

# UOBR017-SCAN018 Velocities, Amplitudes and Residual Statics Report

GTO-19-C031-02 SCAN Acquisition Seismic Processing Order #2

12 JANUARY 2021

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2D Seismic PreSTM Processing, Onshore Netherlands

- This report documents results from the surface consistent residual statics, surface consistent amplitude compensation and velocity analyses.
- The report also includes amplitude spectra taken from the true amplitude stacks at the key processing stages indicated in the processing sequence on the subsequent slides.
- Additional noise attenuation of TFDN on CDPs was applied to attenuate the residual noise identified in the 'Initial Processing' presentation (sCAnPr\_007\_UOBR017-SCAN018\_InitialProcessing\_201230.pdf)

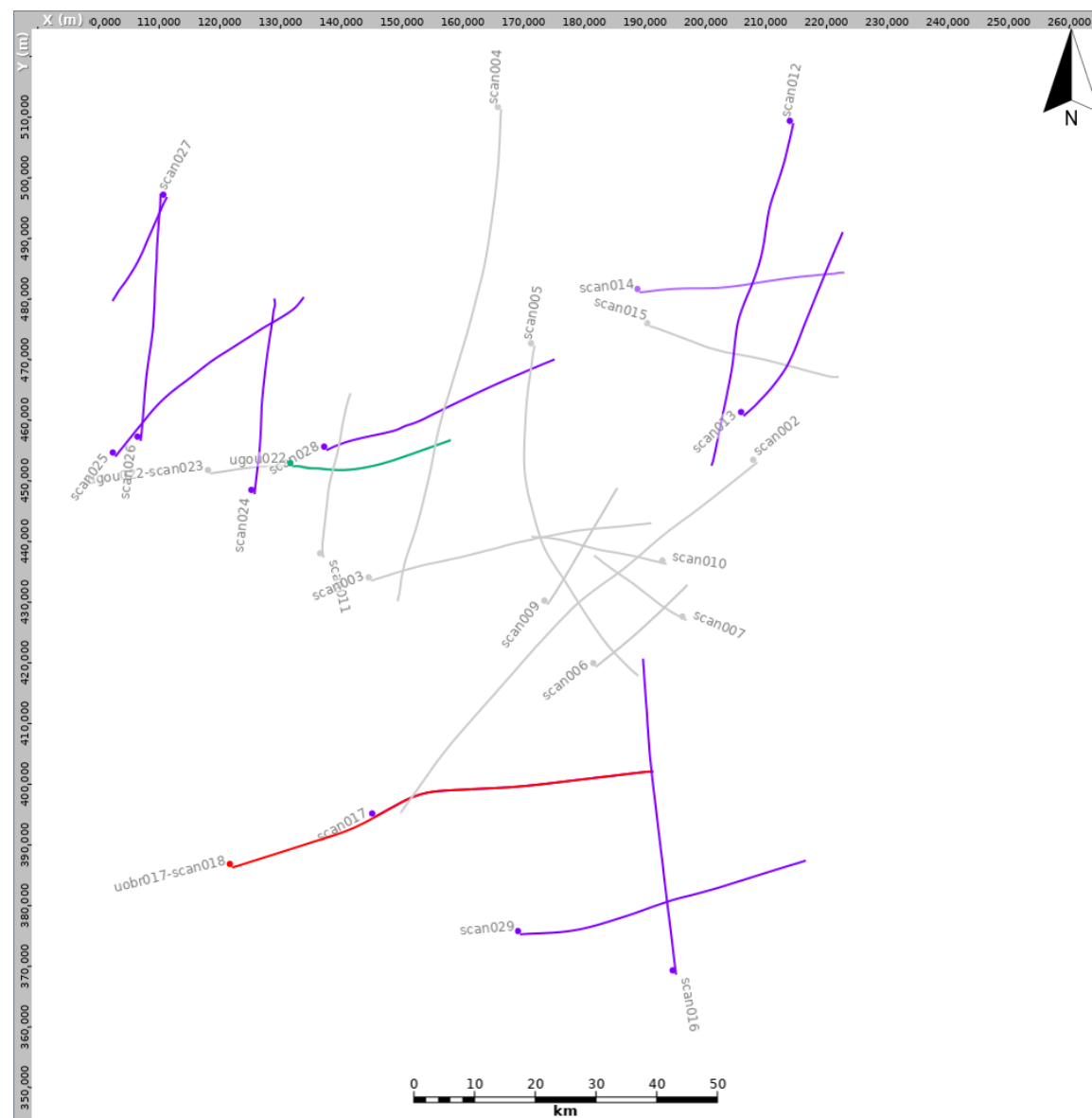
## Processing sequence

- Data reformat: SEGY to internal format
- Geometry: Crooked line with 2.5 m CDP interval
- Weak shots: 0-500 m offsets only
- Spherical divergence correction: T
- Geophone response correction:
- Refraction statics: Delay time using  $V_0=1000$  m/s  $V_R=1700$  m/s  $SRD=NAP$
- RAW STACK**
- Noise attenuation: +/-1250 m/s Weiner dip filter
- Edits: Kill invalid shots and receivers
- DENOISE 1**
- Noise attenuation: Despike
- Noise attenuation: Wavelet (D20) transform filter (muting the largest 10% of coefficients by 90% in scales 6-10)
- SCAC 1: Source and receiver components designed on NMO corrected gathers over 200-2200 ms
- Noise attenuation: TFDN
- DENOISE 2C**
- Inverse Q:  $Q=100$  phase and amplitude using 40 Hz reference frequency and 12 dB gain stabilisation

## Processing sequence (continued)

- DBS: Surface consistent with 160 ms operator length with 16 ms predictive gap  
0.1% white noise stabilisation - Design window: 200-3000 ms
- **DECONVOLUTION**
- Velocity analysis: 1 km interval
- Noise attenuation: 1.75 ms/tr (2857 m/s) dip filter and wavelet transform filter on shots
- **DENOISE 3**
- Residual statics: Surface consistent using MASTT
- Velocity analysis: 1 km interval
- Residual statics: Surface consistent using MASTT
- SCAC 2: Source and receiver components designed on NMO corrected gathers over 200-2200 ms
- Noise attenuation: Additional noise attenuation using TFDN on CDPs
- **INPUT TO MIGRATION**
- AGC: 500 ms (scaled stacks only)
- Stack:  $1/N$  ( $1/\sqrt{N}$  for scaled stacks) with 55° mute
- Static: Static to shift from floating to final datum (NAP) where applicable





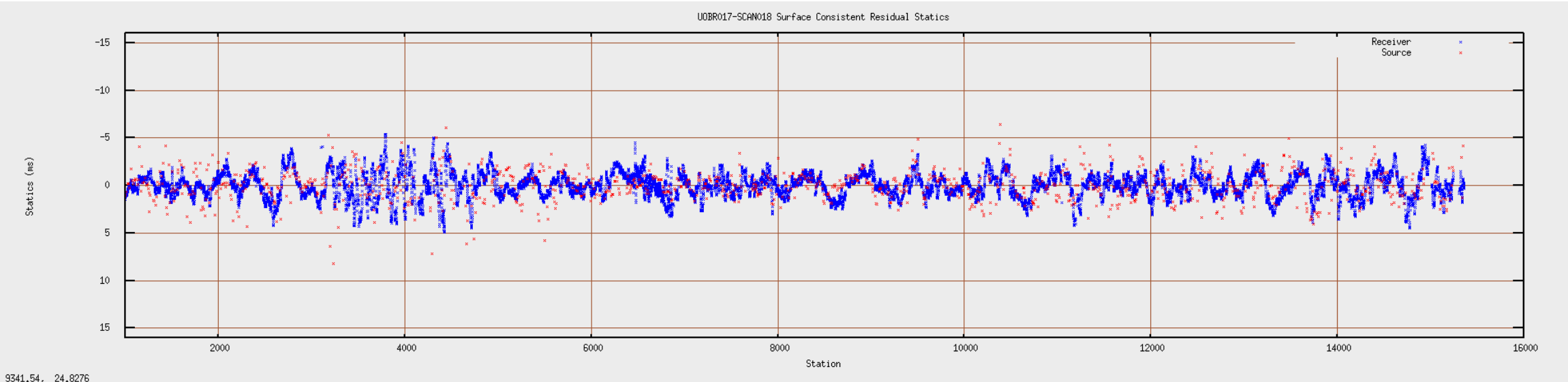
# UOBR017-SCAN018 surface consistent residual statics profiles



