

Appendices

A Chapter 5: CIP gathers and results

In this appendix, the results and gathers from chapter 5 are presented. The gathers with noise, without noise, and the difference are shown. The difference with and without noise is divided by the norm of the noise to show the characteristics of the noise. The results are shown for the P-wave velocity, S-wave velocity, and density. The legends in the results are removed in the figures but are explained here: The blue and black lines are the prior and posterior mean respectively. The light gray and dark gray areas are the 95% confidence areas for the prior and posterior, respectively. The red line in the true model. The legend is shown in figure 1.






-  95% prior confidence area
-  95% posterior confidence area
-  Prior mean
-  Posterior mean
-  True model

Figure 1: Legend used for results in this appendix.

CIP gather

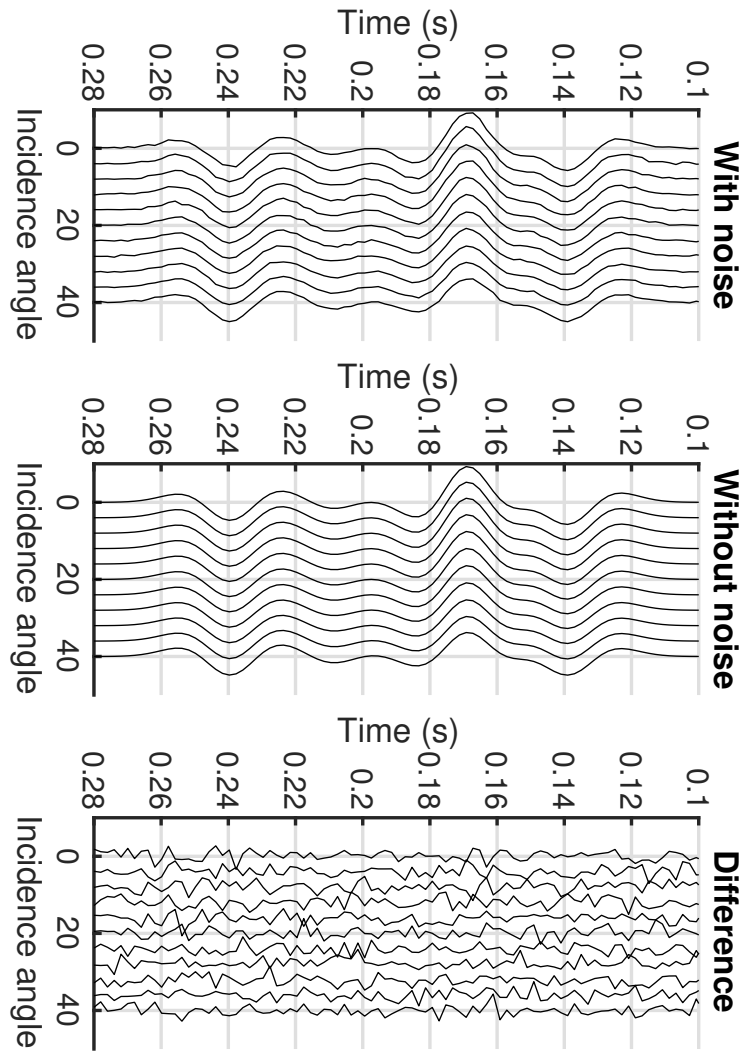


Figure 2: Gathers with and without random Gaussian noise. The SNR is high (SNR=15), therefore it is hard to see the difference between the gathers with and without noise at this large scale.

