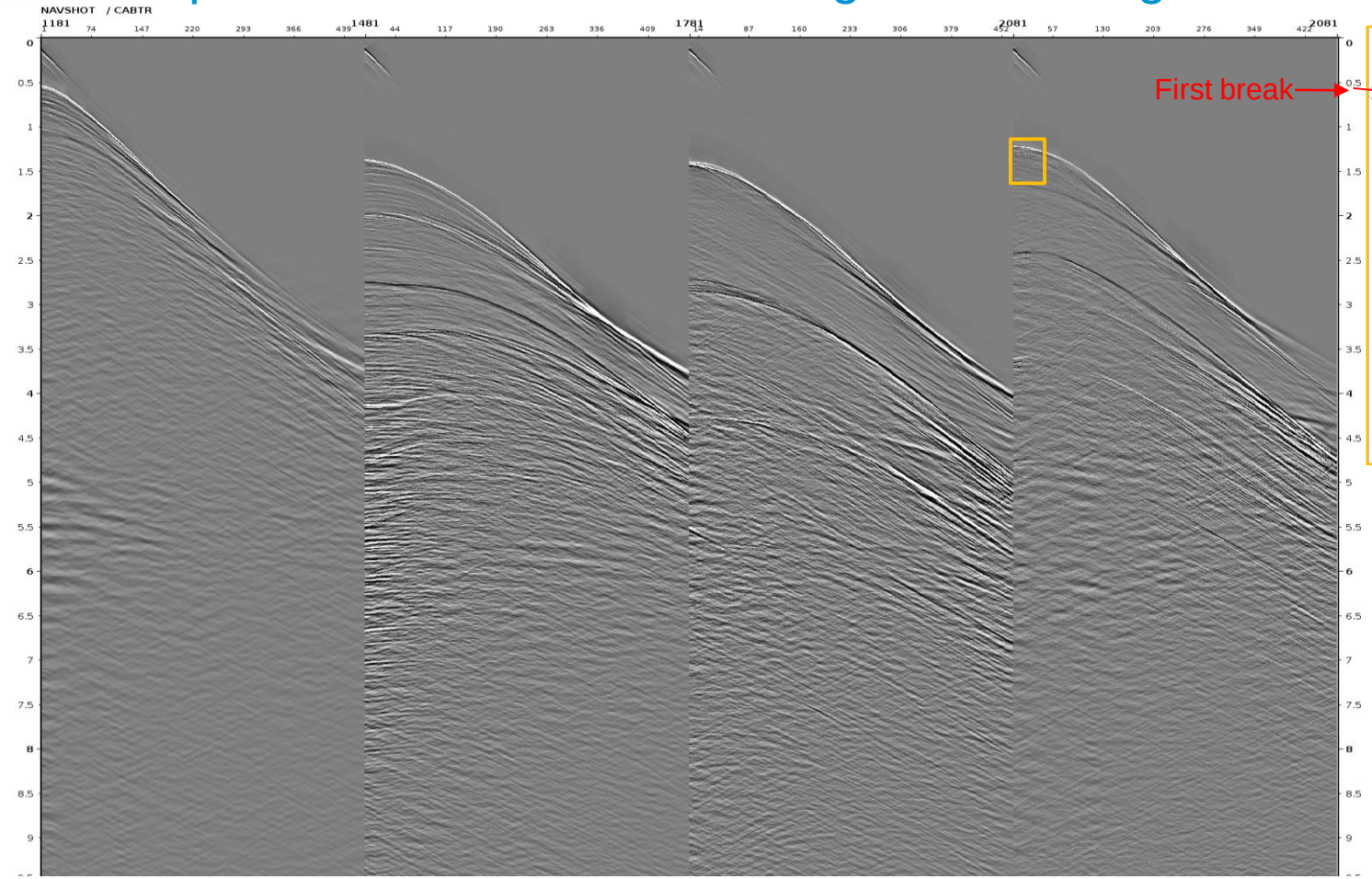
Seq039 Shot Gathers after Deghost & Designature



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