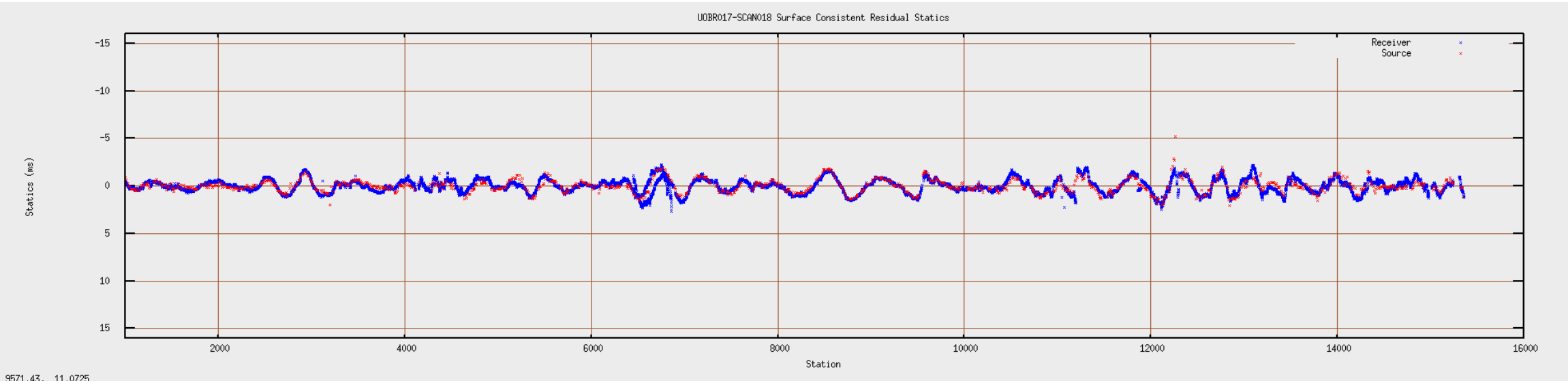
W

E

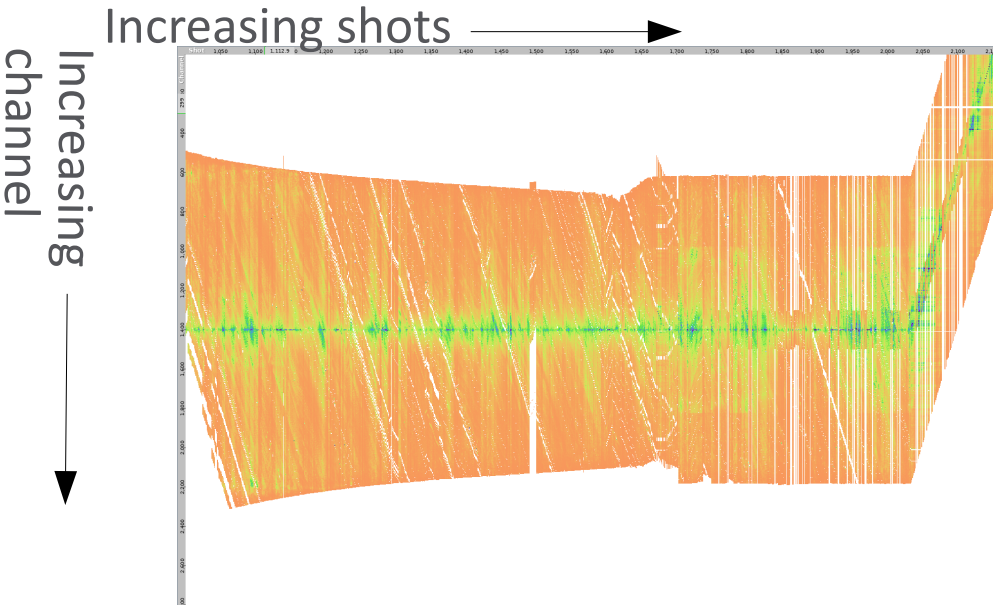
Pass 1



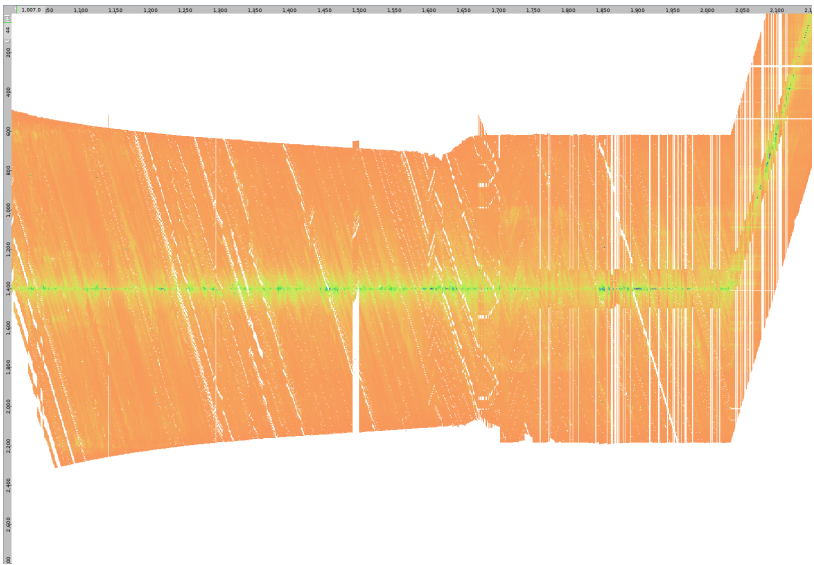
Pass 2



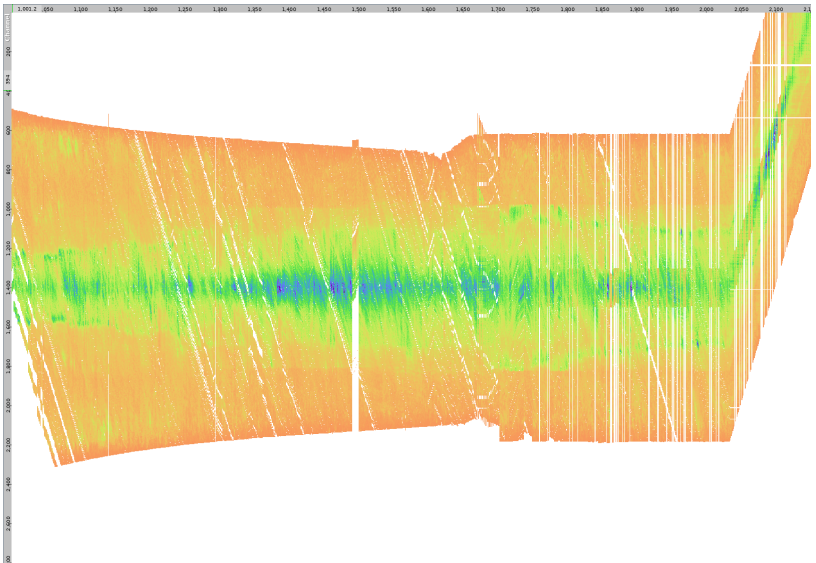
# UOBR017-SCAN018 RMS amplitude maps for surface consistent amplitude compensation