The EnOI method

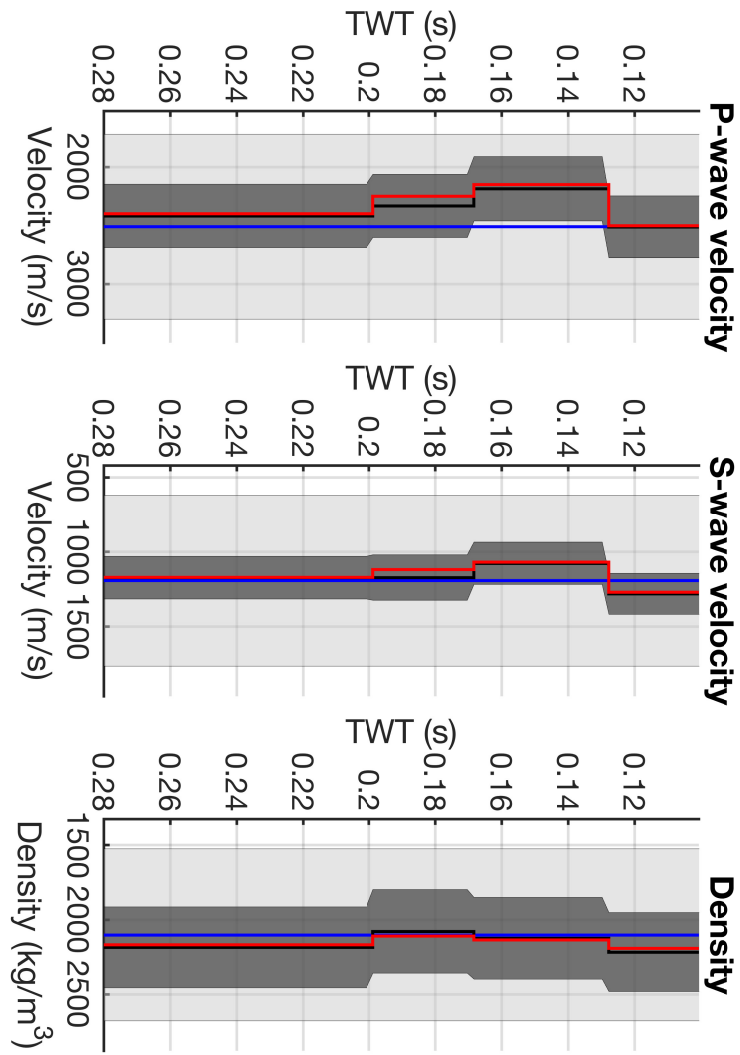


Figure 3: Results using the EnOI method.