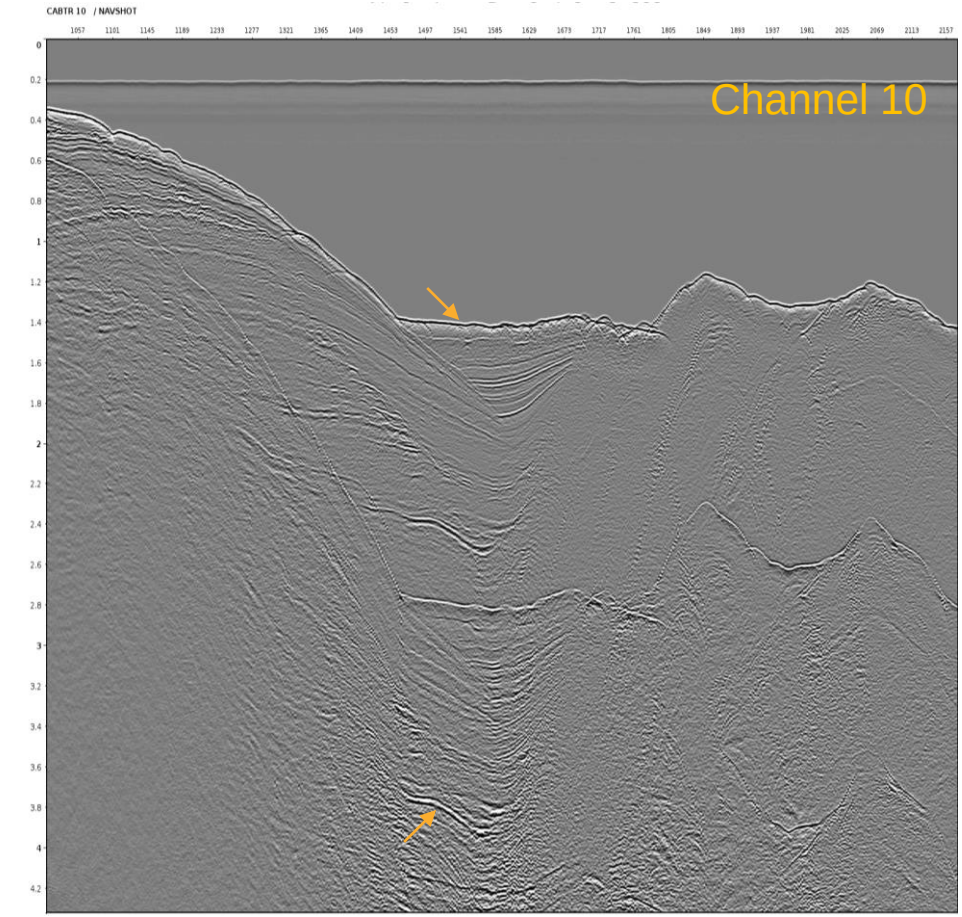
Common Channel

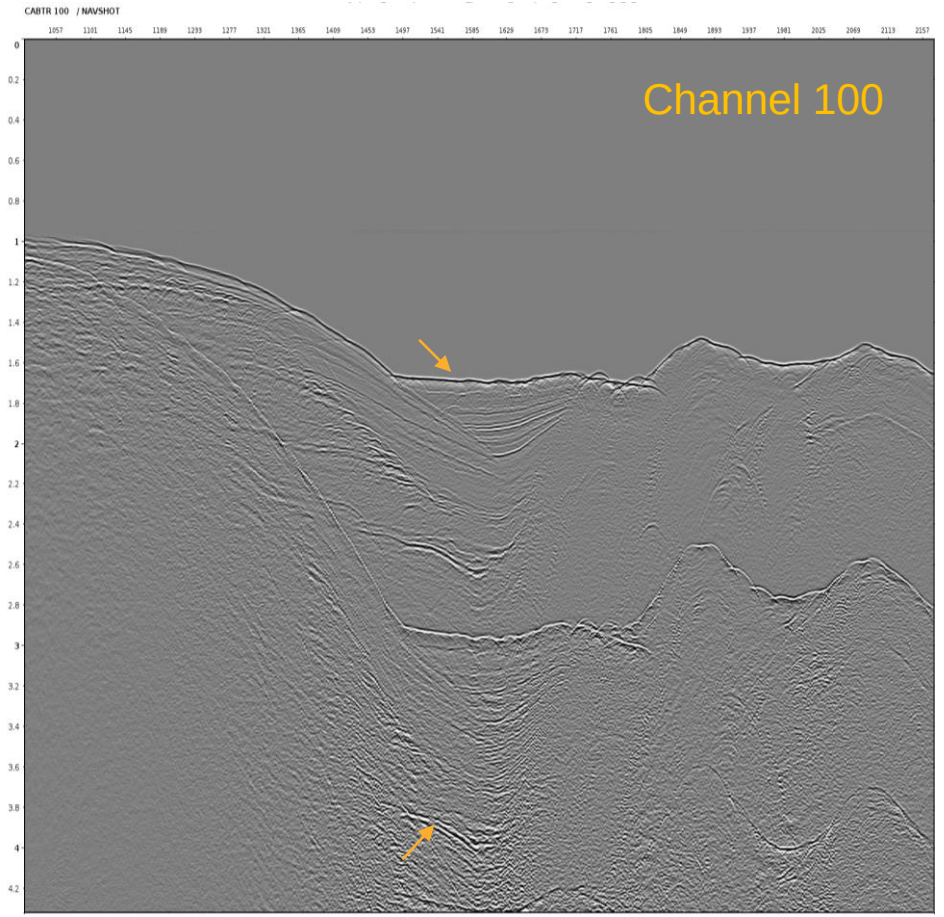
– channel 10

– channel 100

Passion for Geoscience