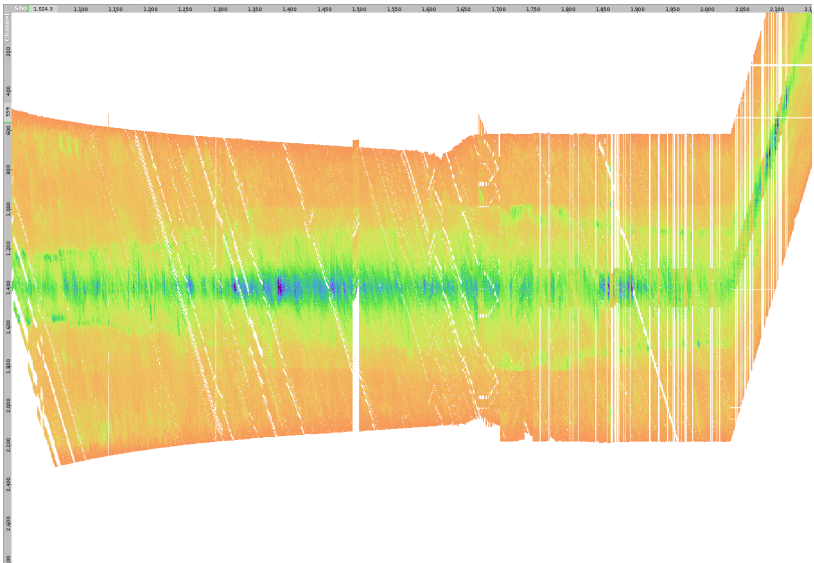
Pre SCAC1



Post SCAC1



Pre SCAC2

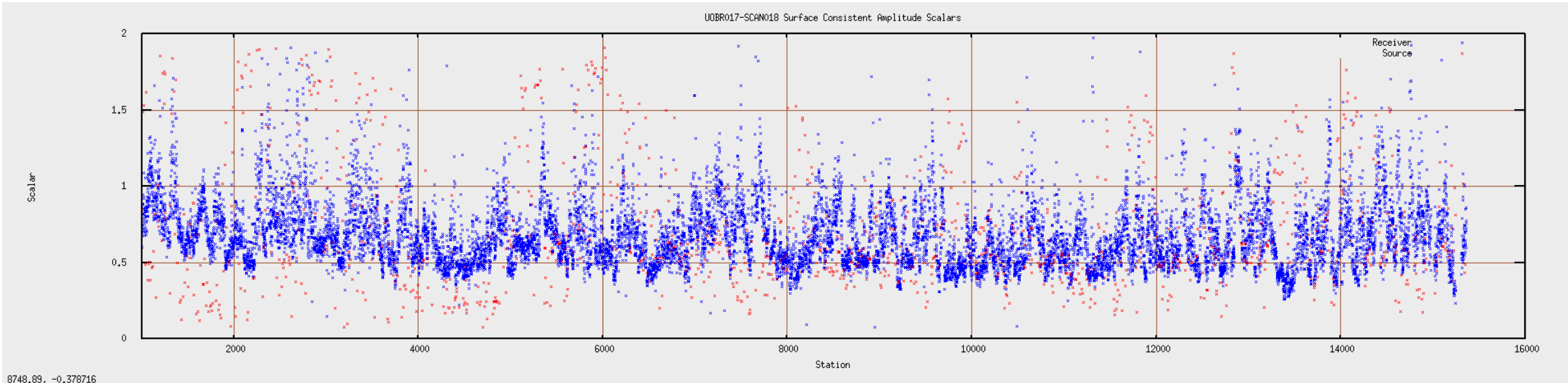


Post SCAC2

# UOBR017-SCAN018 surface consistent amplitude scalar profiles

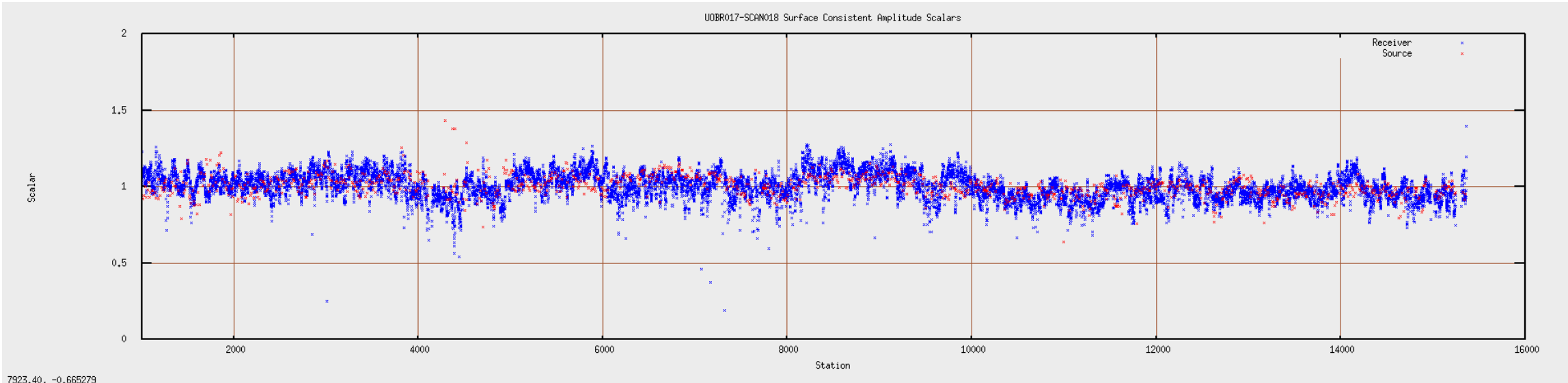


W  
Pass 1



E

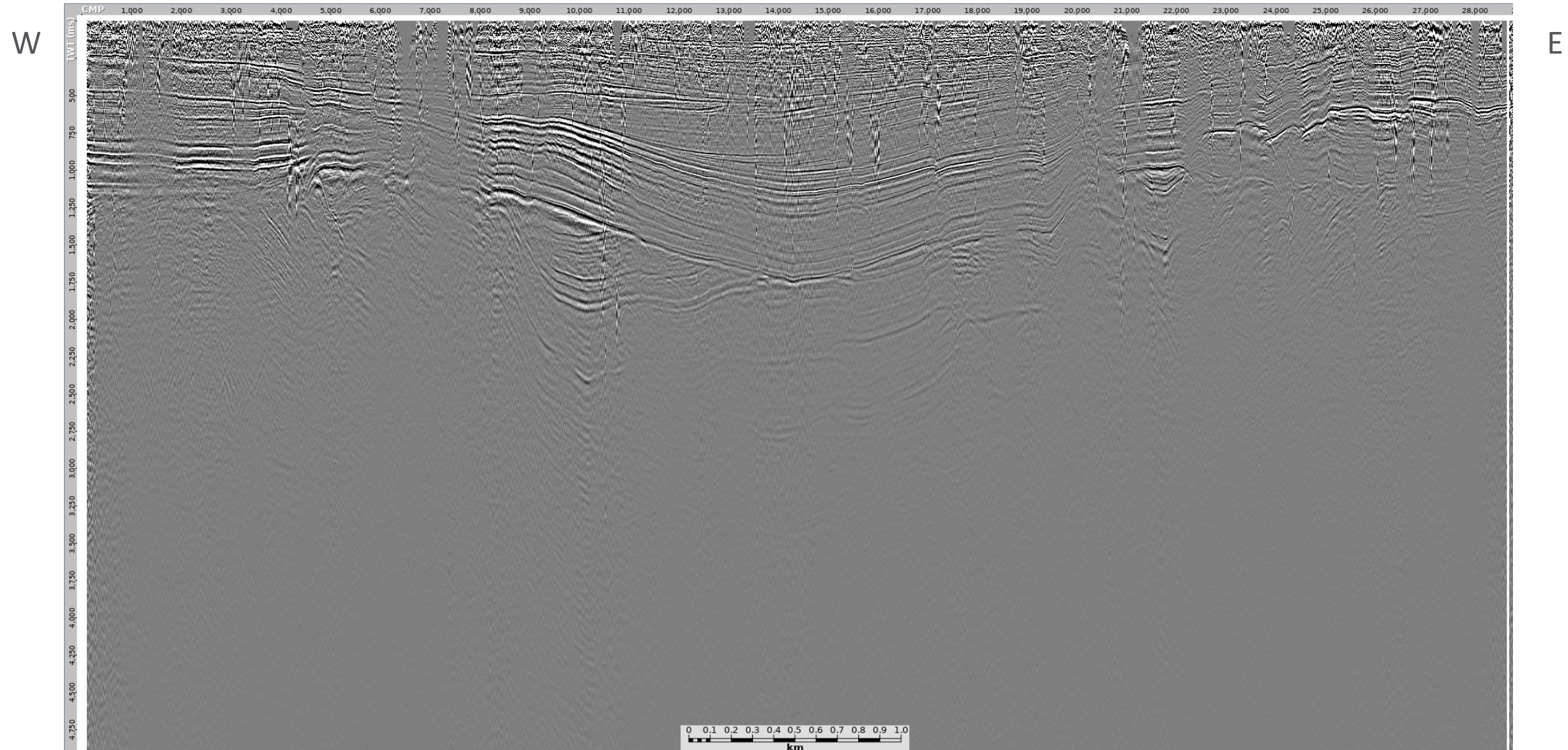
Pass 2





# UOBR017-SCAN018 stack before SCAC1

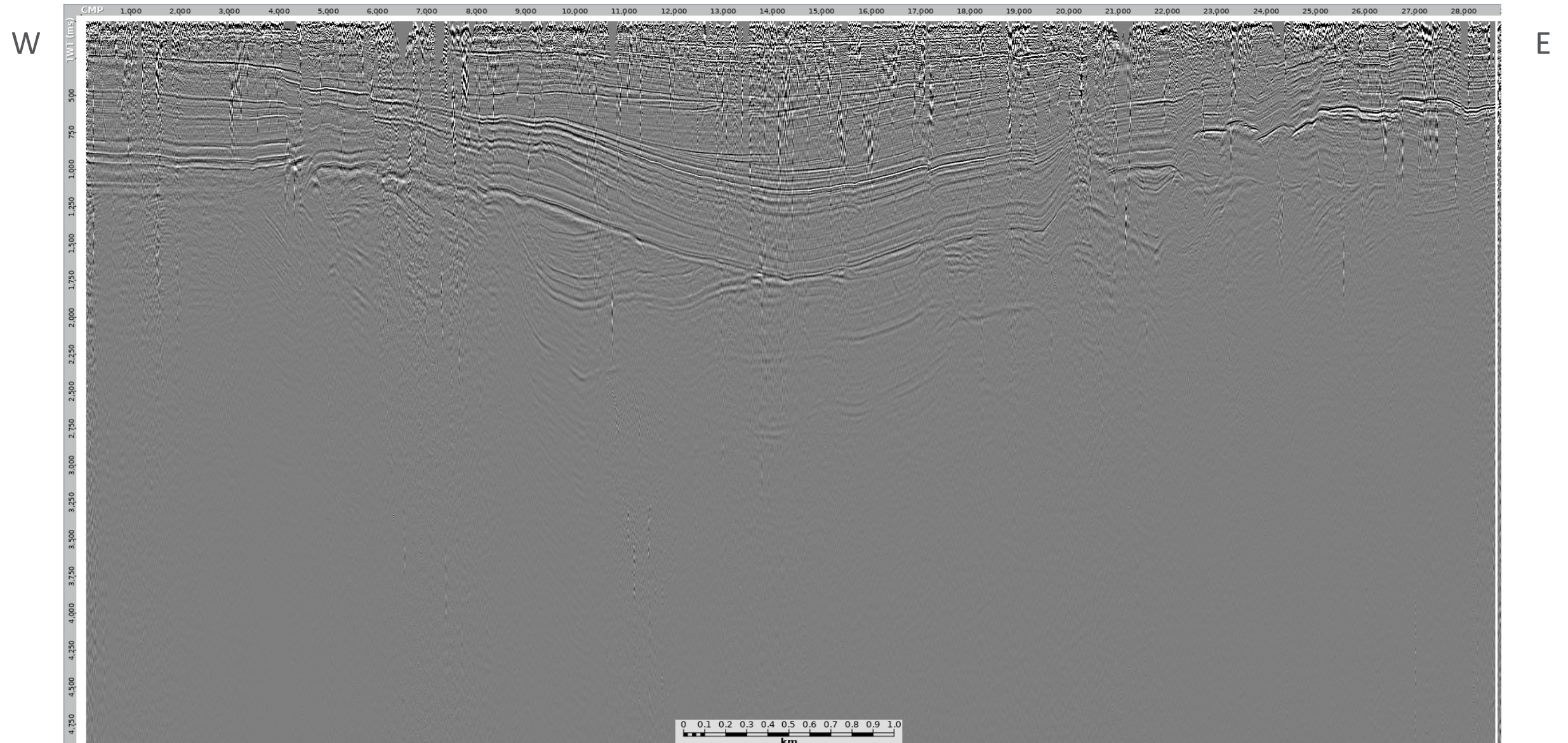
At final datum with 2-6-150-170 Hz filter



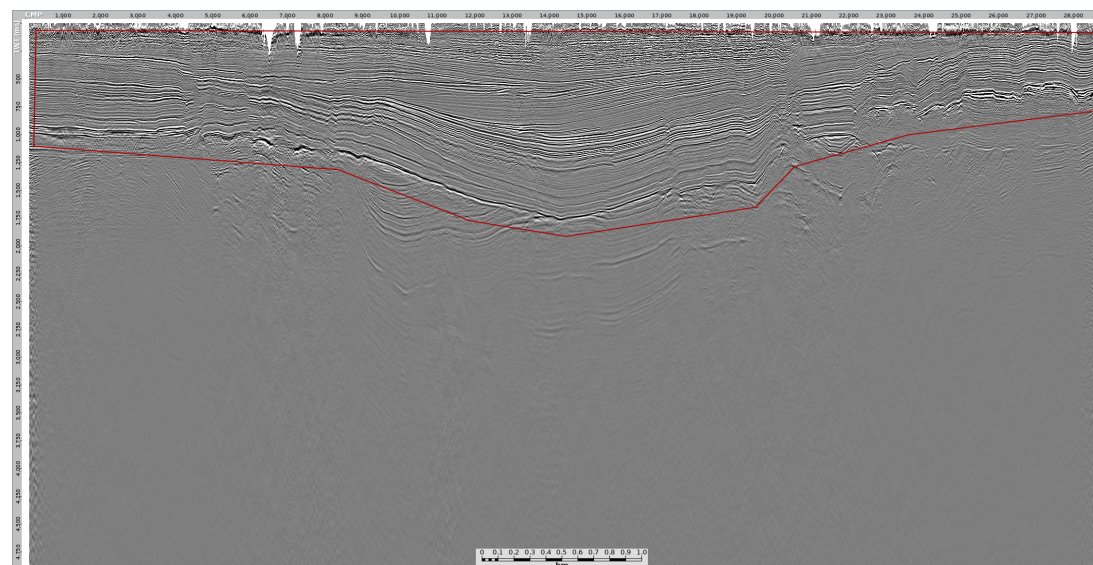


# UOBR017-SCAN018 stack after SCAC1

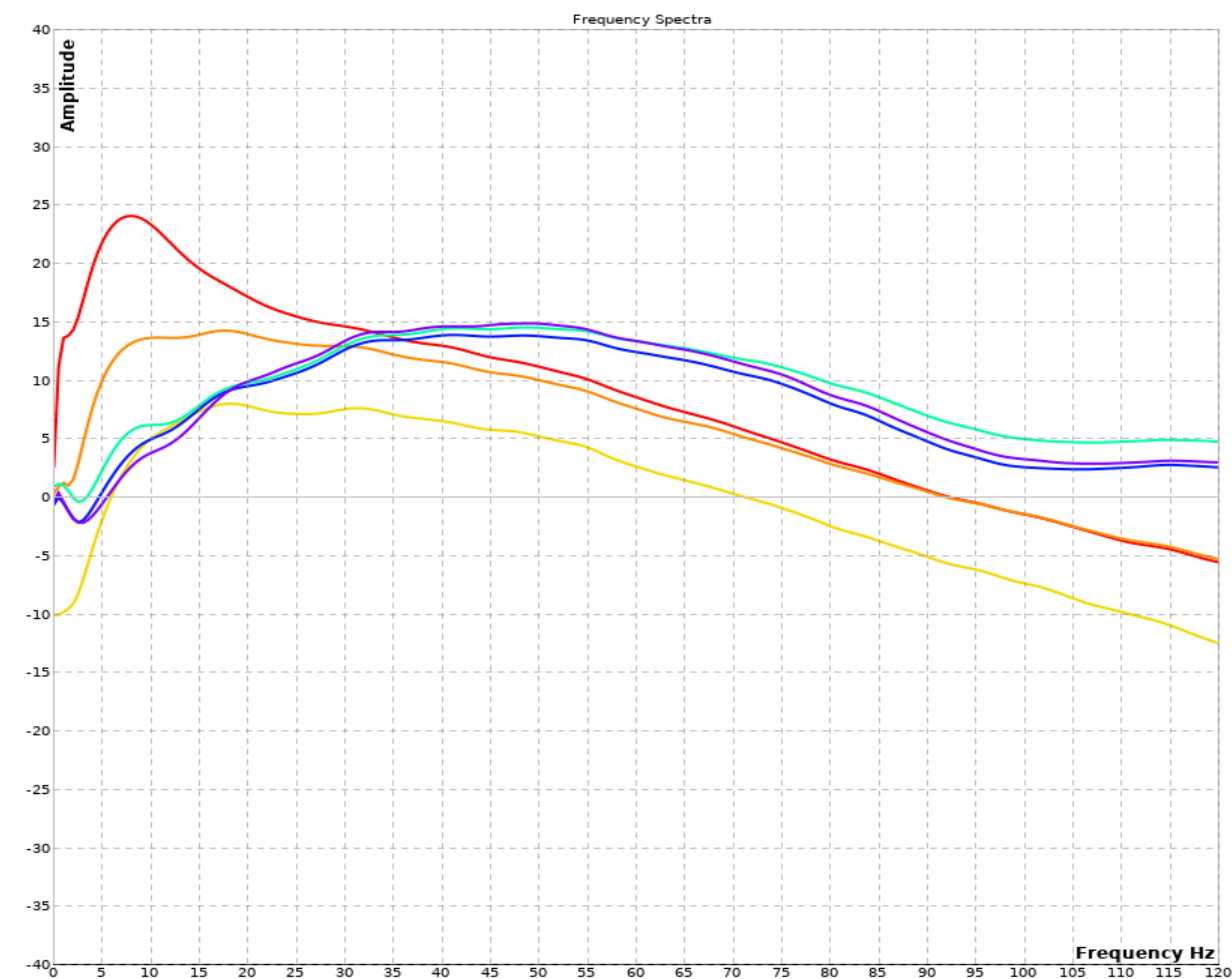
At final datum with 2-6-150-170 Hz filter



