



# Radon Demultiple

## NZ 3D Processing

19 May 2021

[cgg.com](http://cgg.com)



INSTITUTE FOR GEOPHYSICS



Passion for Geoscience

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
13. Residual Bubble Removal
14. Source Sensor Datum Correction
15. Shallow Water Demultiple
16. Surface Related Multiple Elimination (3D SRME)
17. Simultaneous Subtraction of MWD & SRME
18. Residual Linear Noise Attenuation (residual LNA)
19. Trace Regularization & Interpolation
20. Velocity Analysis
21. Radon Demultiple
22. Footprint Removal
23. Diffracted Multiple Removal
24. Common Offset Denoise
25. Q Analysis and Compensation
26. Final TTI Kirchhoff Migration
27. Convert from Depth to Time Domain
28. High Density Automatically Velocity Analysis
29. Radon Demultiple

- **Objective:**

To remove residual multiples on TTI Kirchhoff Migration gathers.

- **Procedure:**

The method separates primaries and multiples according to parabolas.

Start time: WBT + 600ms

Transform range:  $-2000\text{ms} < dt < 3000\text{ms}$  at offset 5950.

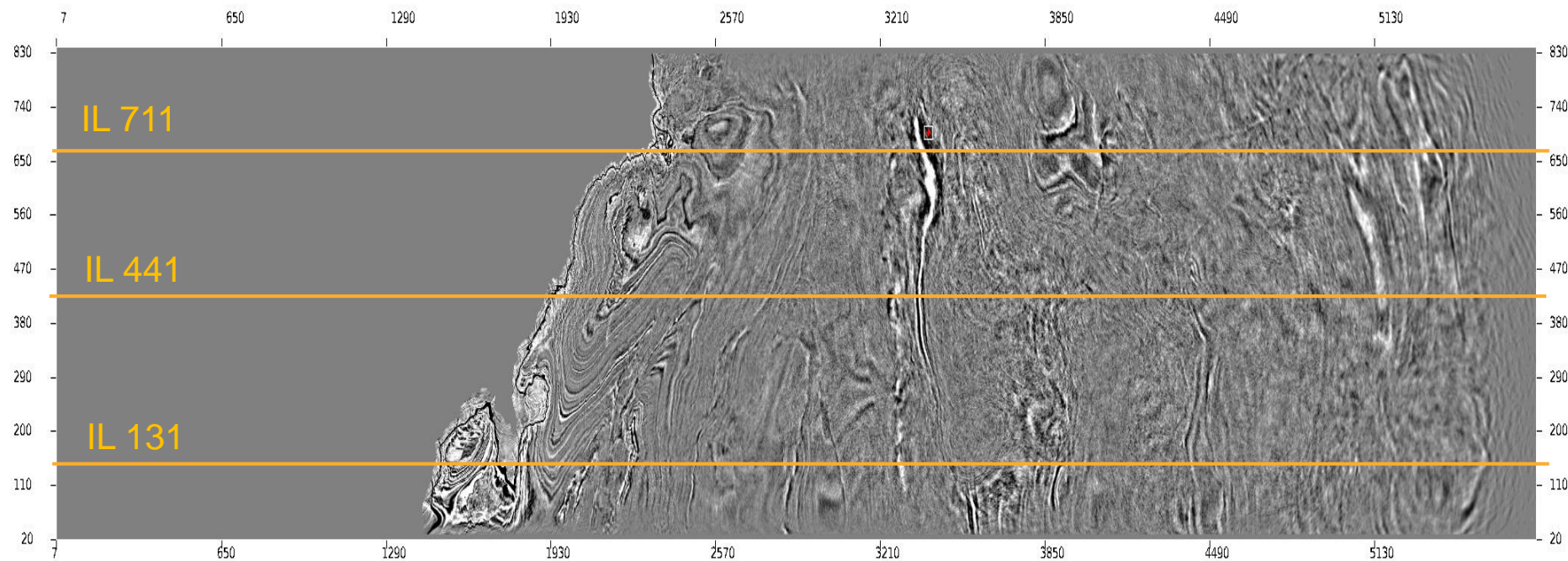
- **Display:**

Time CDP Gathers, depth stack.

Primary protection range (ms)			
Time	dtmin	dmax	Reference Offset
WBT + 1000	-1900 ms	500 ms	5950
WBT + 3000	-1900 ms	200 ms	5950
WBT + 5000	-1900 ms	150 ms	5950

- **Observation & Recommendation:**

Residual multiple energy is attenuated on CDP gathers and primaries are more obvious. It's recommended to apply for production.



Subline



Crossline

# IL 131

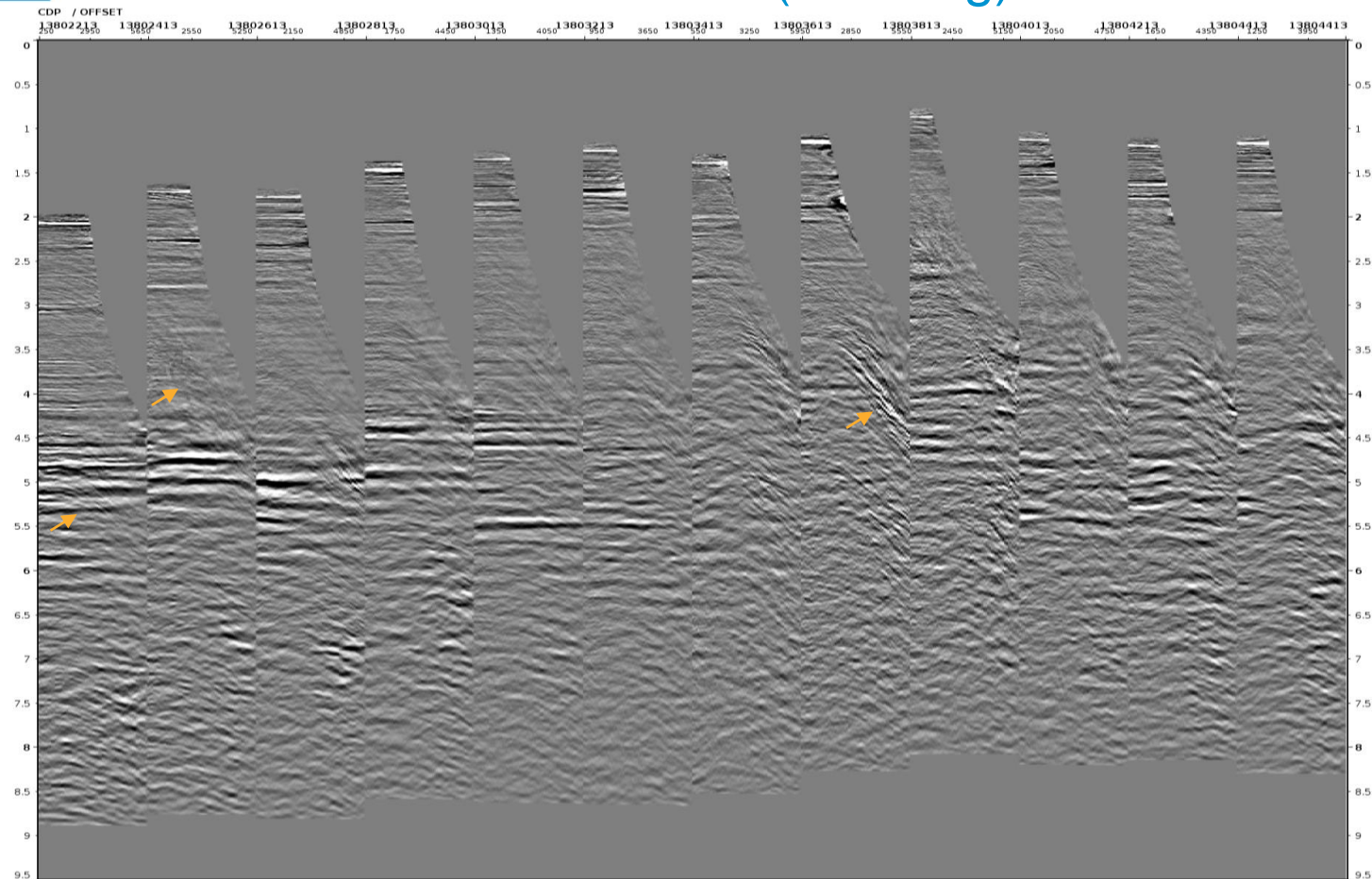
- Selected time CDP gathers (0-50deg)
- Full depth stack (0-35deg)