Seq039 Zoom in Common Channel before Deghost & Designature





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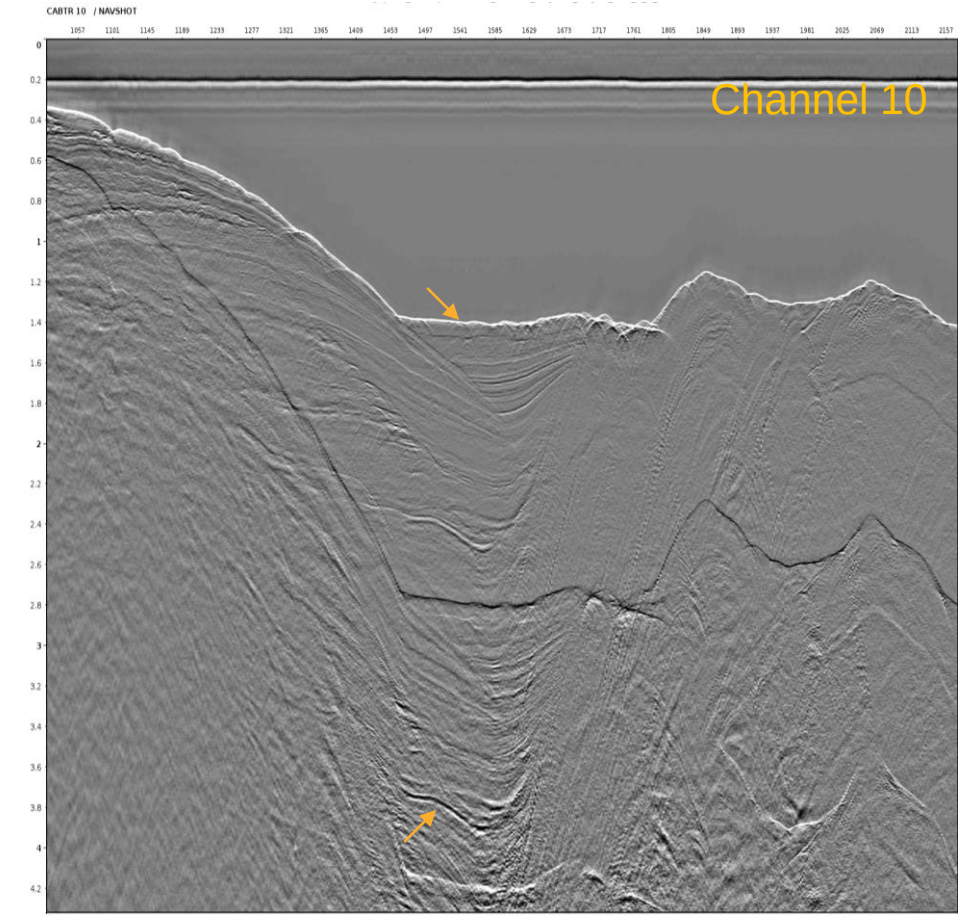