The EnOI-MDA method

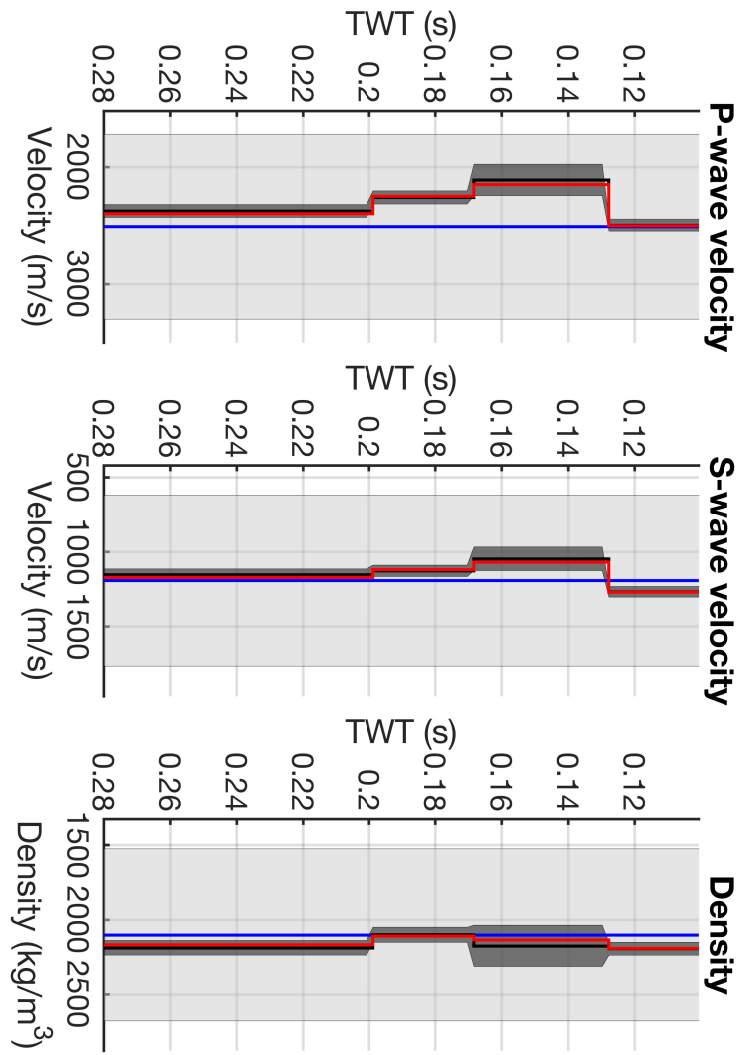


Figure 4: Results using the EnOI-MDA method.

B Chapter 6: CIP gathers and results

In this appendix, the results and gathers for each type of noise are presented. For each type of noise, the gathers with noise, without noise, and the difference are shown. The difference with and without noise is divided by the norm of the noise to show the characteristics of the noise. The results are shown for the P-wave velocity, S-wave velocity, and density. The legends in the results are removed in the figures but are explained here: The blue and black lines are the prior and posterior mean respectively. The light gray and dark gray areas are the 95% confidence areas for the prior and posterior, respectively. The red line in the true model. The red line in the true model. The legend is shown in figure 5.

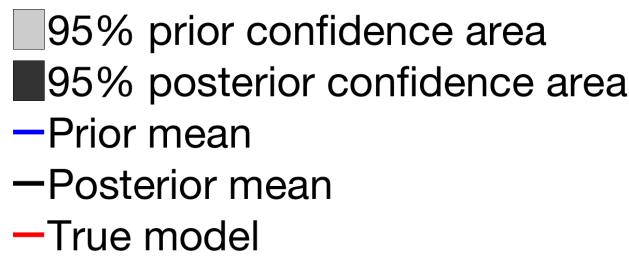


Figure 5: Legend used for results in this appendix.