# Selected Time CDP Gathers (0-50deg) before Radon

6

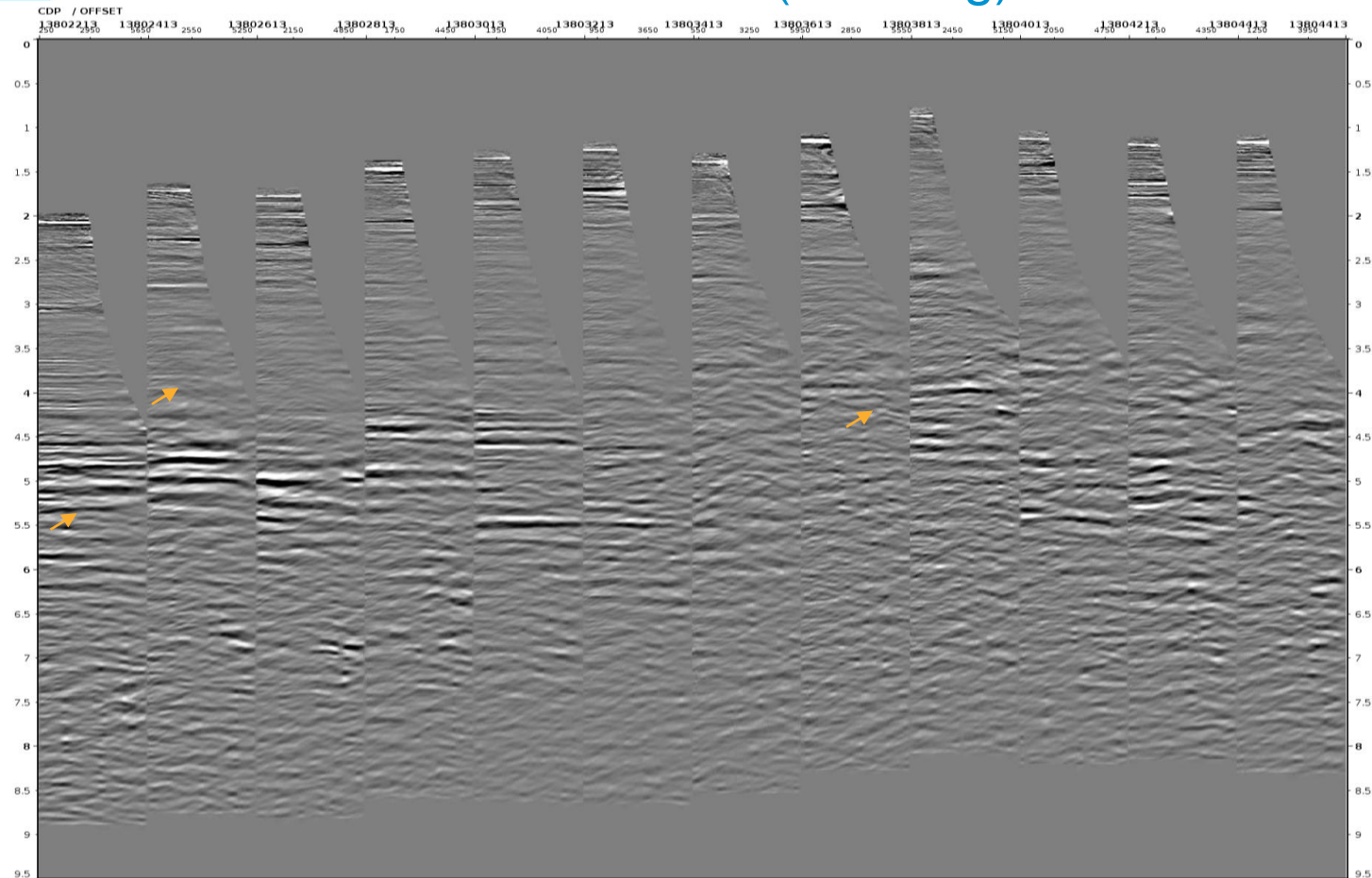


- Residual multiples are attenuated on CDP gathers.



# Selected Time CDP Gathers (0-50deg) **after** Radon

7

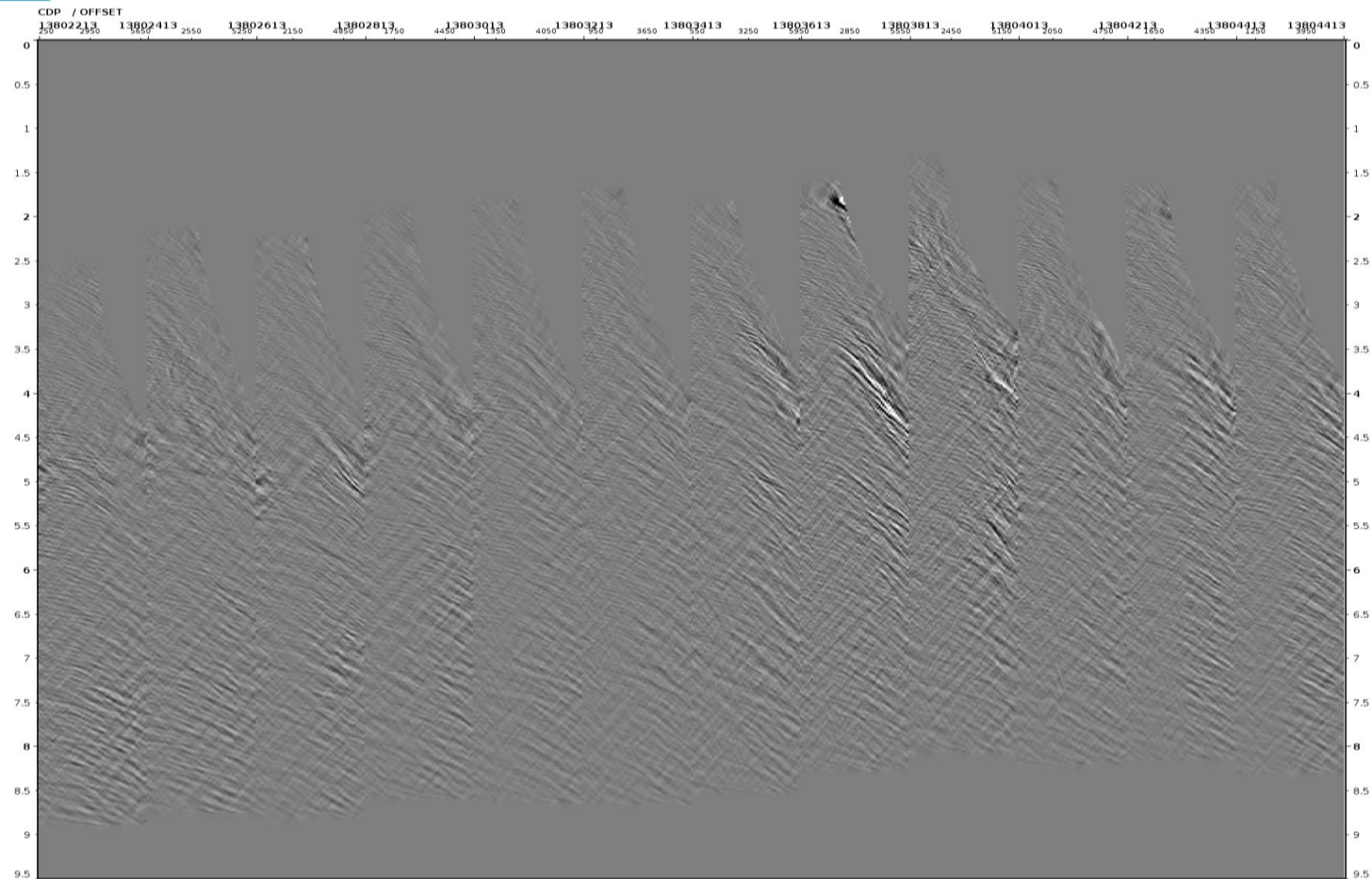


- Residual multiples are attenuated on CDP gathers.