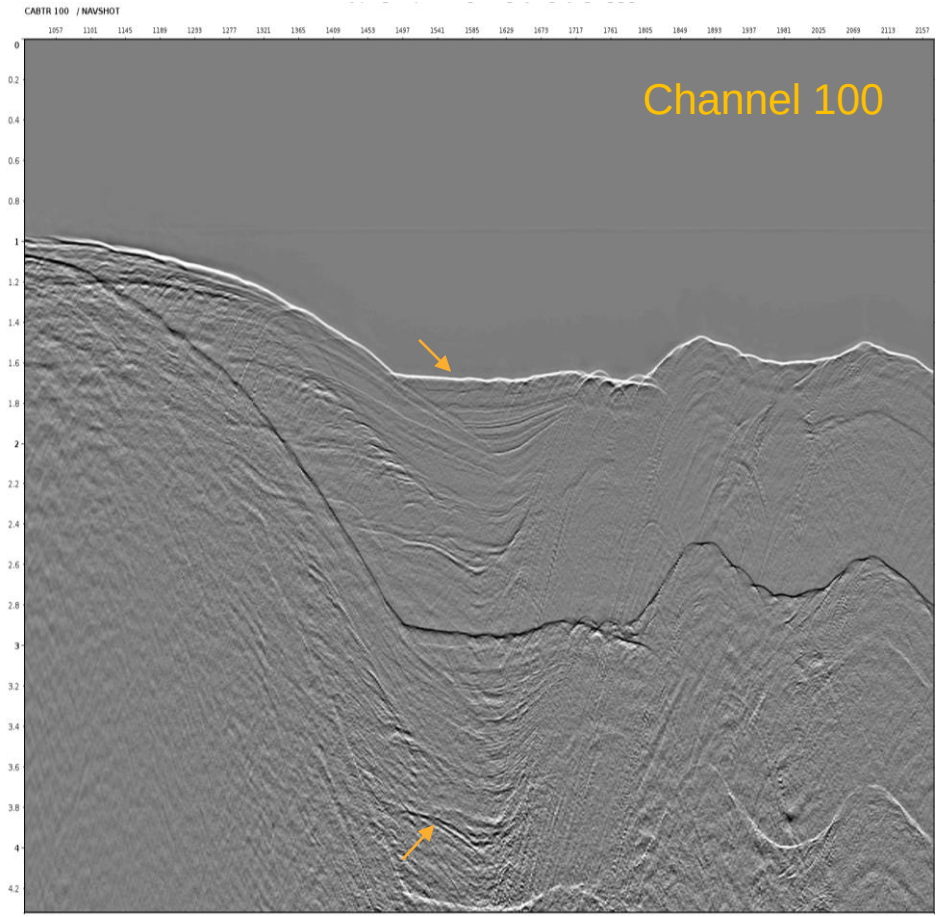

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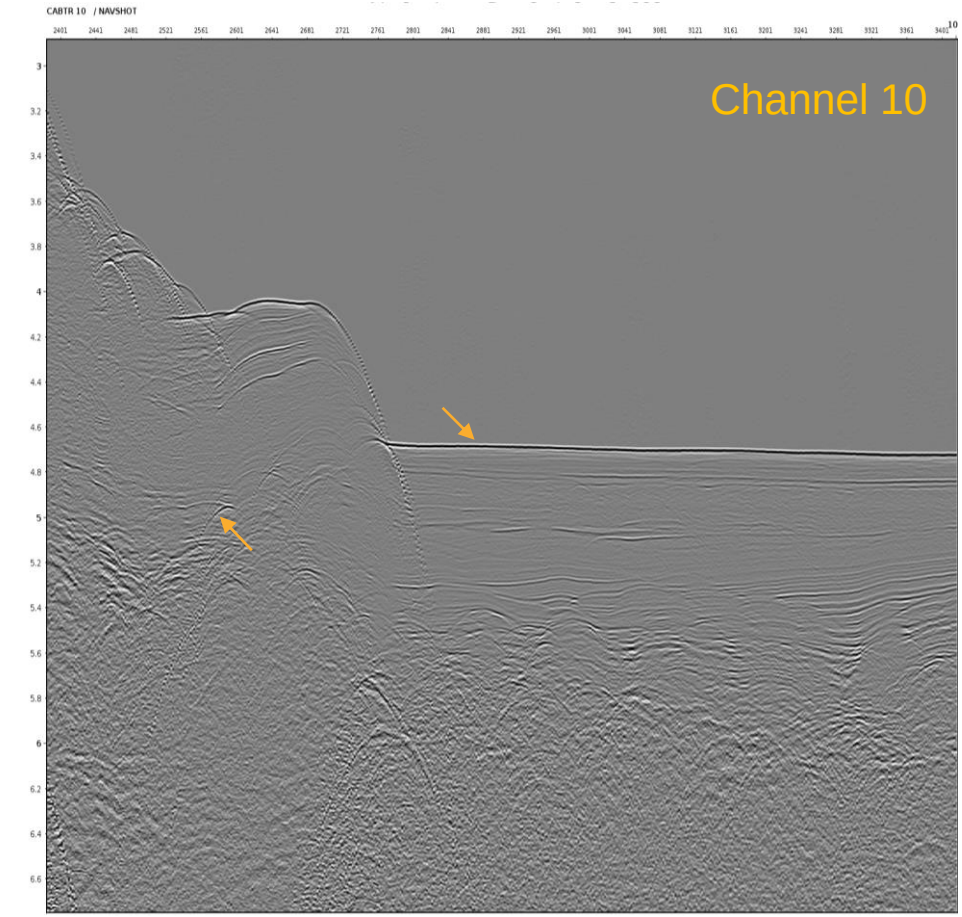