# UOBR017-SCAN018 shallow window amplitude spectra (dB)

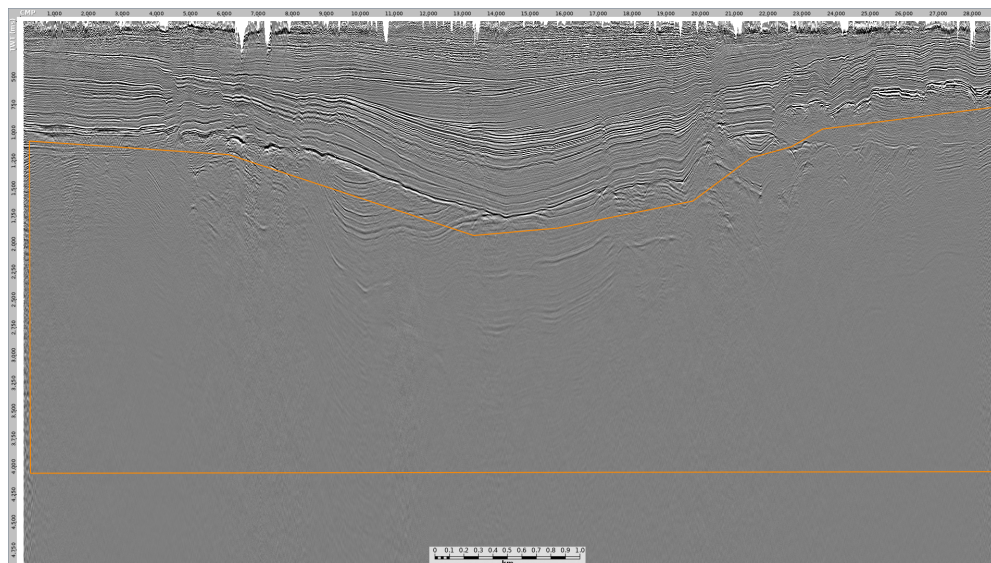


- Raw
- Denoise 1
- Denoise 2c
- Deconvolution
- Denoise 3
- Input to migration

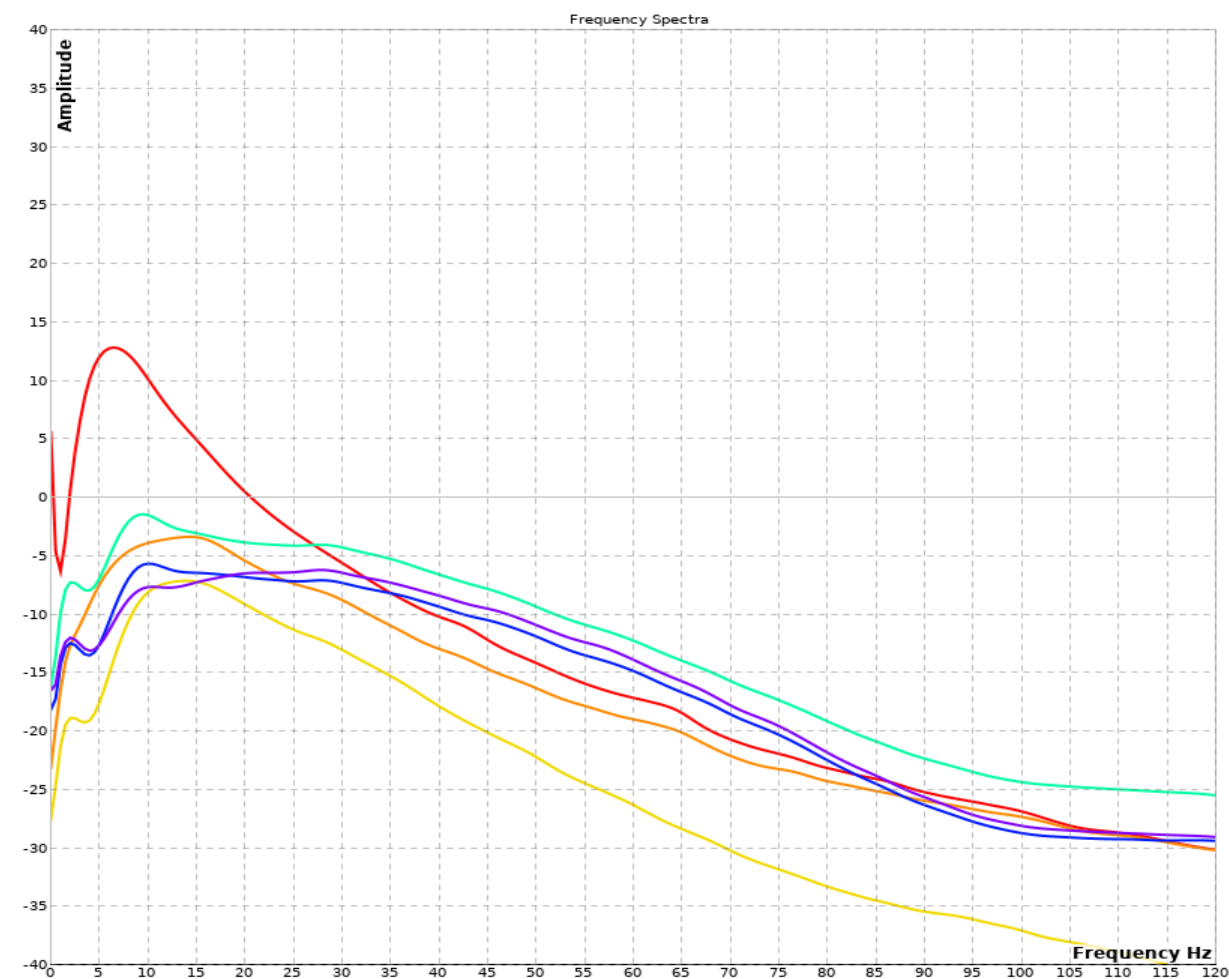




# UOBR017-SCAN018 deep window amplitude spectra (dB)

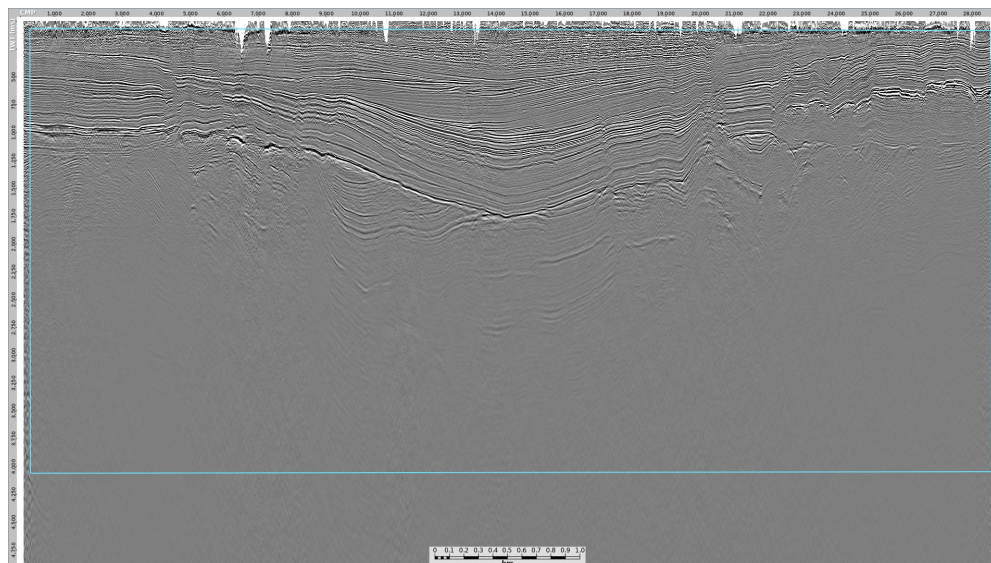


- Raw
- Denoise 1
- Denoise 2c
- Deconvolution
- Denoise 3
- Input to migration

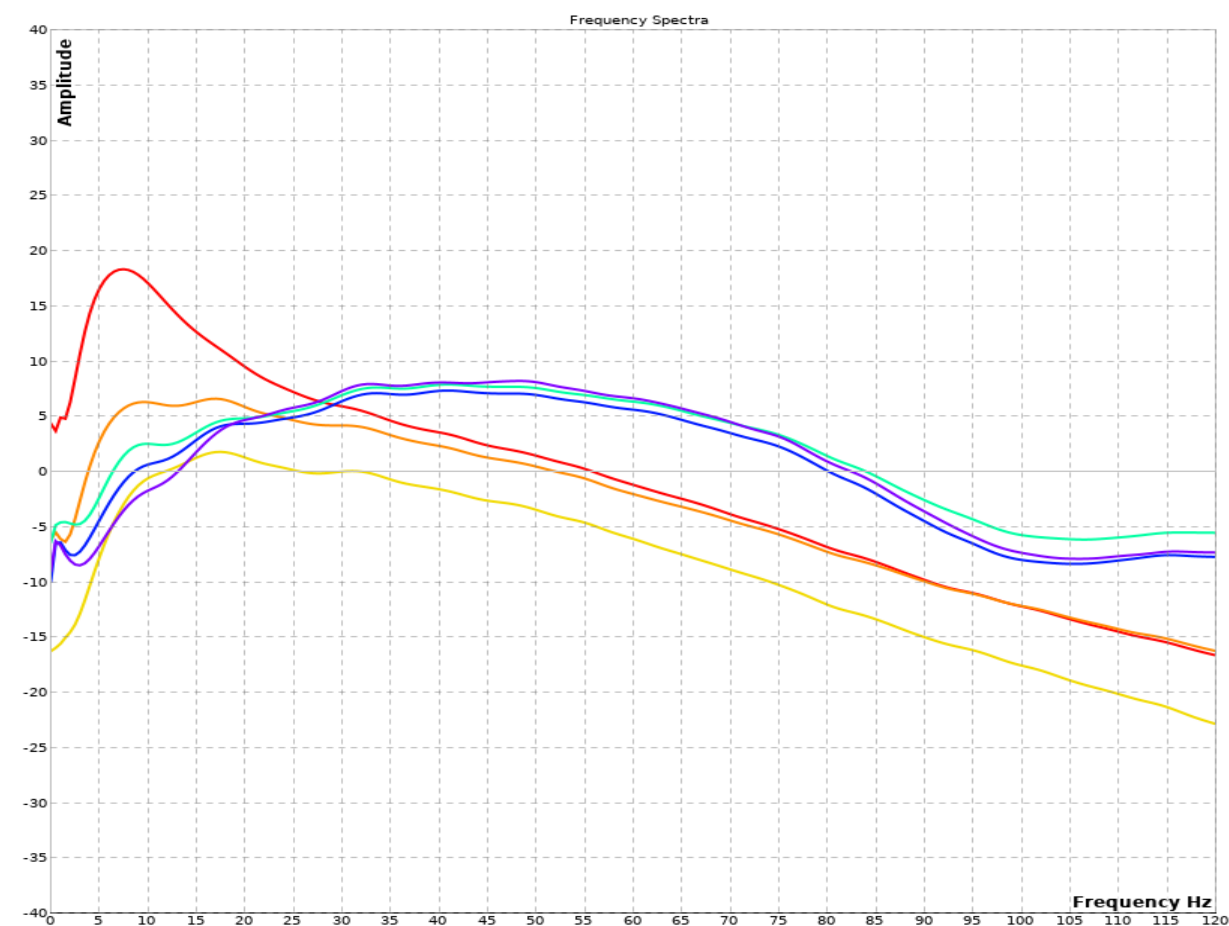