Random Gaussian noise

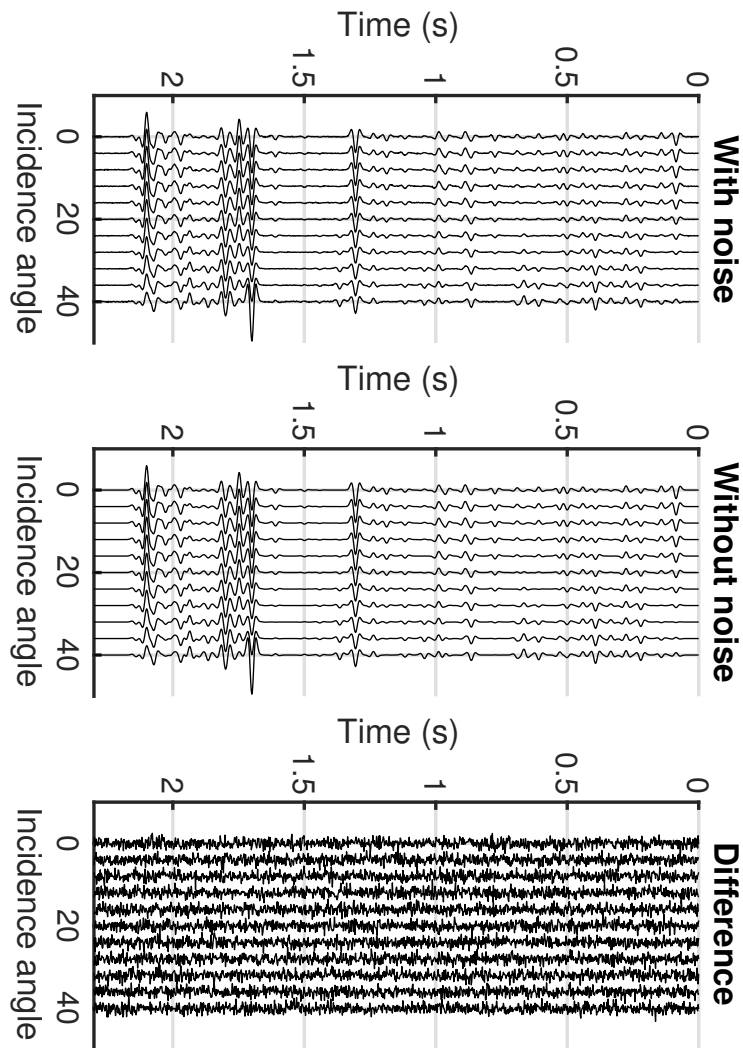


Figure 6: Gathers with and without random Gaussian noise. The SNR is high (SNR=15), therefore it is hard to see the difference between the gathers with and without noise at this large scale.

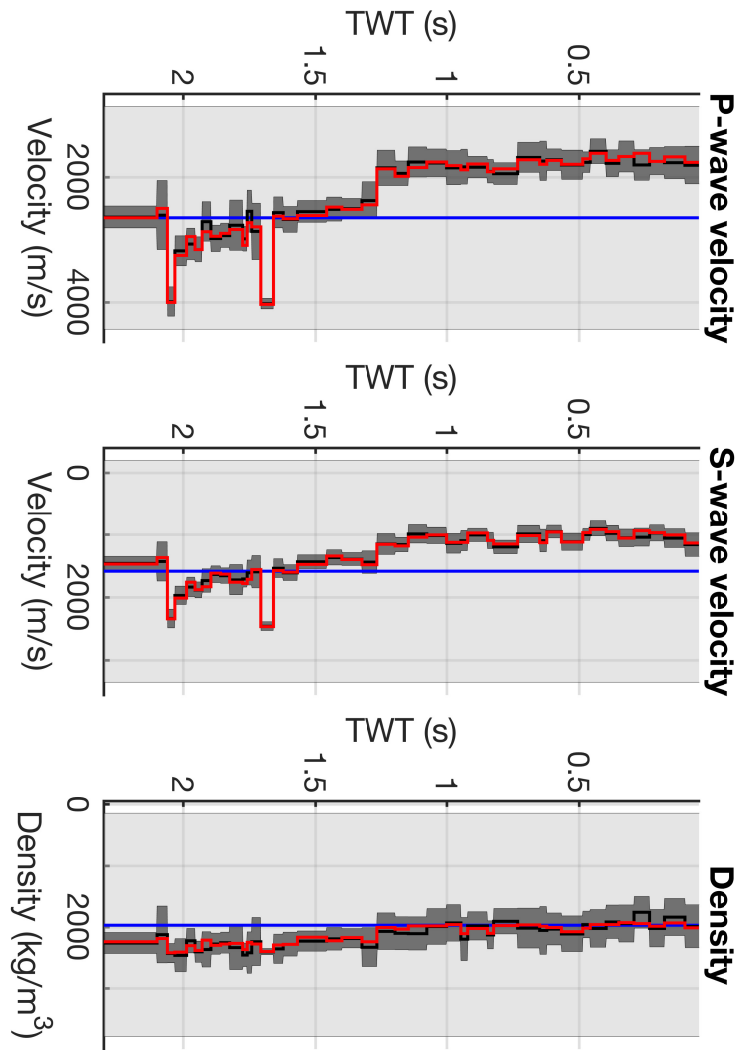


Figure 7: Results using random Gaussian noise.