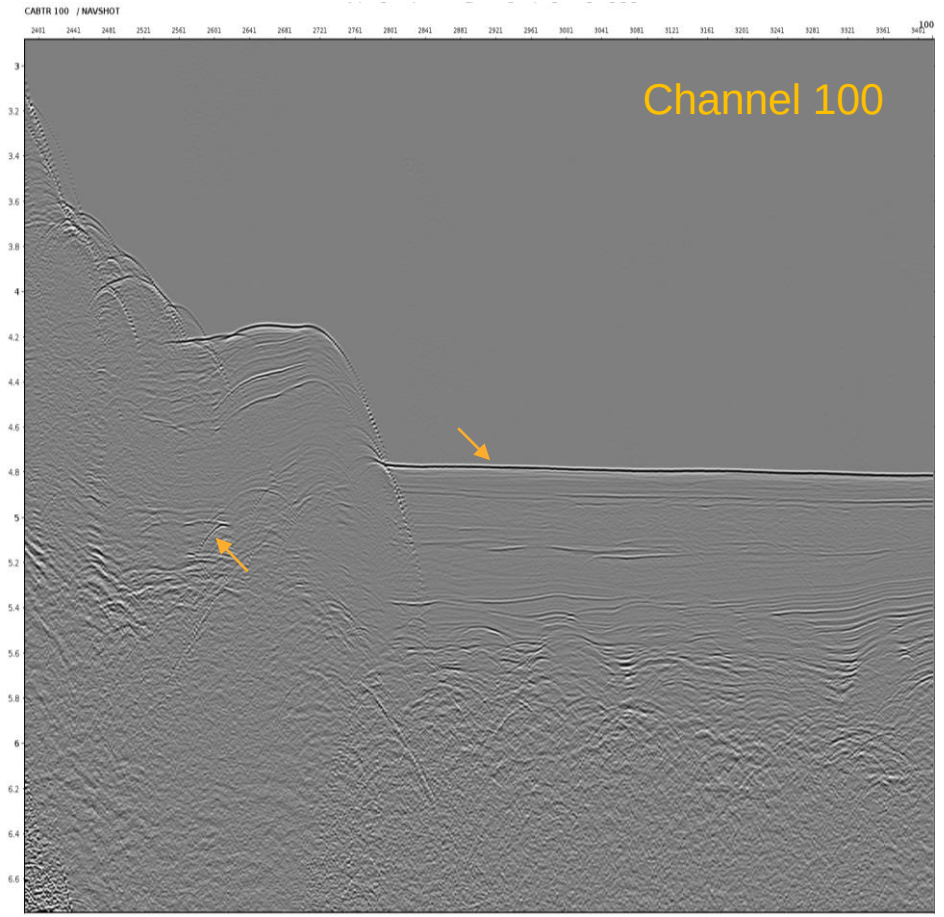
Seq039 Zoom in Common Channel before Deghost & Designature





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