# Difference before – after

8

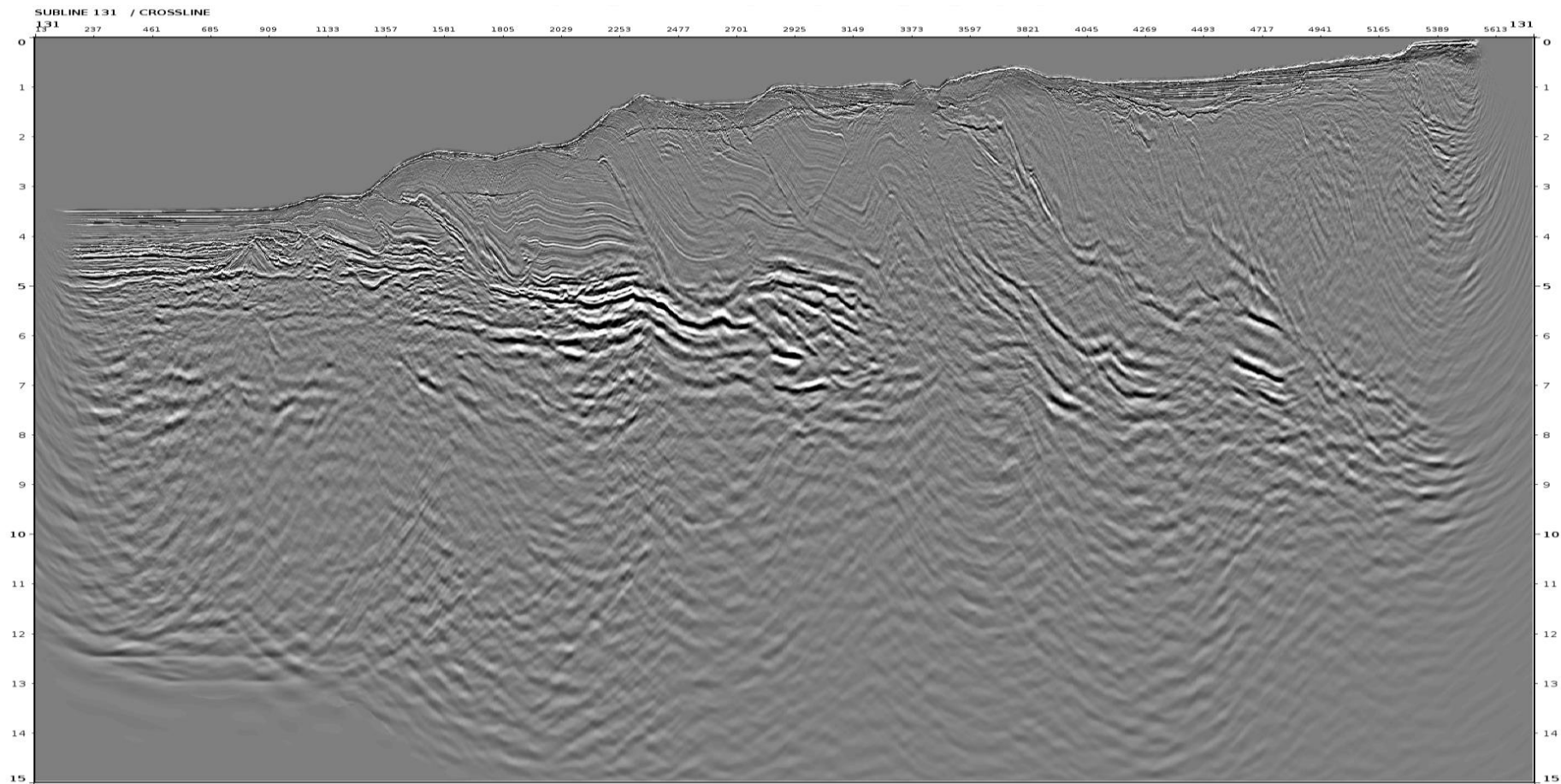






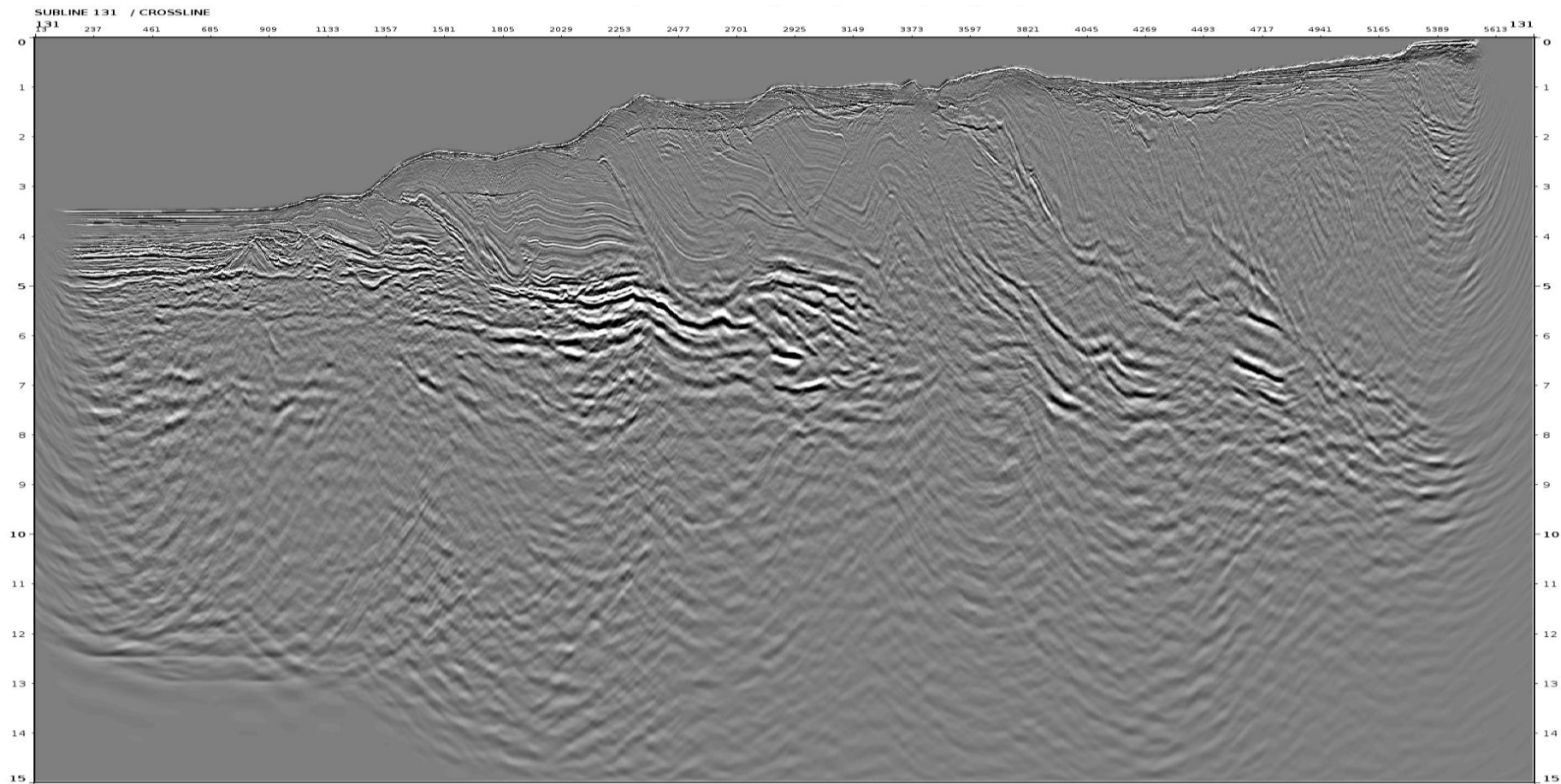
# Full Depth Stack (0-35deg) before Radon