# UOBR017-SCAN018 long window amplitude spectra (dB)



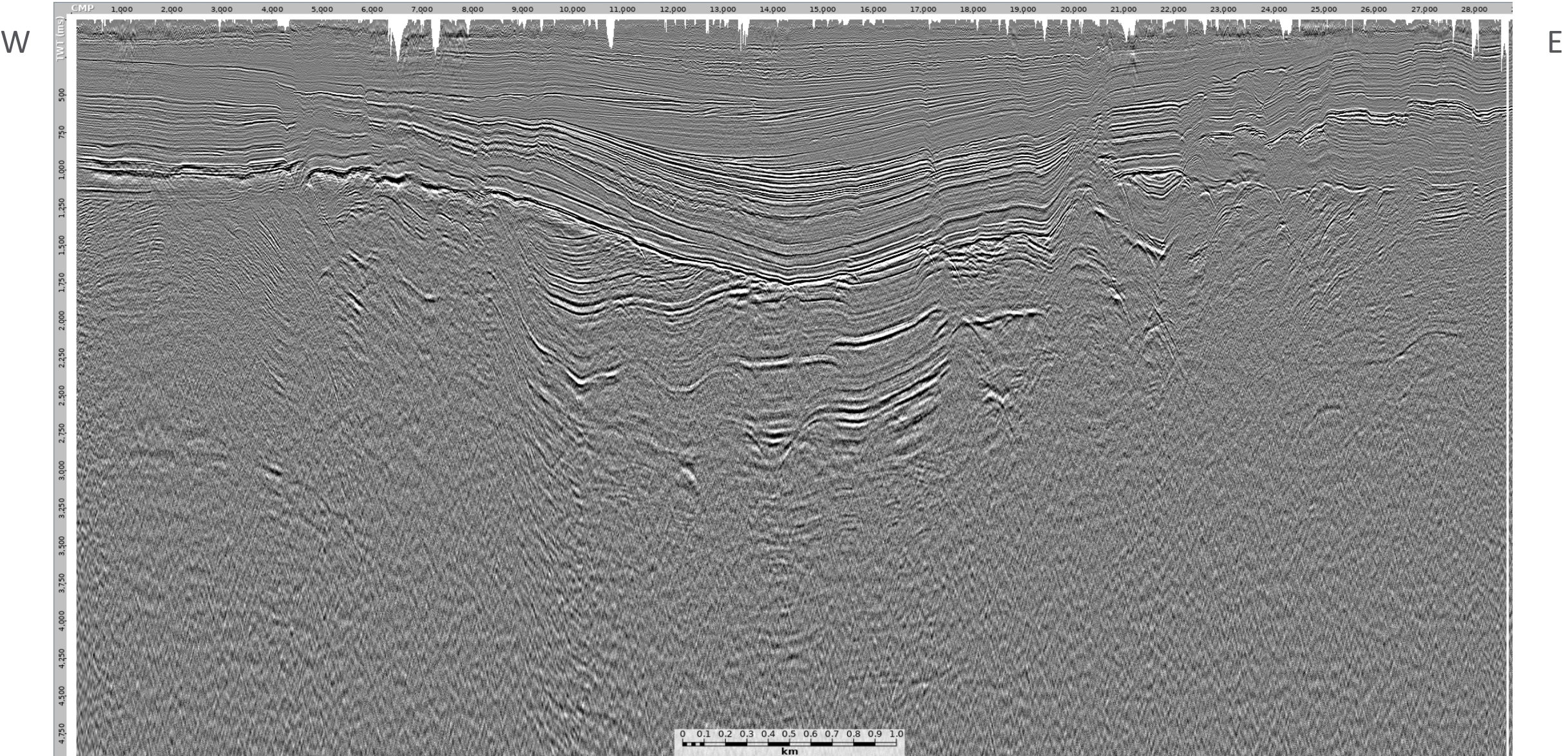
- Raw —●
- Denoise 1 —●
- Denoise 2c —●
- Deconvolution —●
- Denoise 3 —●
- Input to migration —●





# UOBR017-SCAN018 initial velocity stack

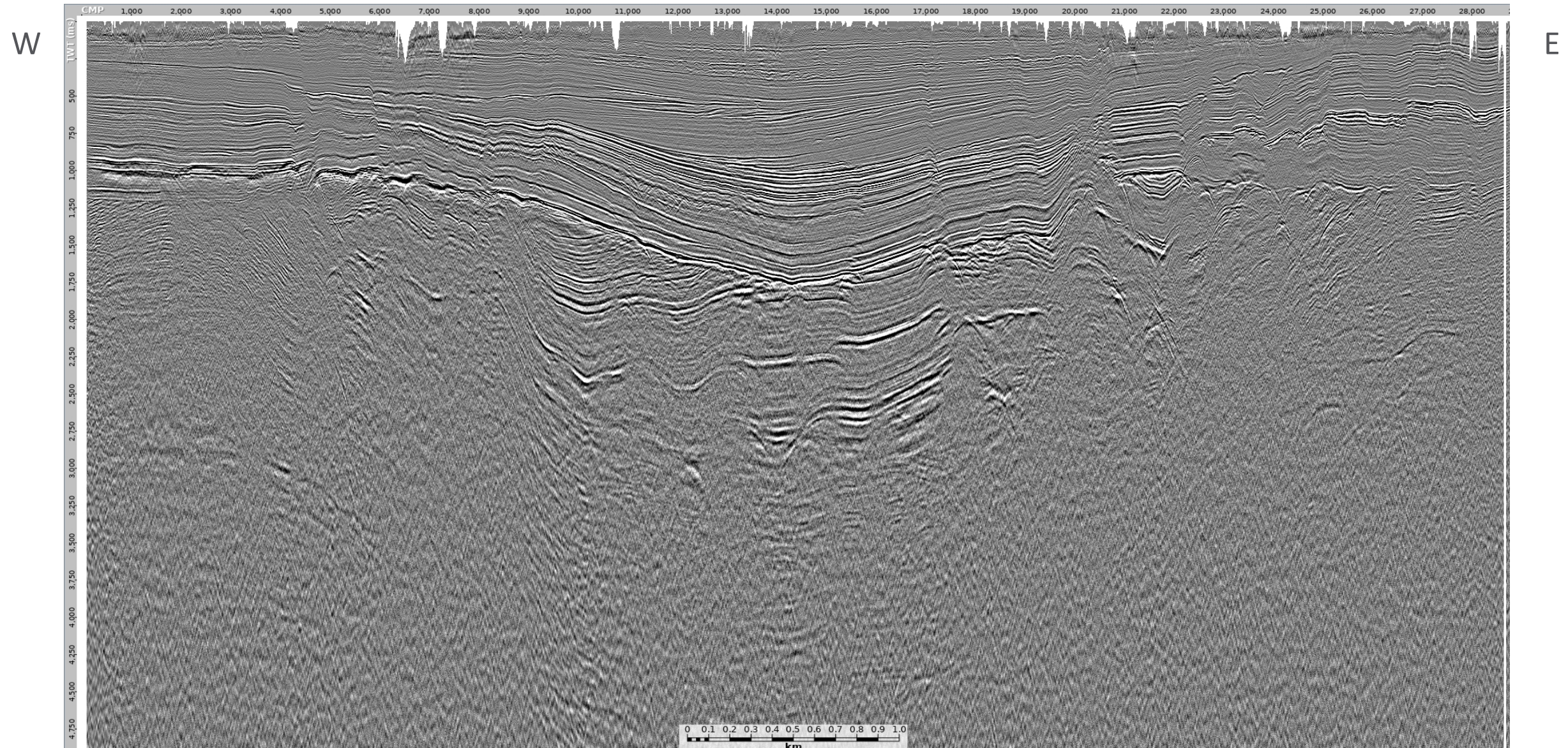
At final datum with 2-6-150-170 Hz filter





# UOBR017-SCAN018 initial velocity and residual statics stack

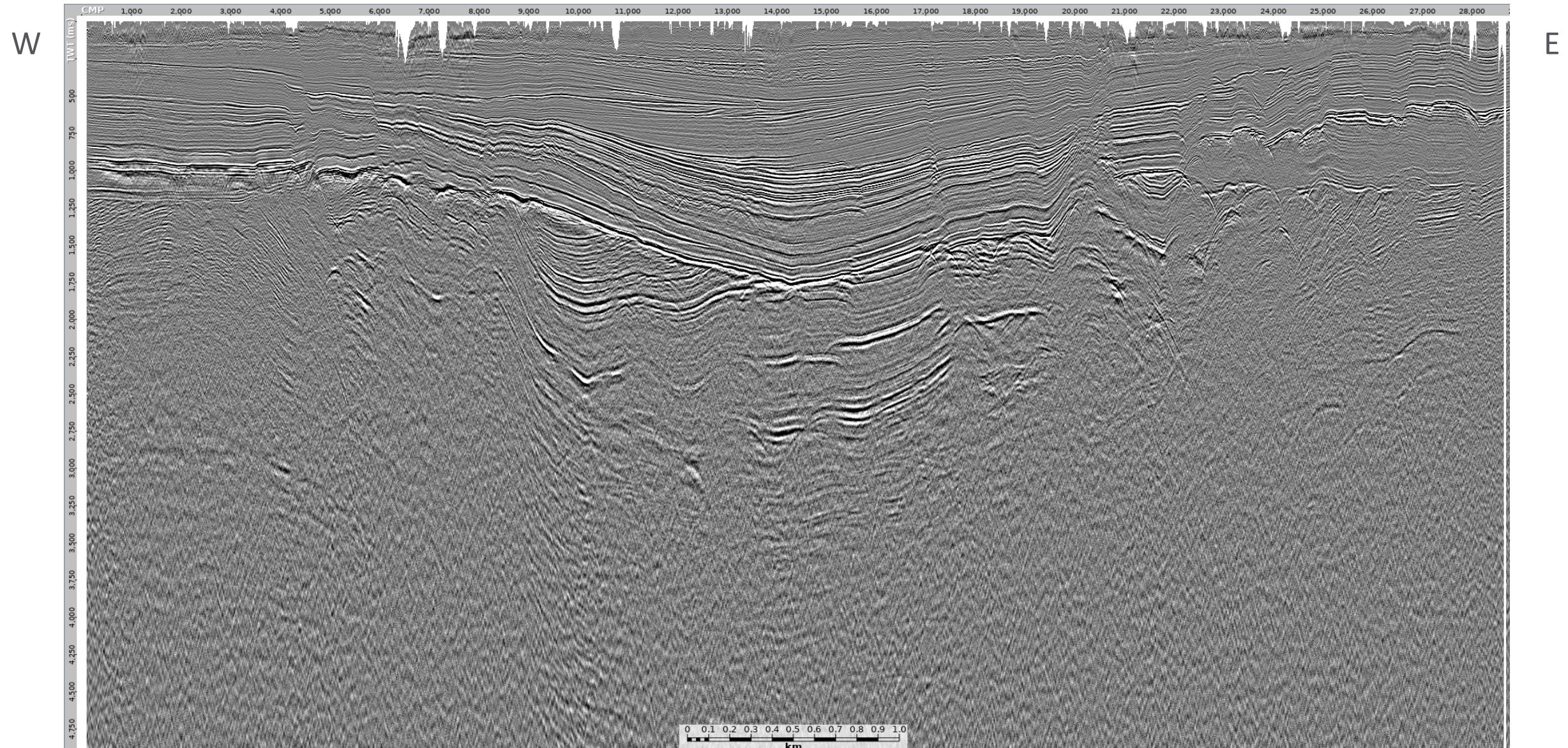
At final datum with 2-6-150-170 Hz filter