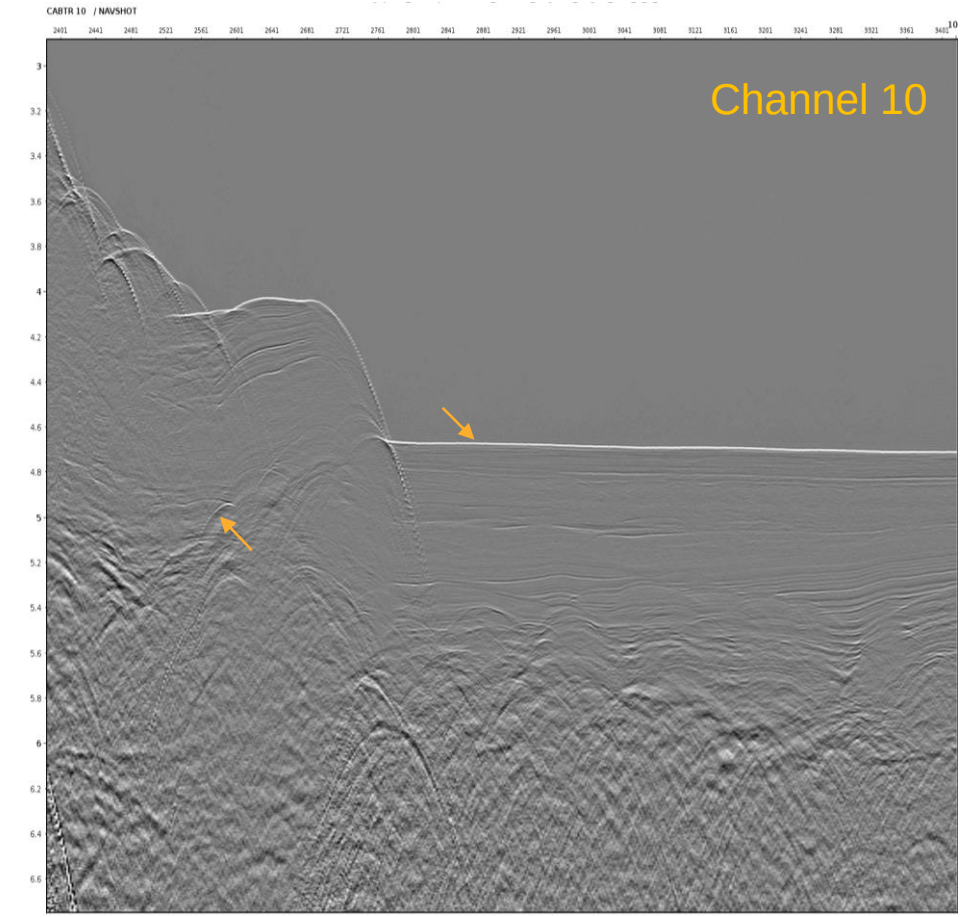

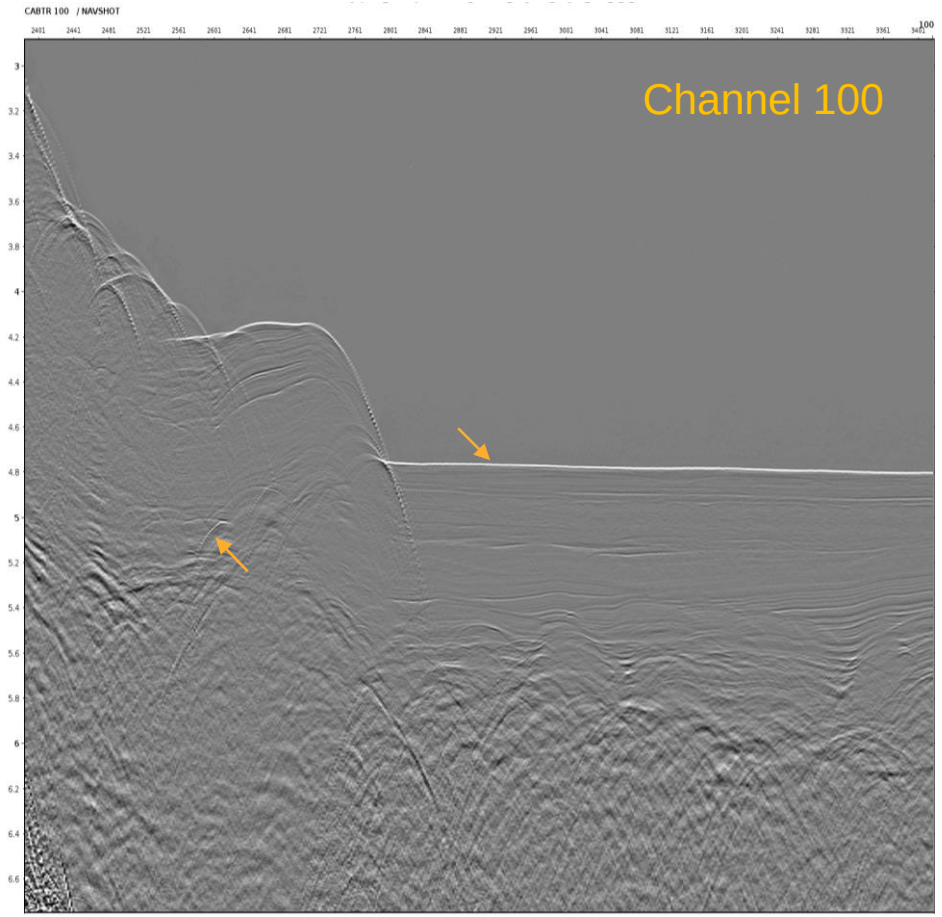

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