9



# Full Depth Stack (0-35deg) **after** Radon

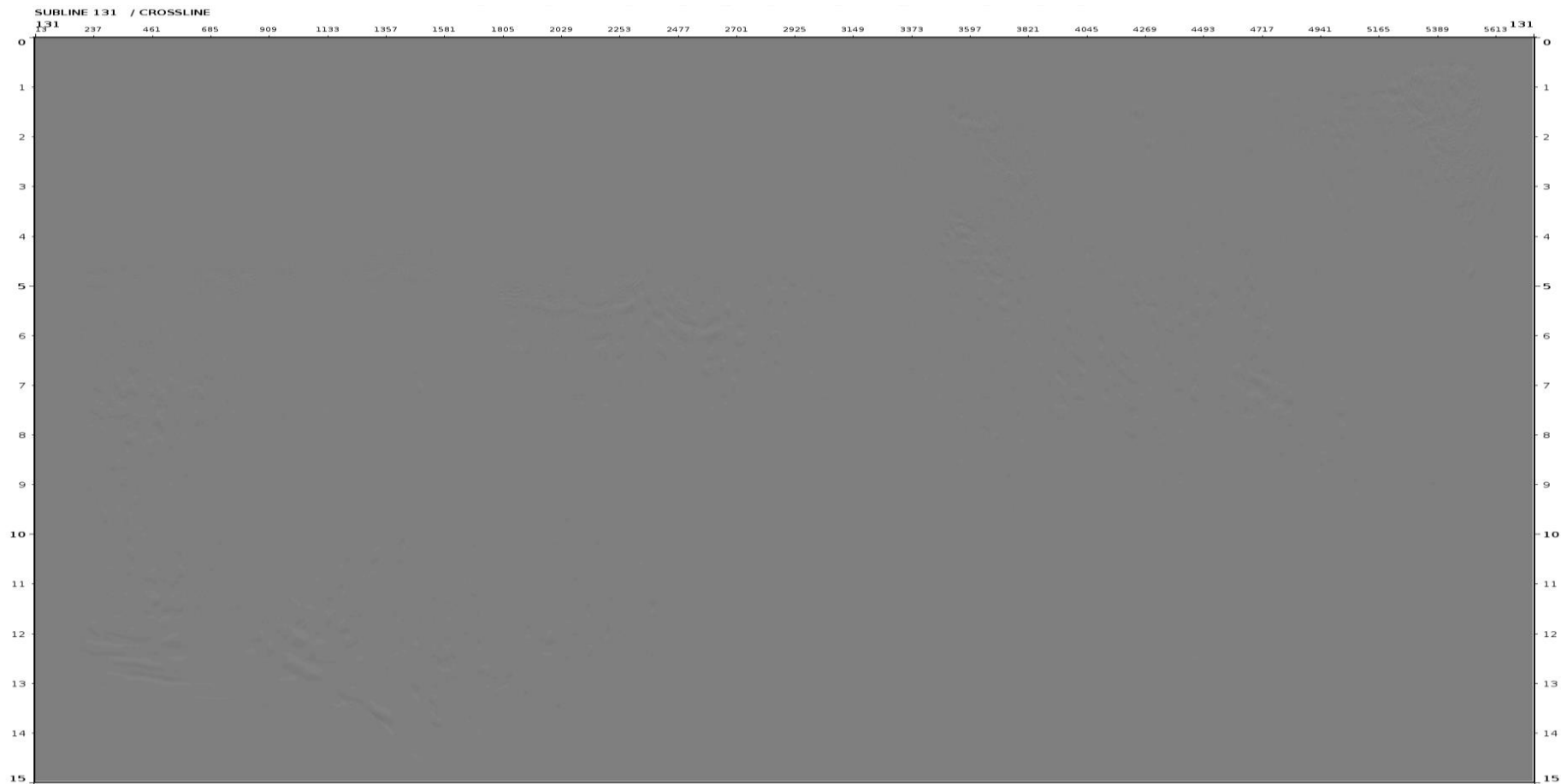
10





# Difference before – after

11



## IL 441

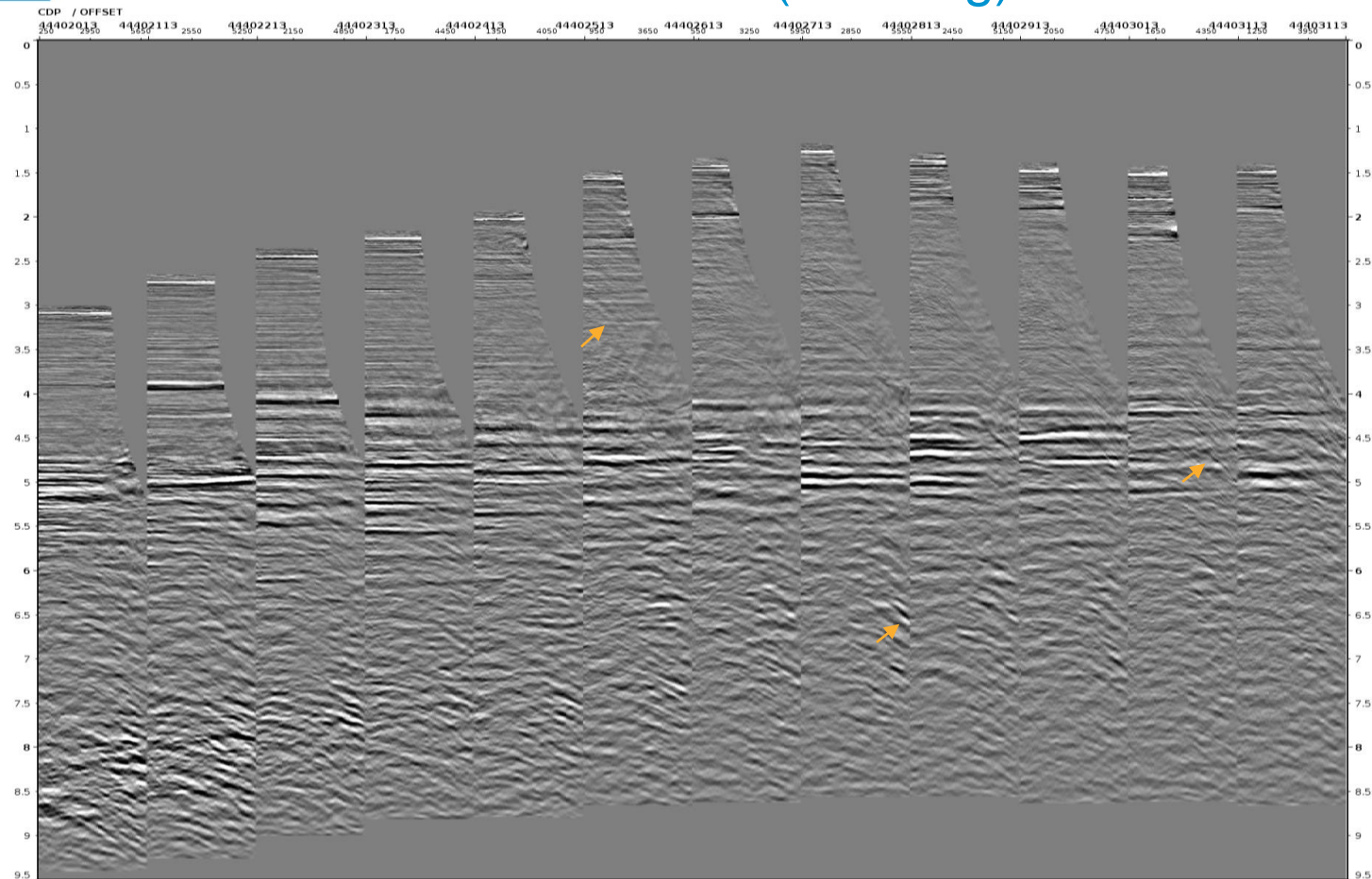
- Selected time CDP gathers (0-50deg)
- Full depth stack (0-35deg)