Increasing noise with depth

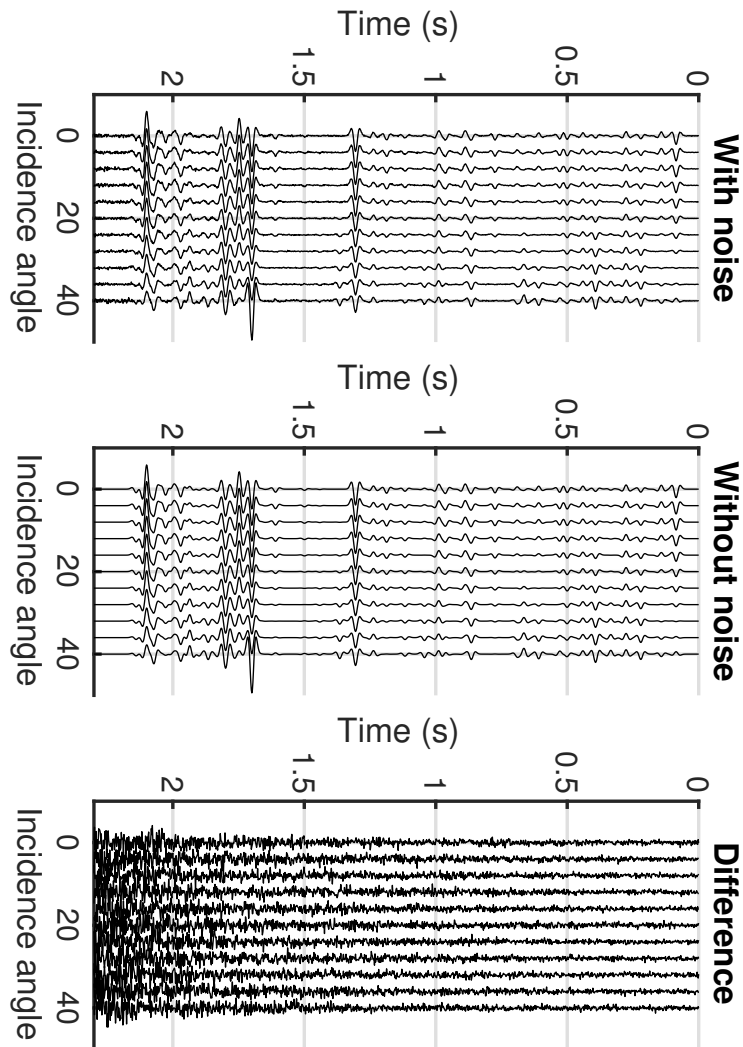


Figure 8: Gathers with and without increasing random Gaussian noise with depth.