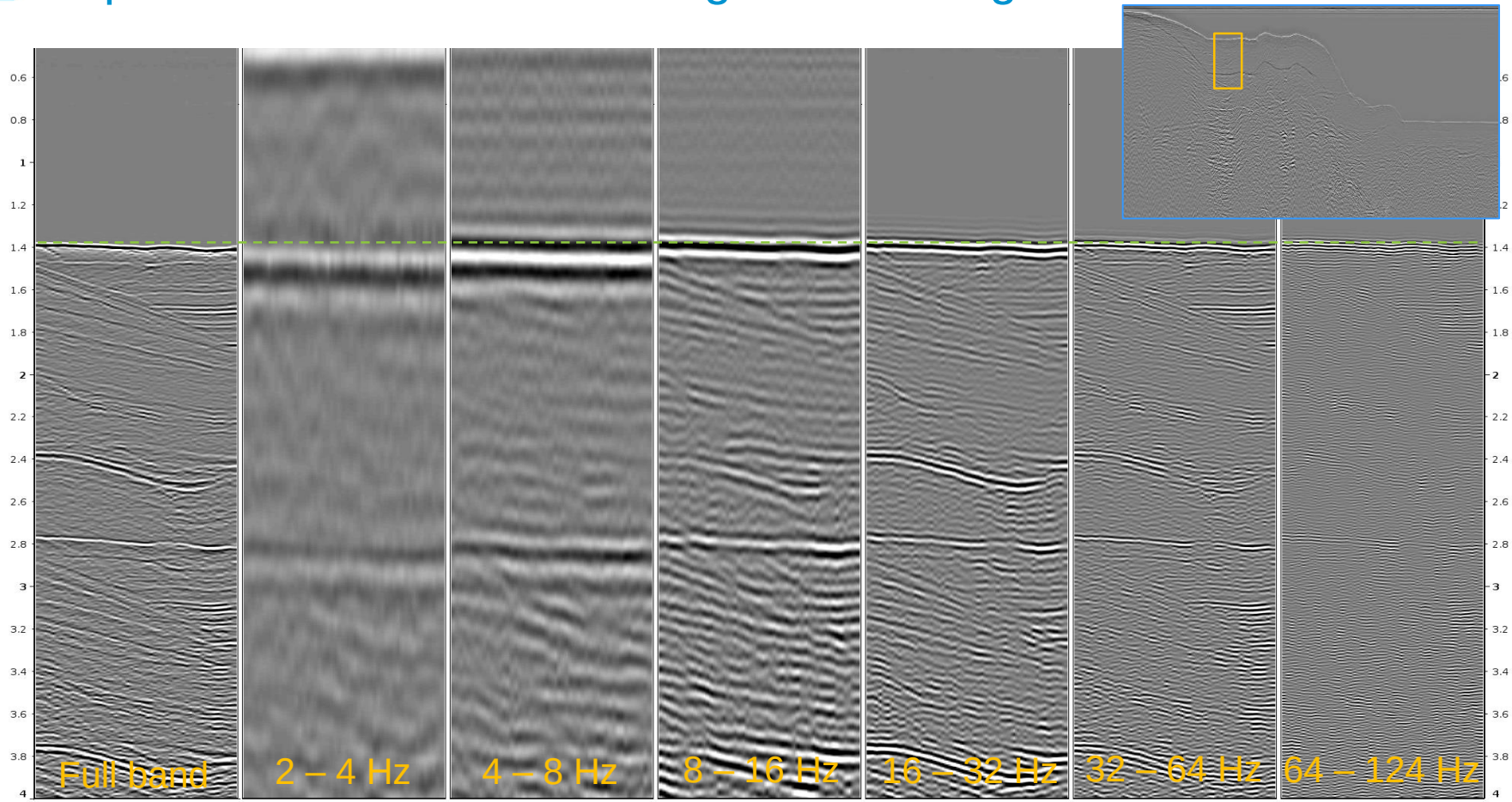
Seq039 Filter Panel before Deghost & Designature



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