# UOBR017-SCAN018 2nd pass velocity AGC stack

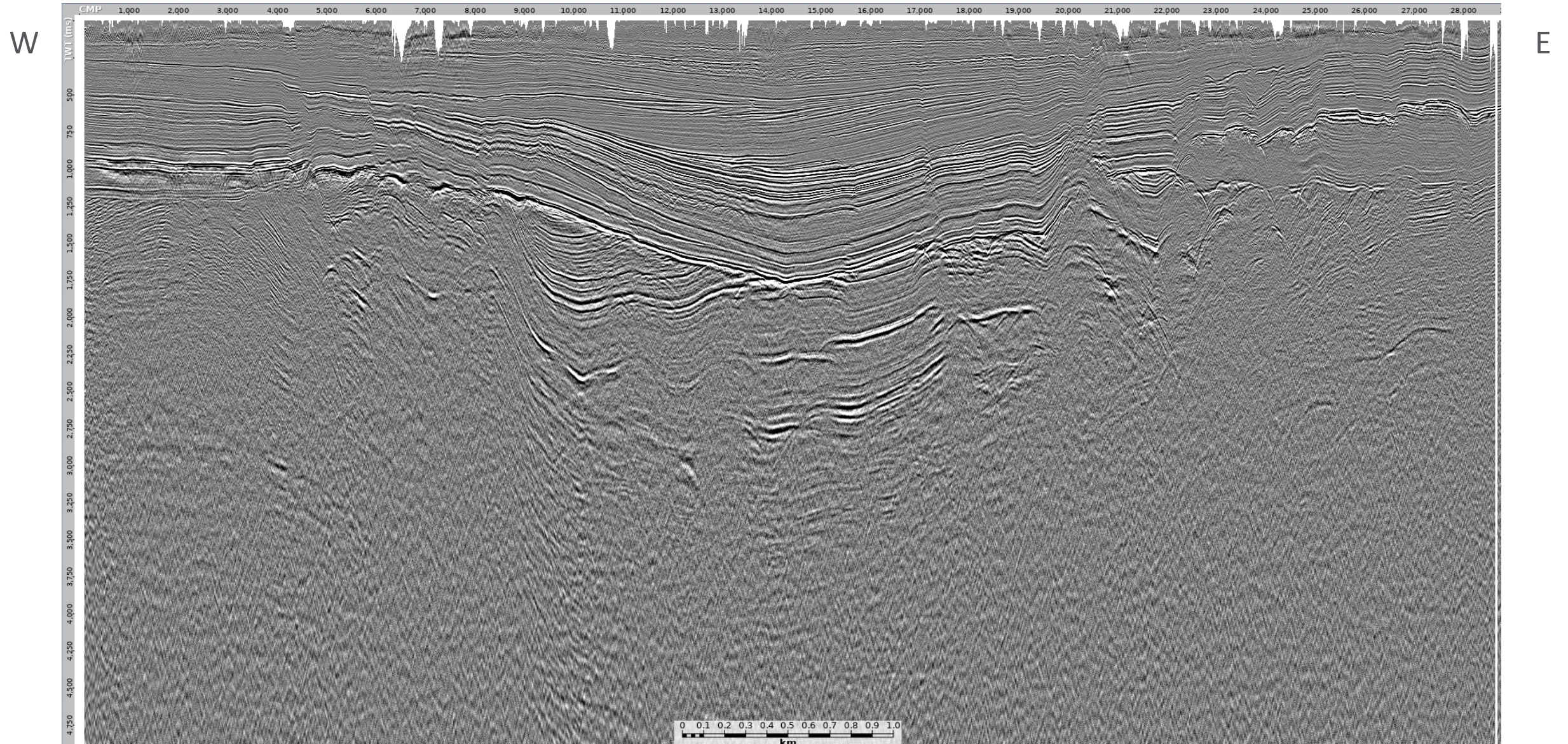
At final datum with 2-6-150-170 Hz filter





# UOBR017-SCAN018 2nd pass velocity AGC stack with second pass of residual statics

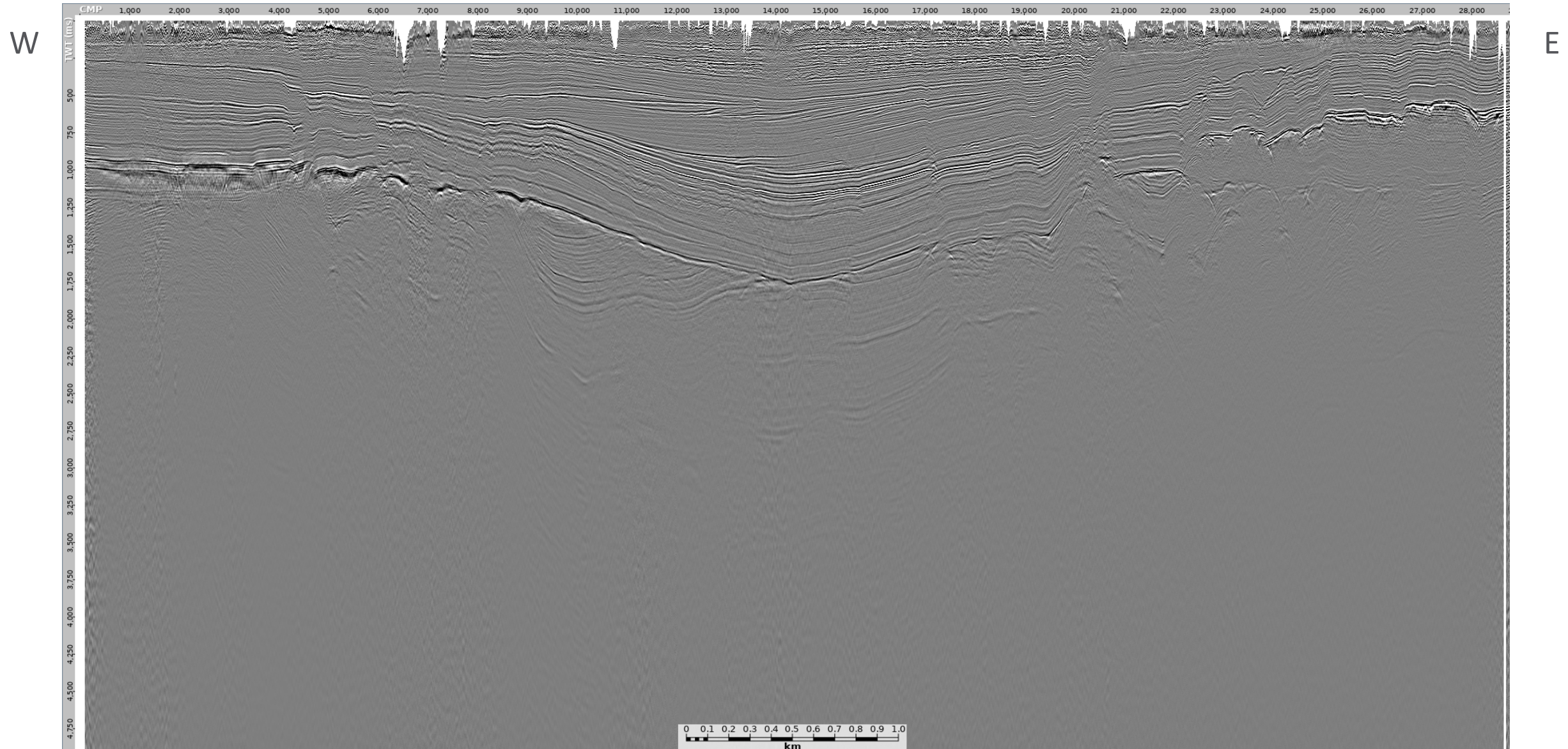
At final datum with 2-6-150-170 Hz filter





# UOBR017-SCAN018 2nd pass velocity stack with second pass of residual statics

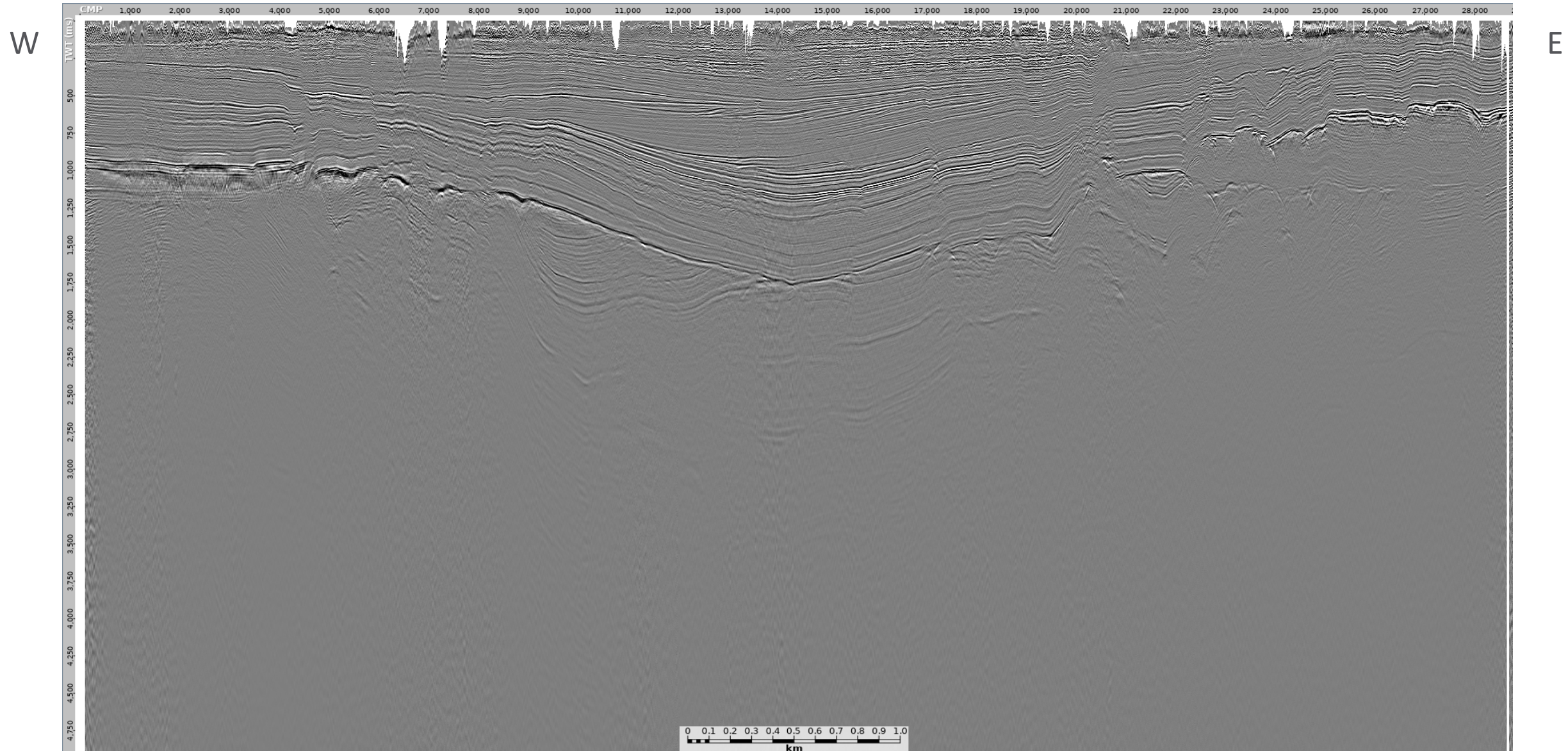
At final datum with 2-6-150-170 Hz filter