# Selected Time CDP Gathers (0-50deg) before Radon

13



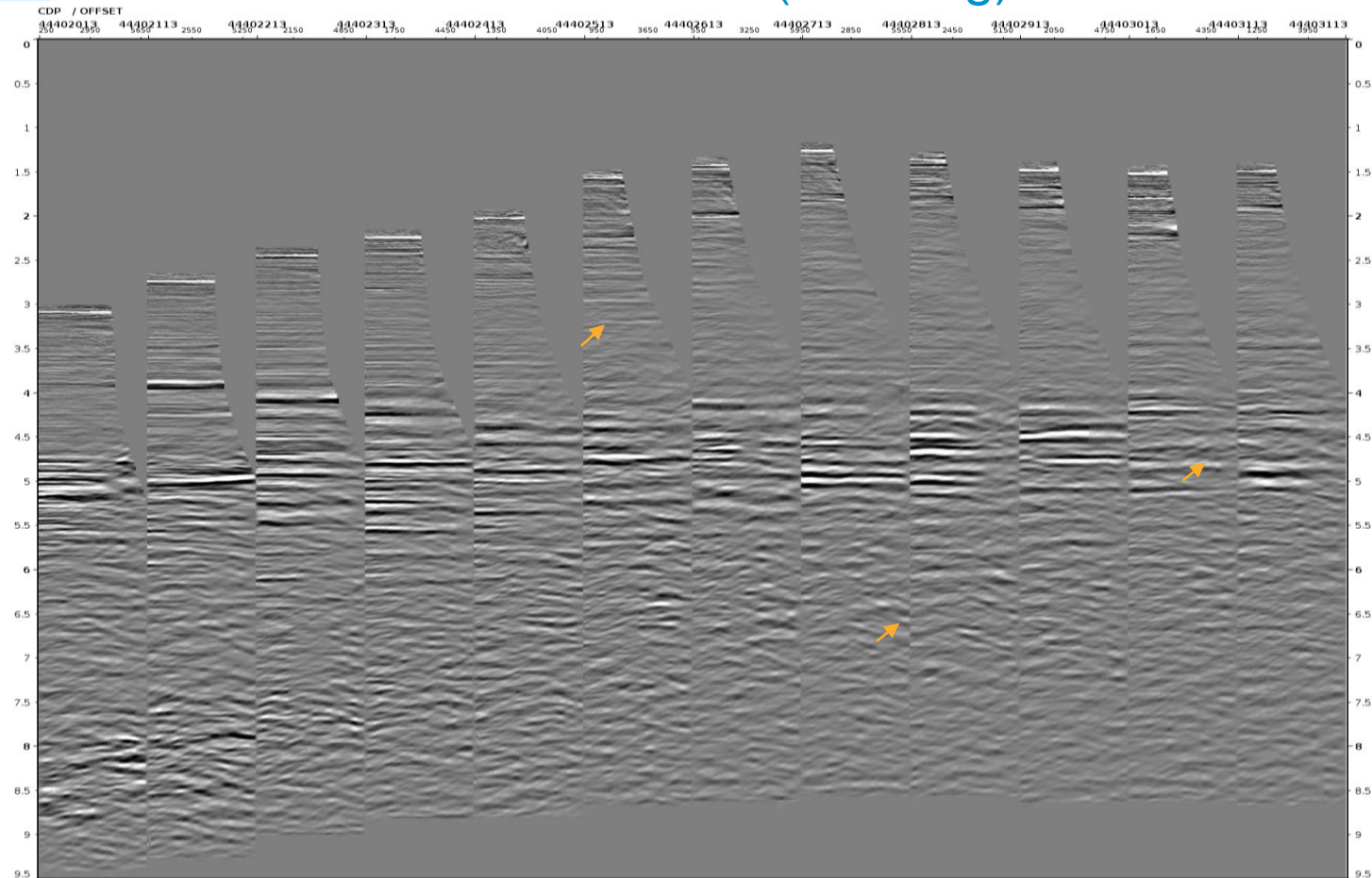
- Residual multiples are attenuated on CDP gathers.





# Selected Time CDP Gathers (0-50deg) after Radon

14

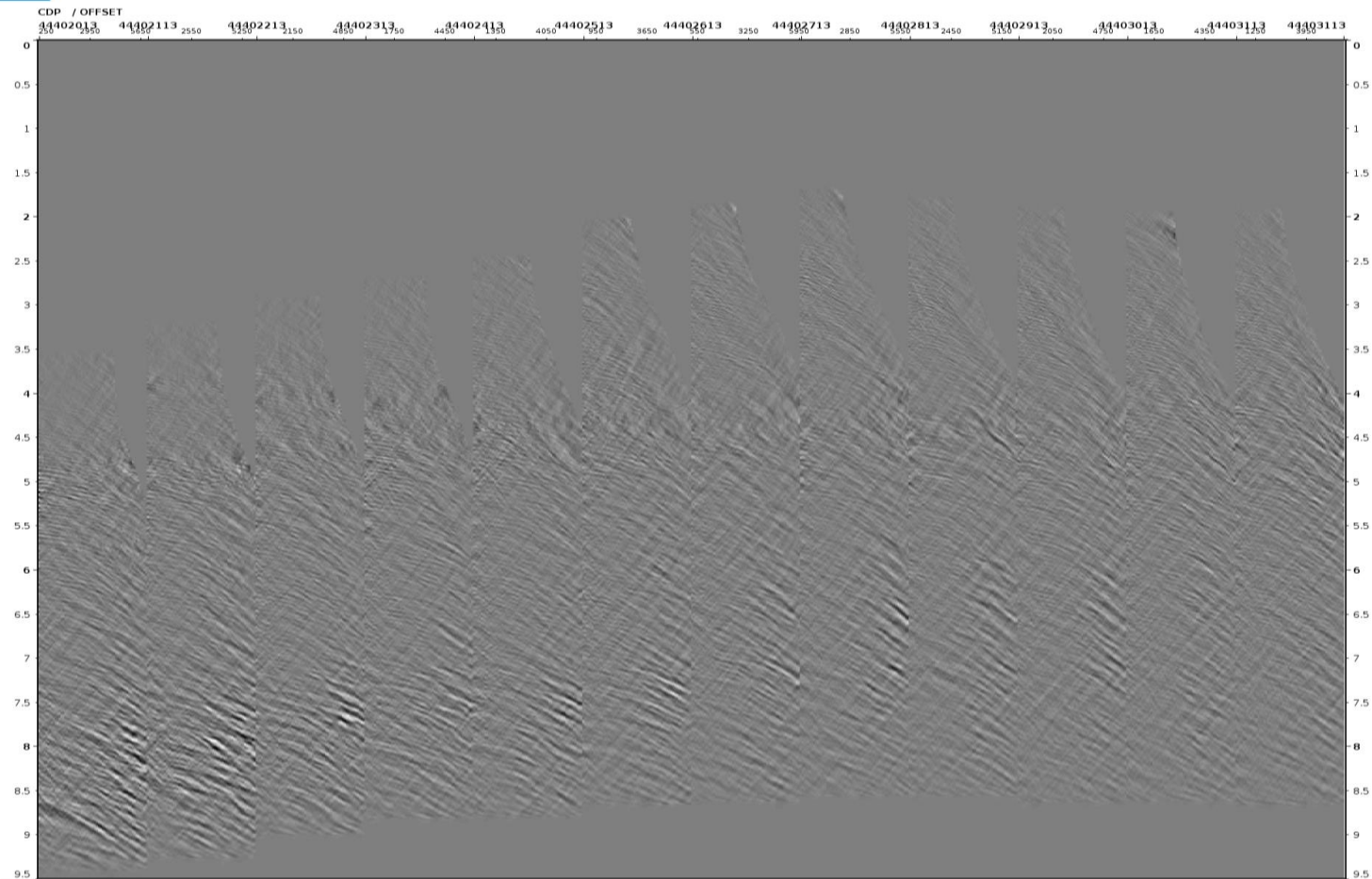


- Residual multiples are attenuated on CDP gathers.