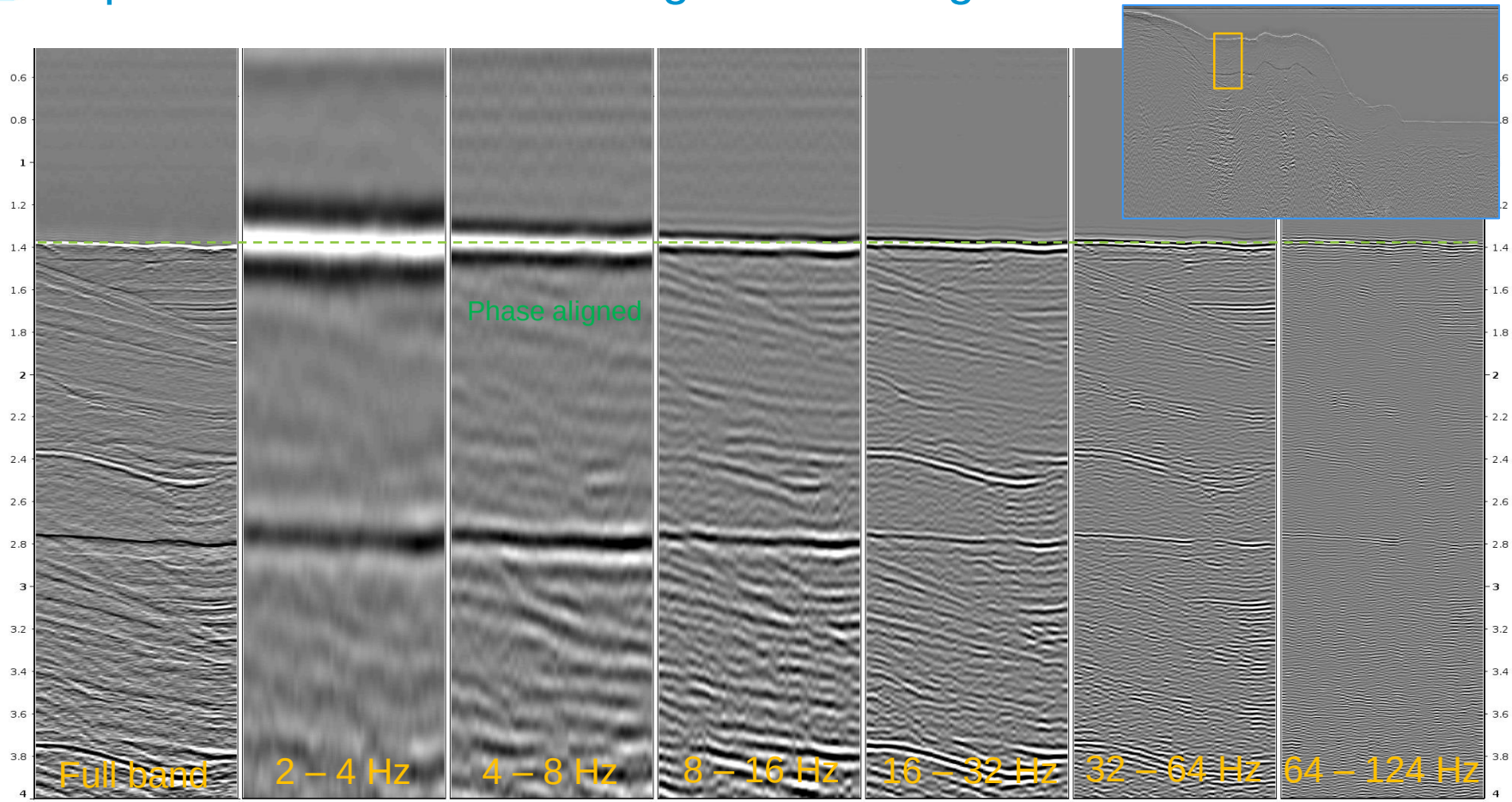
Seq039 Filter Panel after Deghost & Designature



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