# UOBR017-SCAN018 2nd pass velocity stack with second pass of residual statics and second pass of SCAC

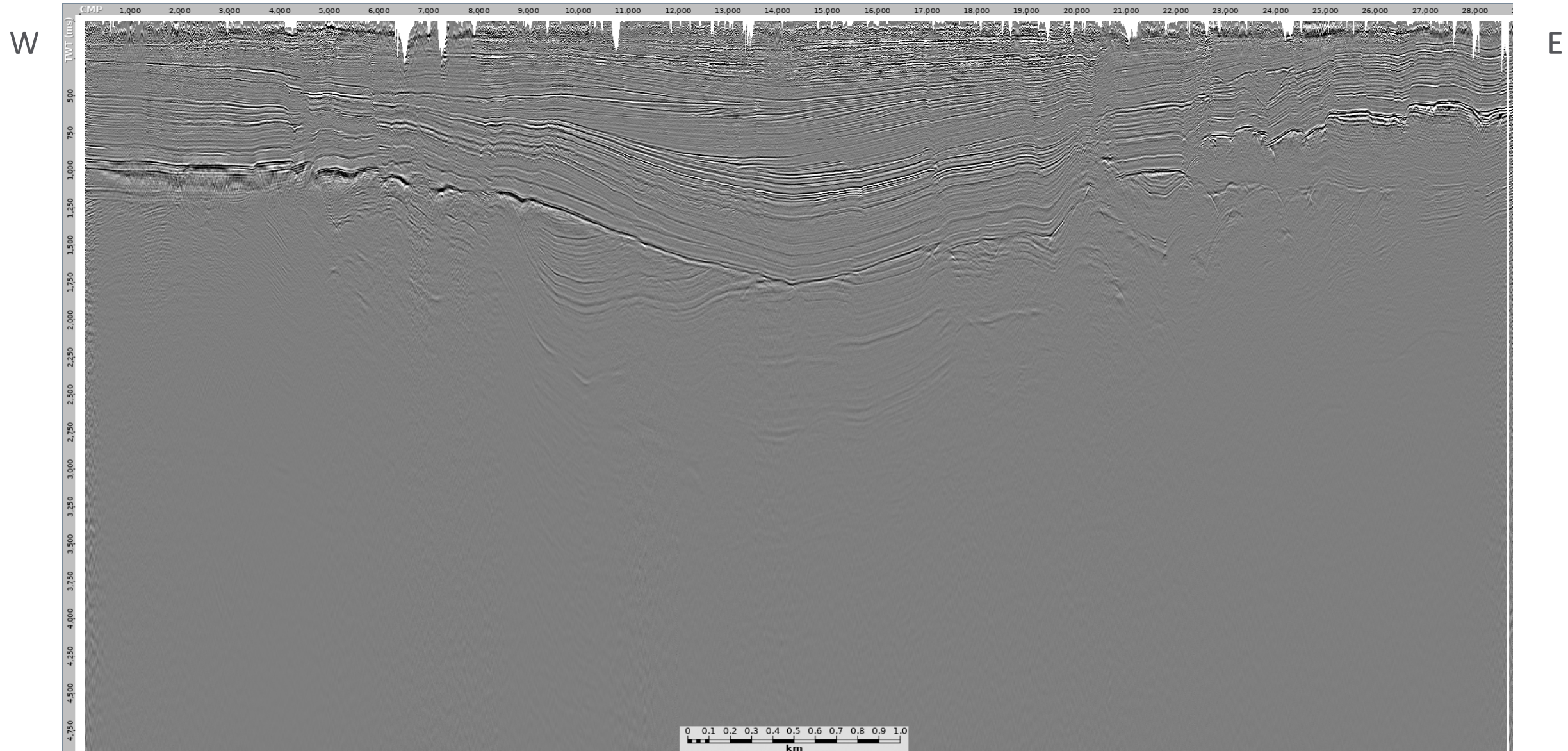
At final datum with 2-6-150-170 Hz filter





# UOBR017-SCAN018 2nd pass velocity stack with second pass of residual statics, second pass of SCAC and TFDN on CDPs

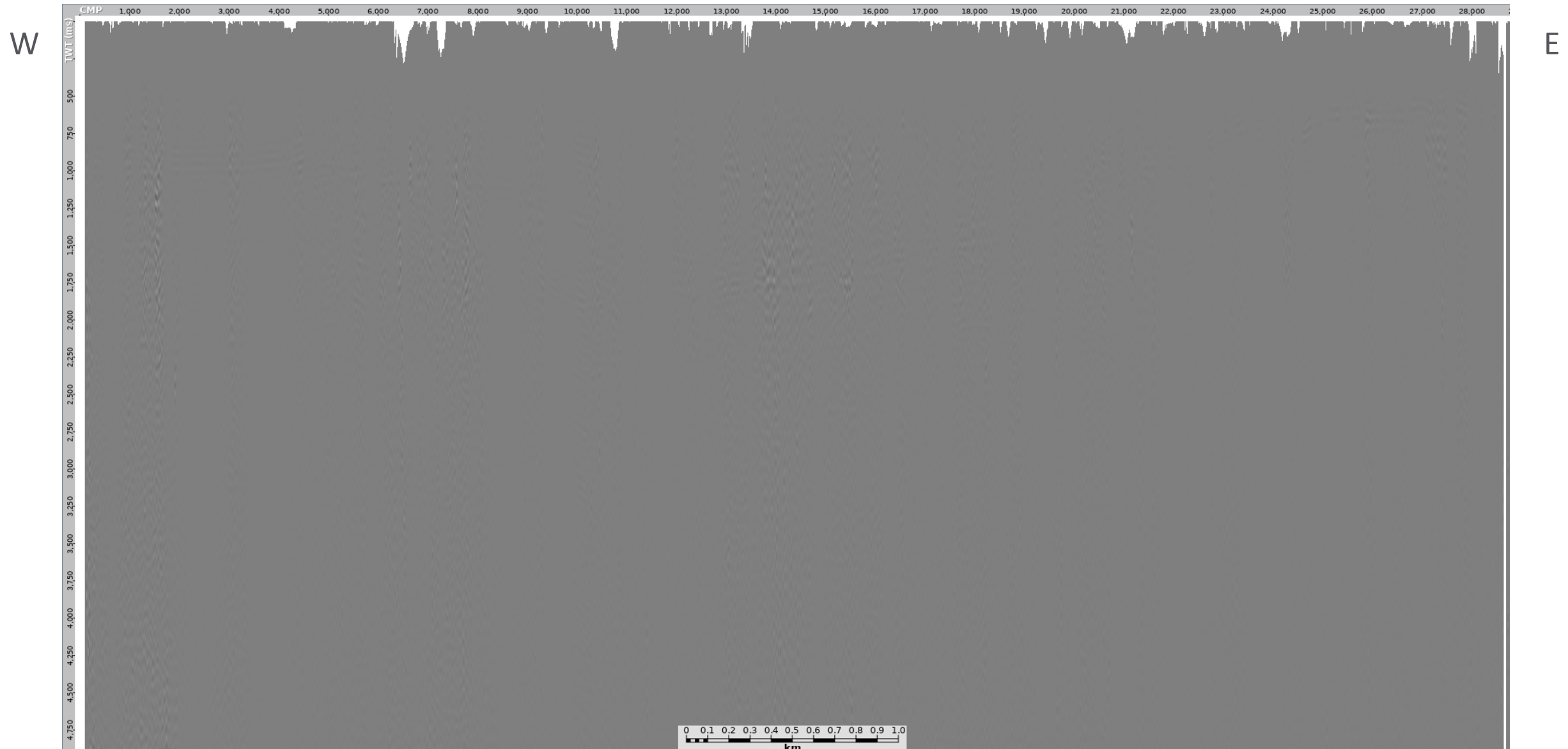
At final datum with 2-6-150-170 Hz filter