# Difference before – after

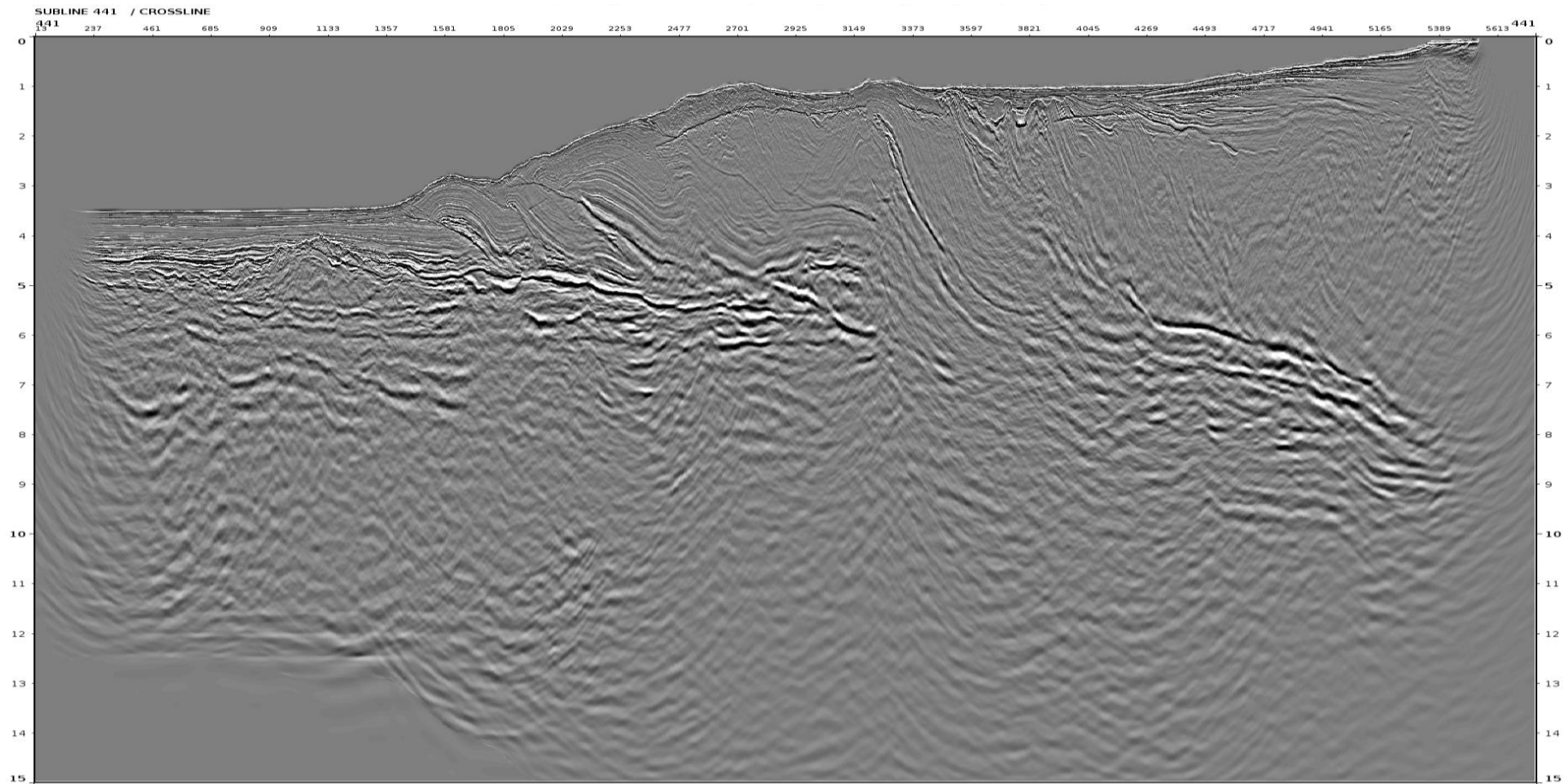
15





# Full Depth Stack (0-35deg) before Radon

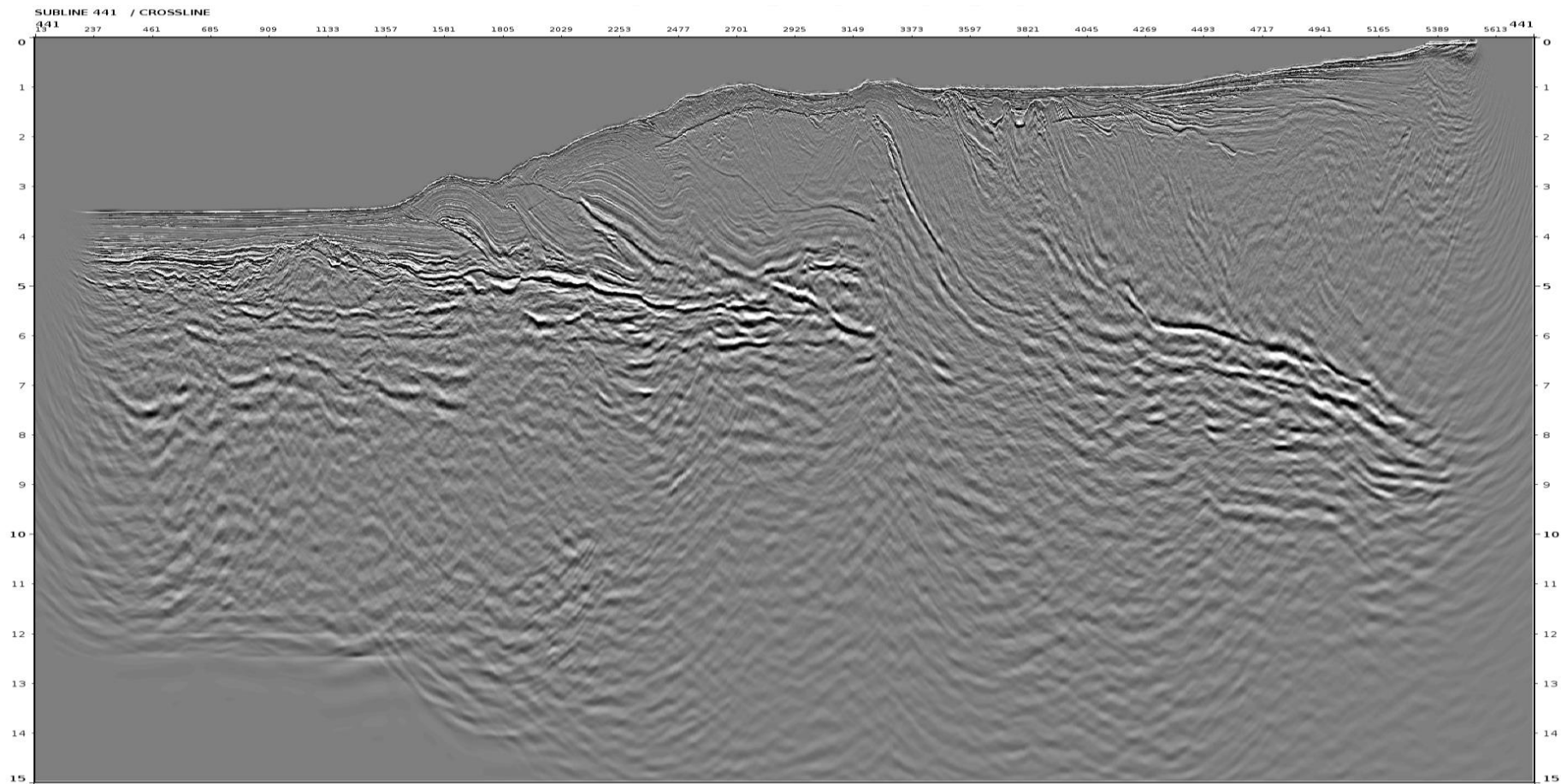
16





# Full Depth Stack (0-35deg) **after** Radon

17





# Difference before – after

18





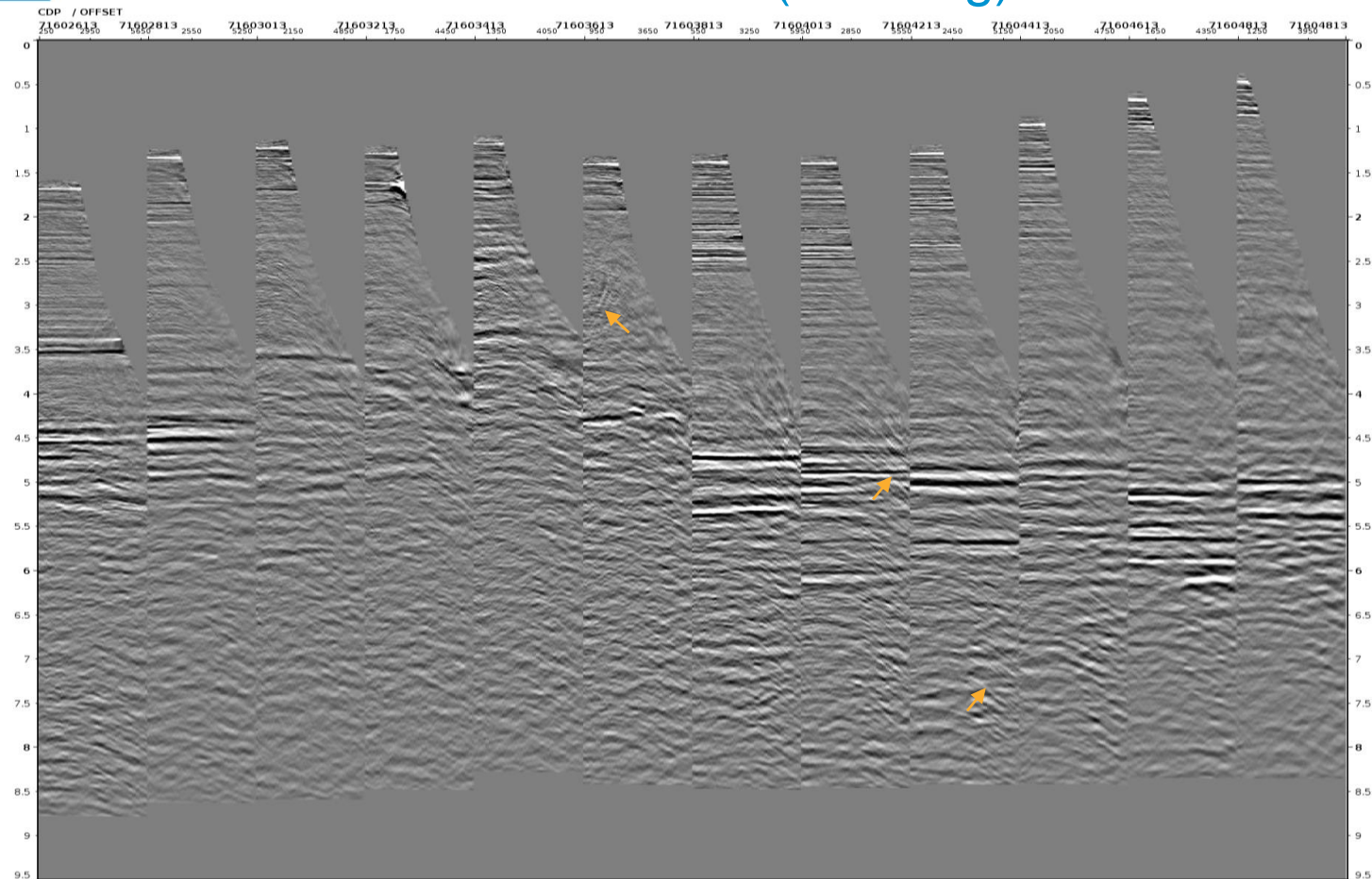
# IL 711

- Selected time CDP gathers (0-50deg)
- Full depth stack (0-35deg)



# Selected Time CDP Gathers (0-50deg) before Radon

20

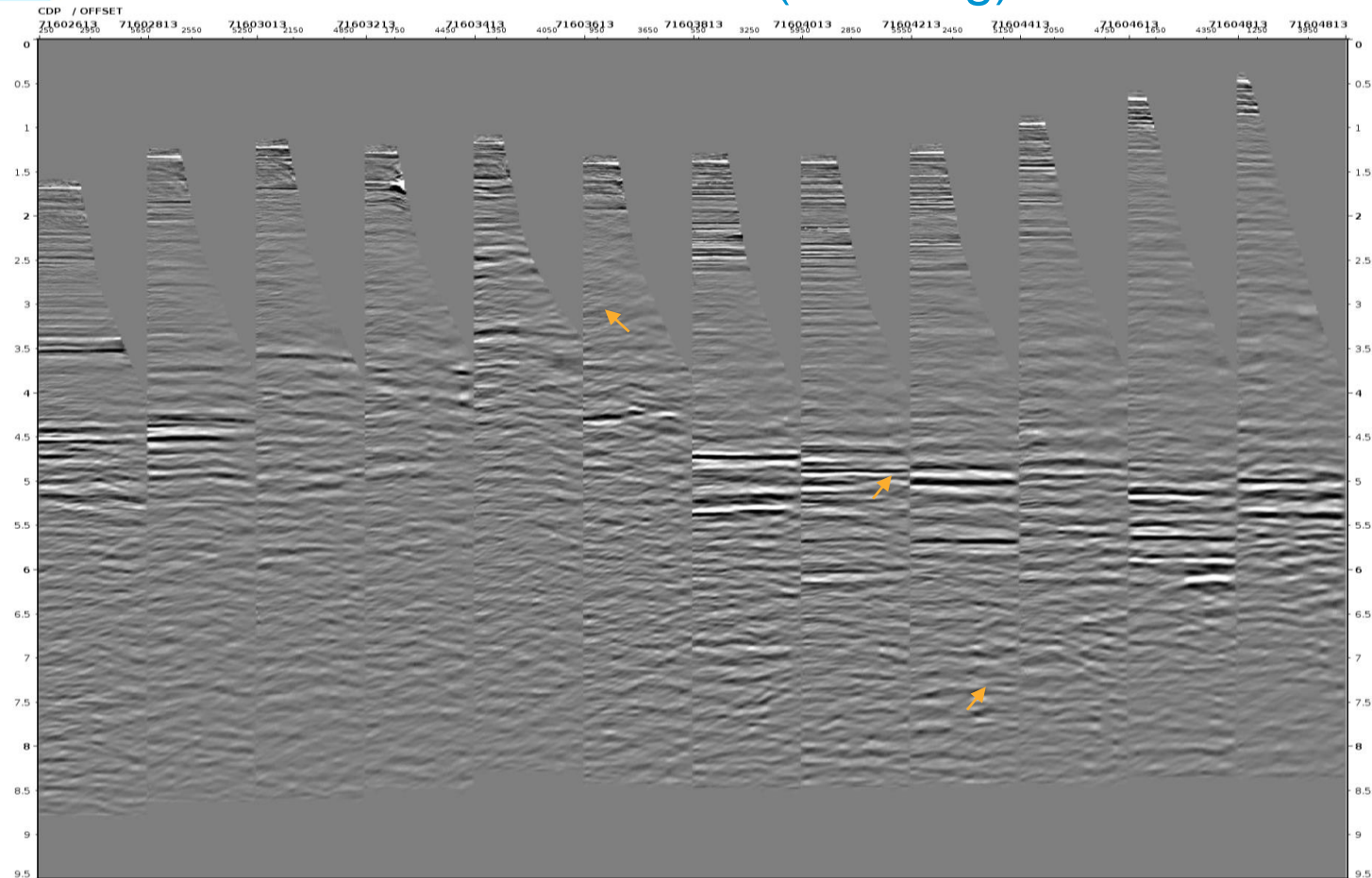


- Residual multiples are attenuated on CDP gathers.



# Selected Time CDP Gathers (0-50deg) **after** Radon

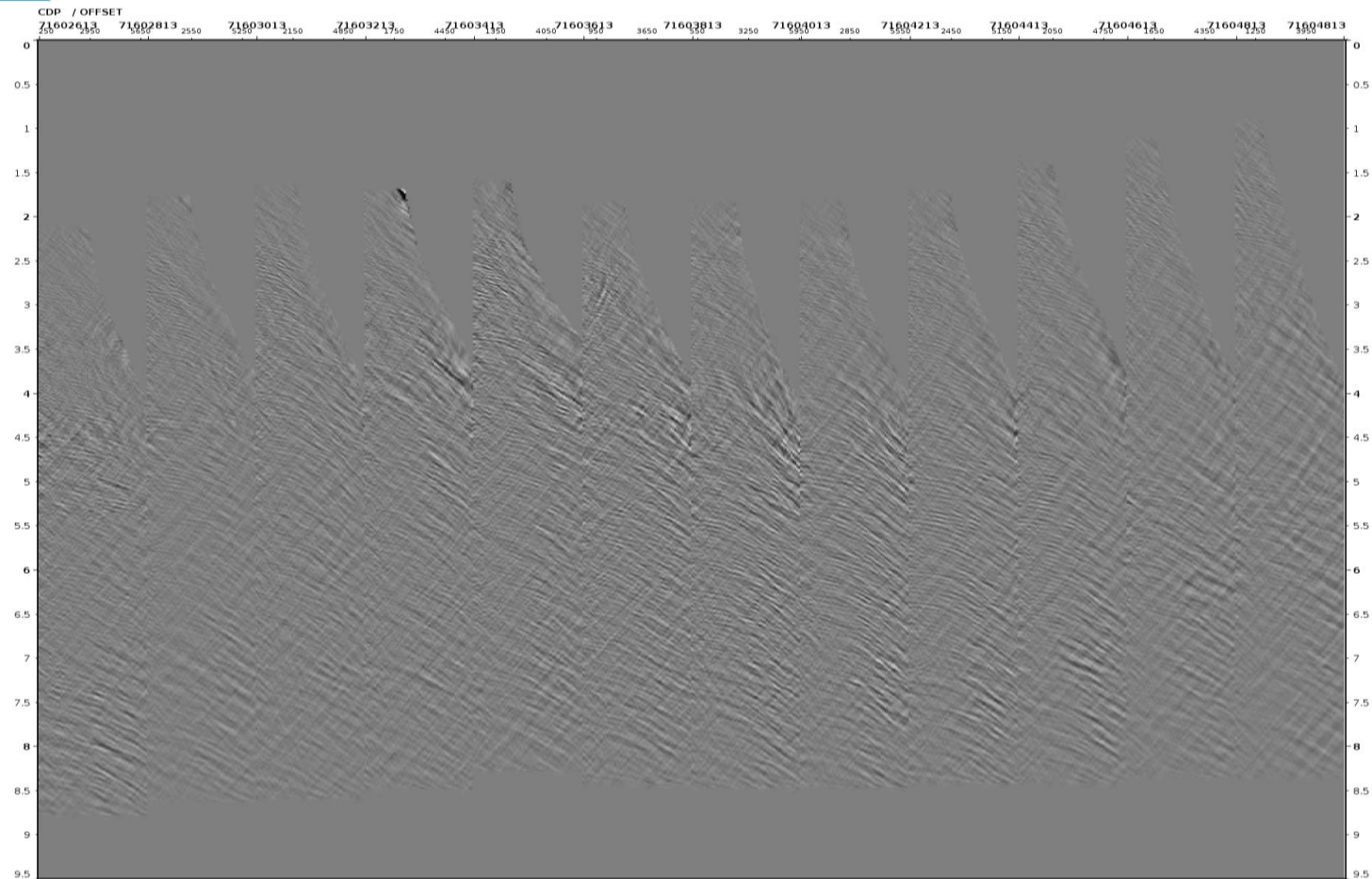
21



- Residual multiples are attenuated on CDP gathers.