# UOBR017-SCAN018 stack difference with TFDN on CDPs

At final datum with 2-6-150-170 Hz filter



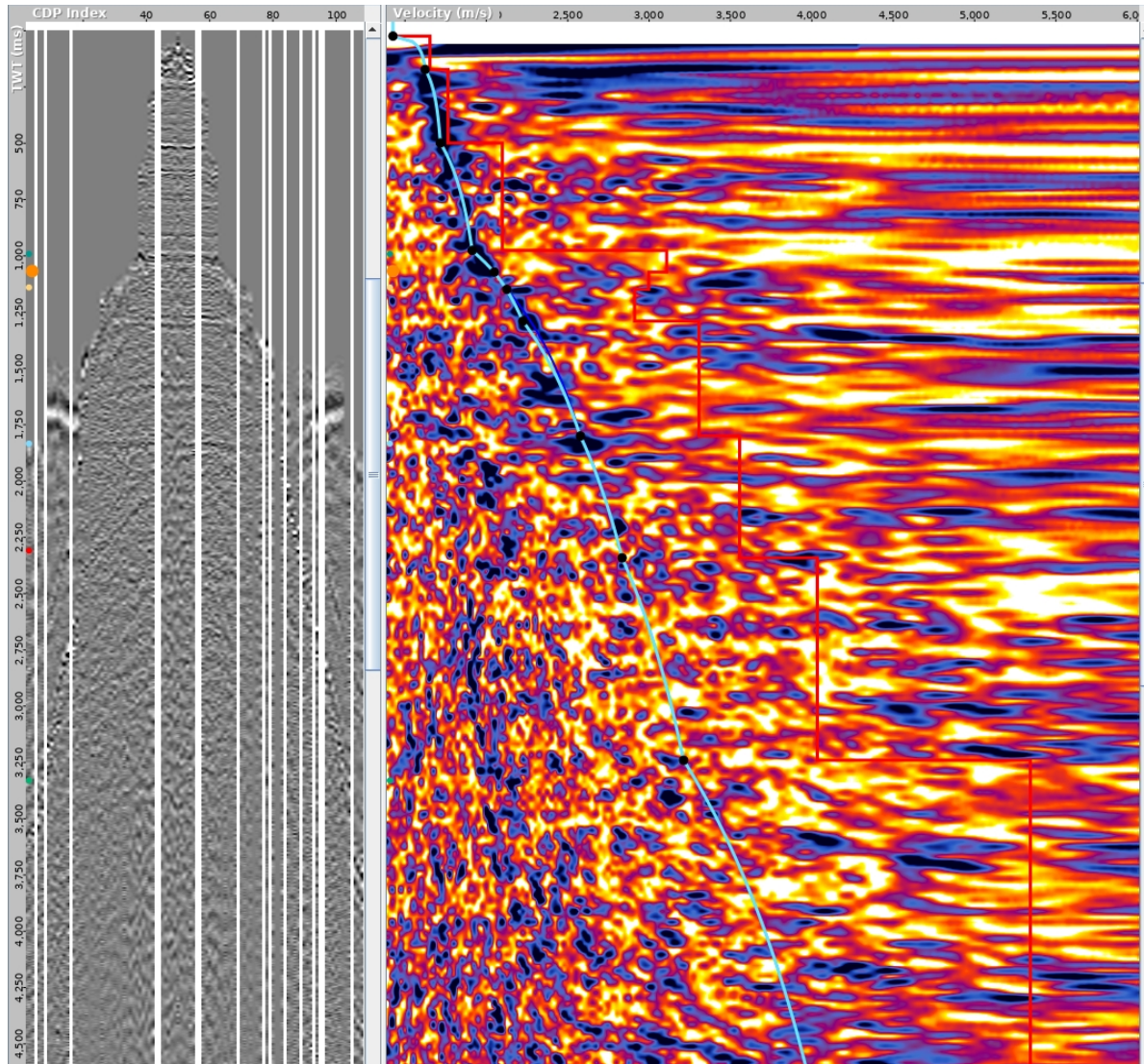


# UOBR017-SCAN018 velocity analyses

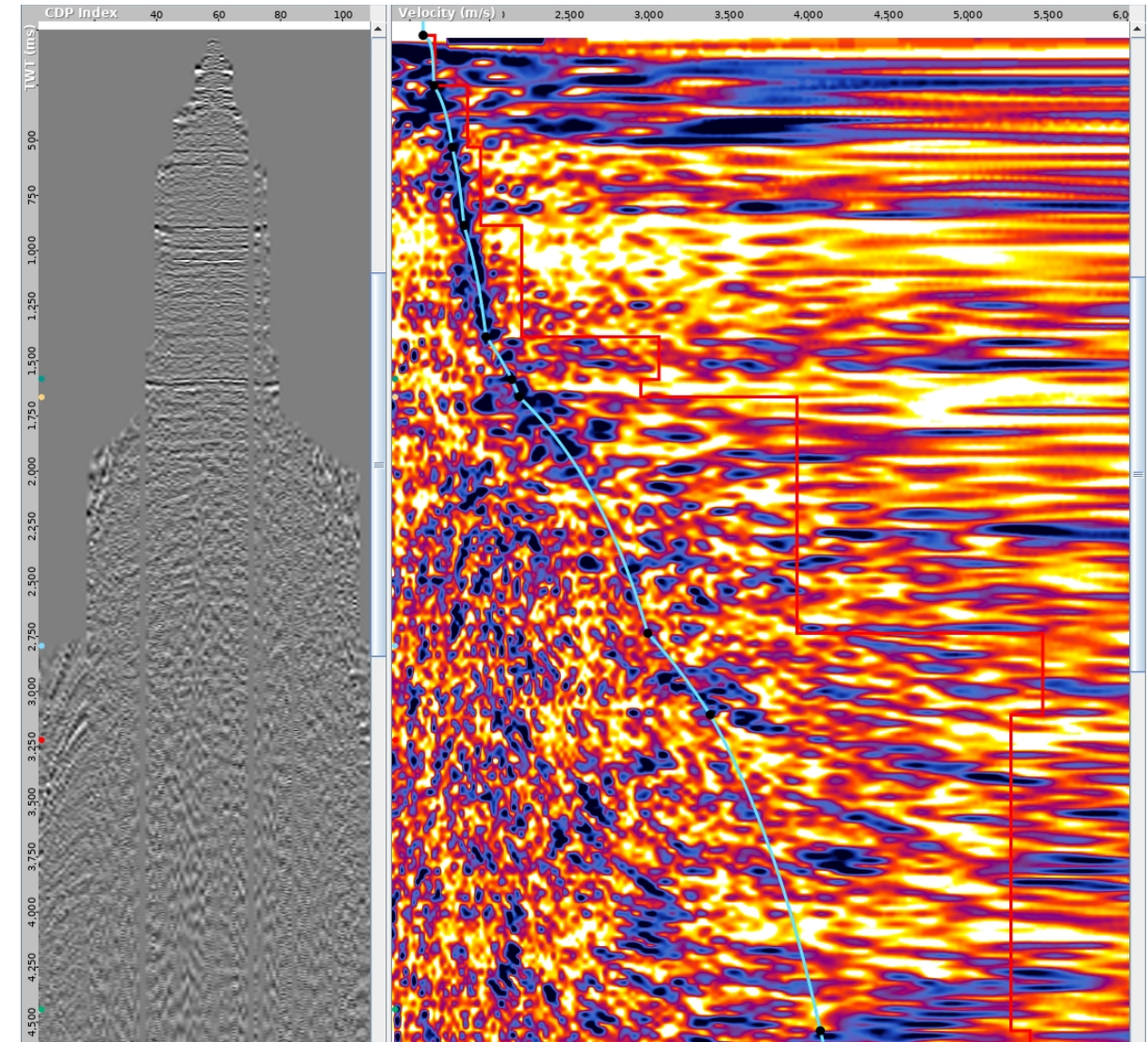
At floating datum



CDP 5600



CDP 12400



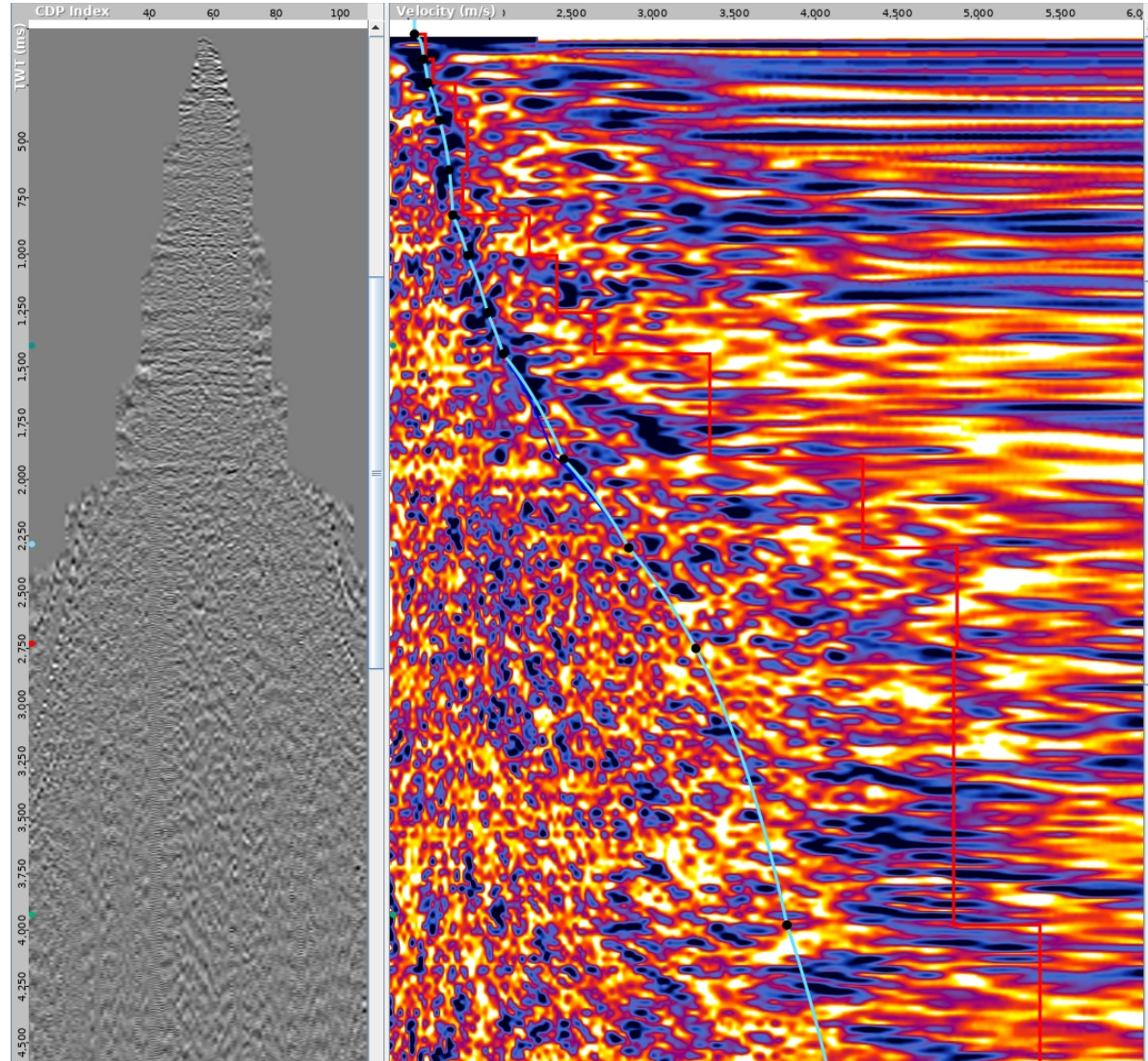
White = Picked function

Blue = Initial function

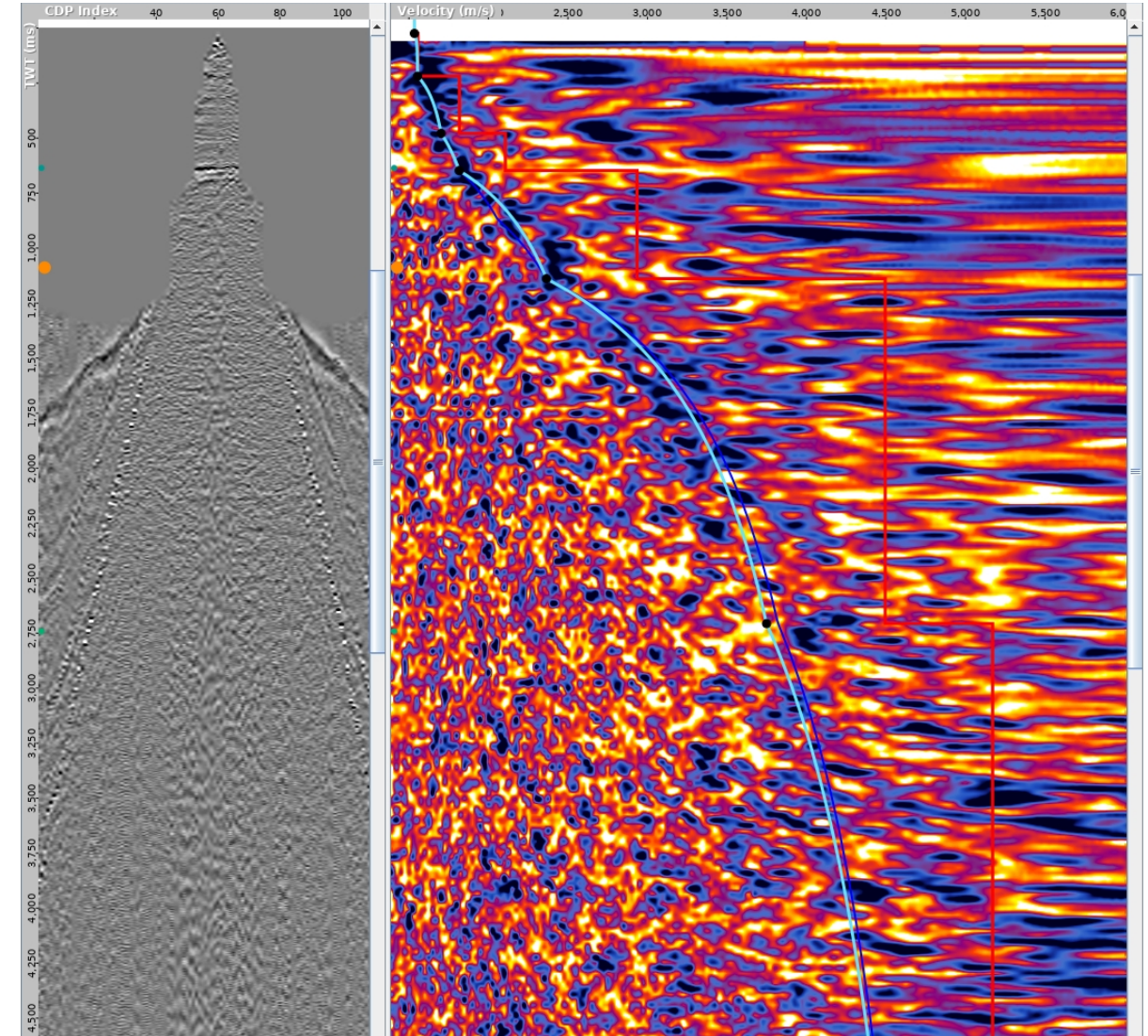
Red = Interval velocity



CDP 19200



CDP 26000



White = Picked function

Blue = Initial function

Red = Interval velocity



# UOBR017-SCAN018 stack with 2nd pass velocities and residual statics and interval velocity overlay

At floating datum with supplied horizons annotated