# Difference before – after

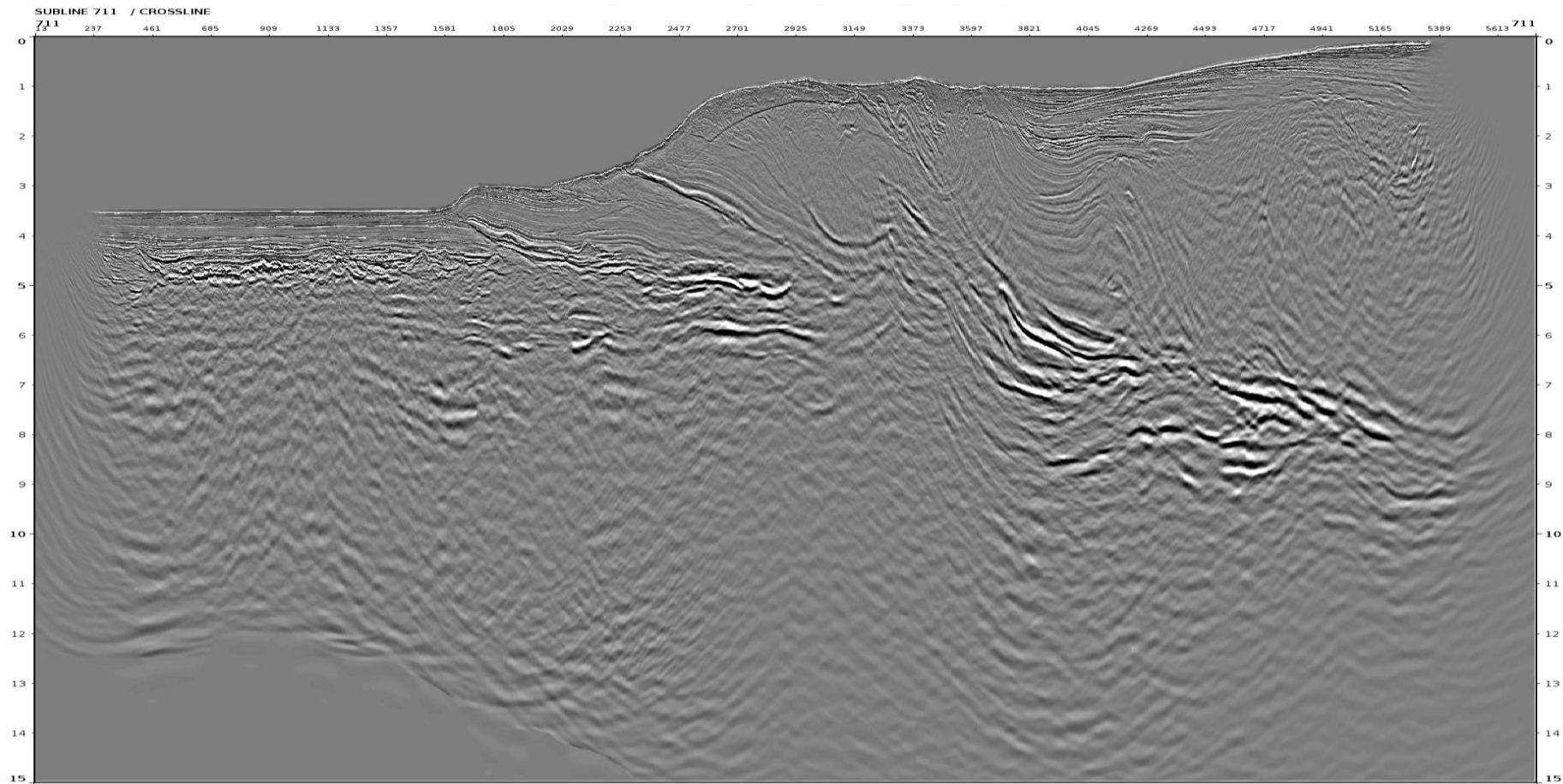






# Full Depth Stack (0-35deg) before Radon

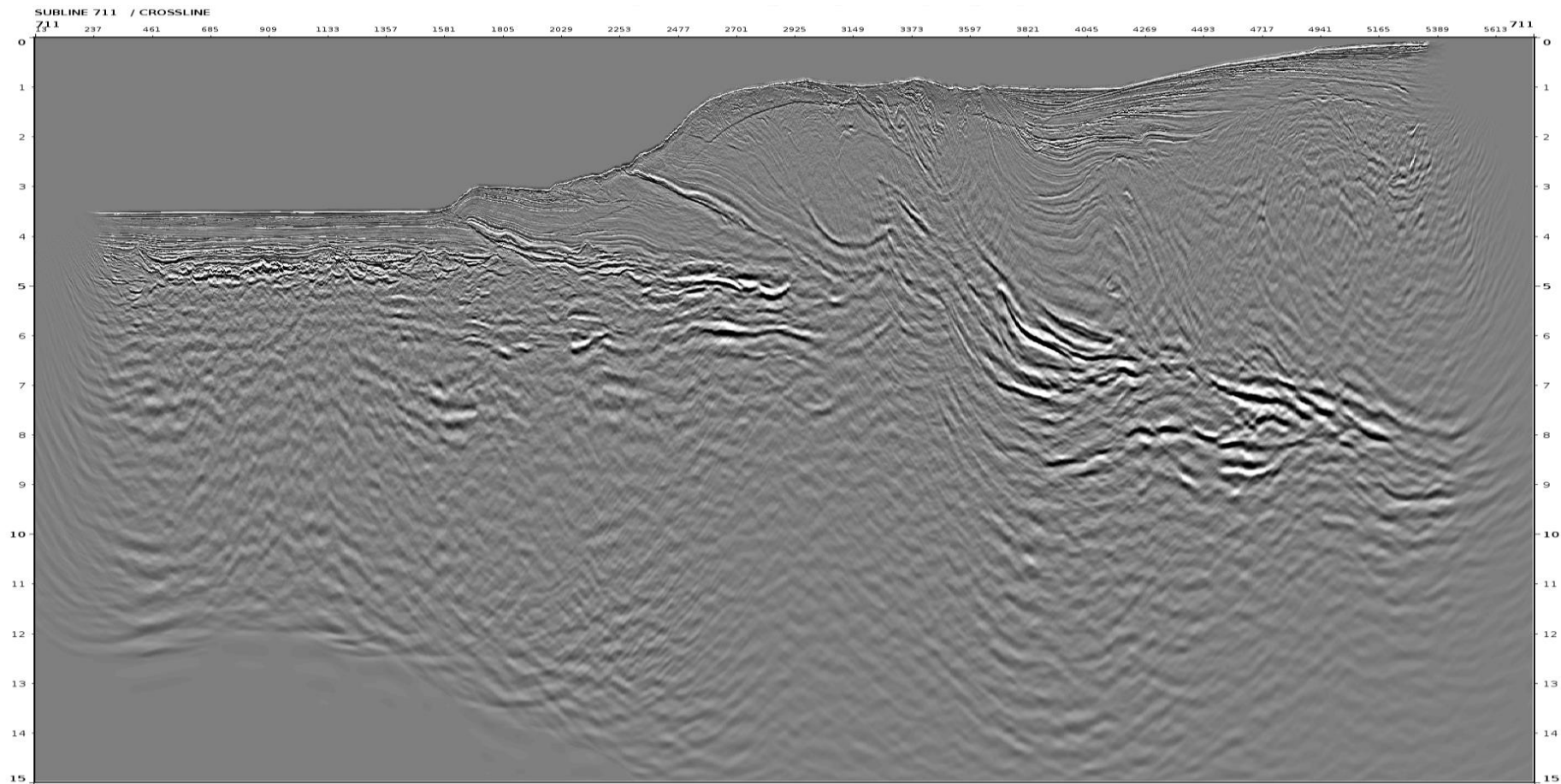
23





# Full Depth Stack (0-35deg) after Radon

24





# Difference before – after

25



- Post migration radon demultiple attenuates residual multiples on CDP gathers, as a result, CDP gathers are cleaner and primaries are more obvious.
- We recommend to apply for production.