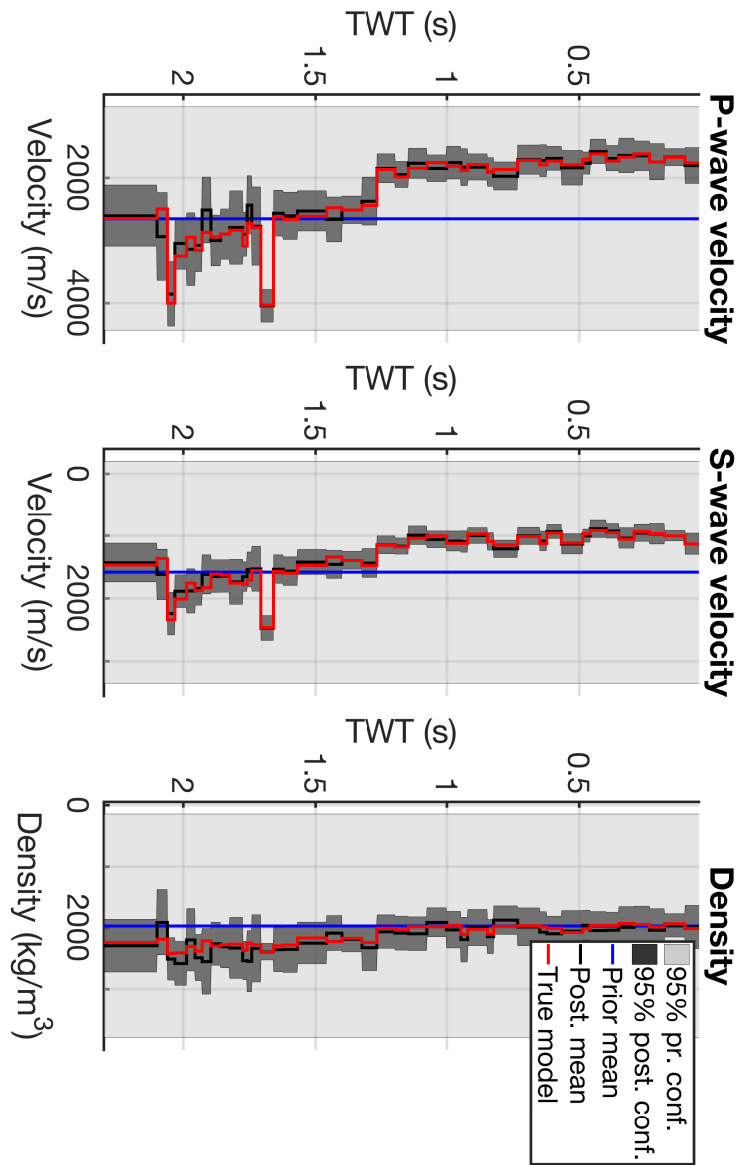


Figure 9: Results using increasing random Gaussian noise.

Attenuation with dispersion

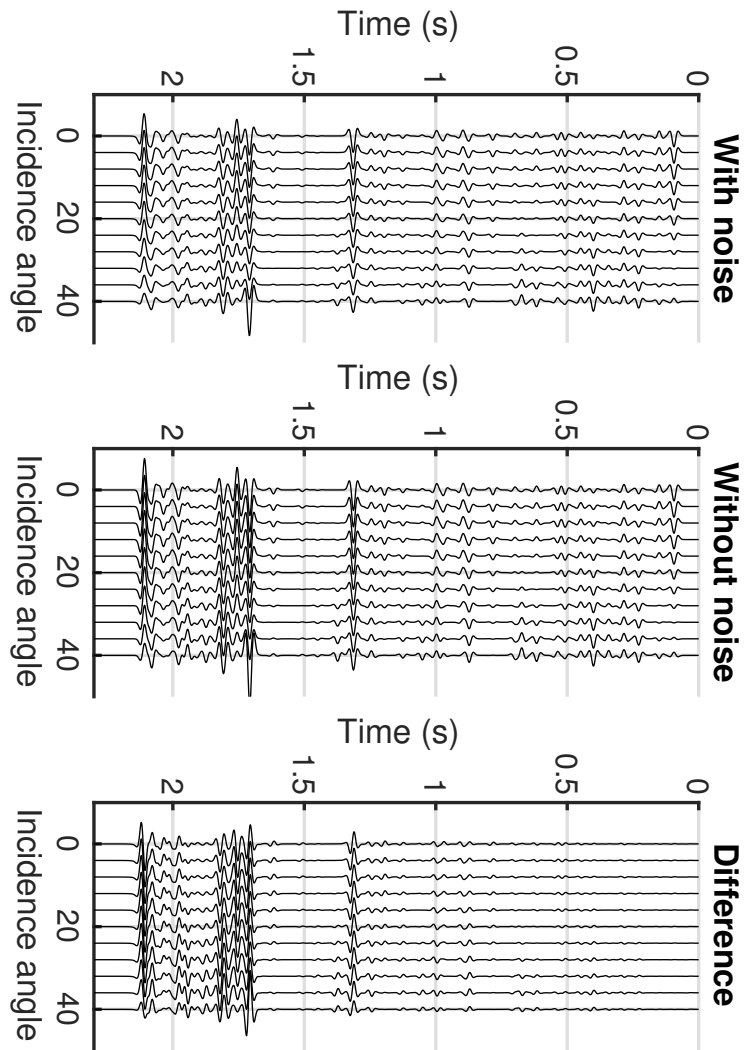


Figure 10: Gathers with dispersion and attenuation, and without dispersion and attenuation as noise.

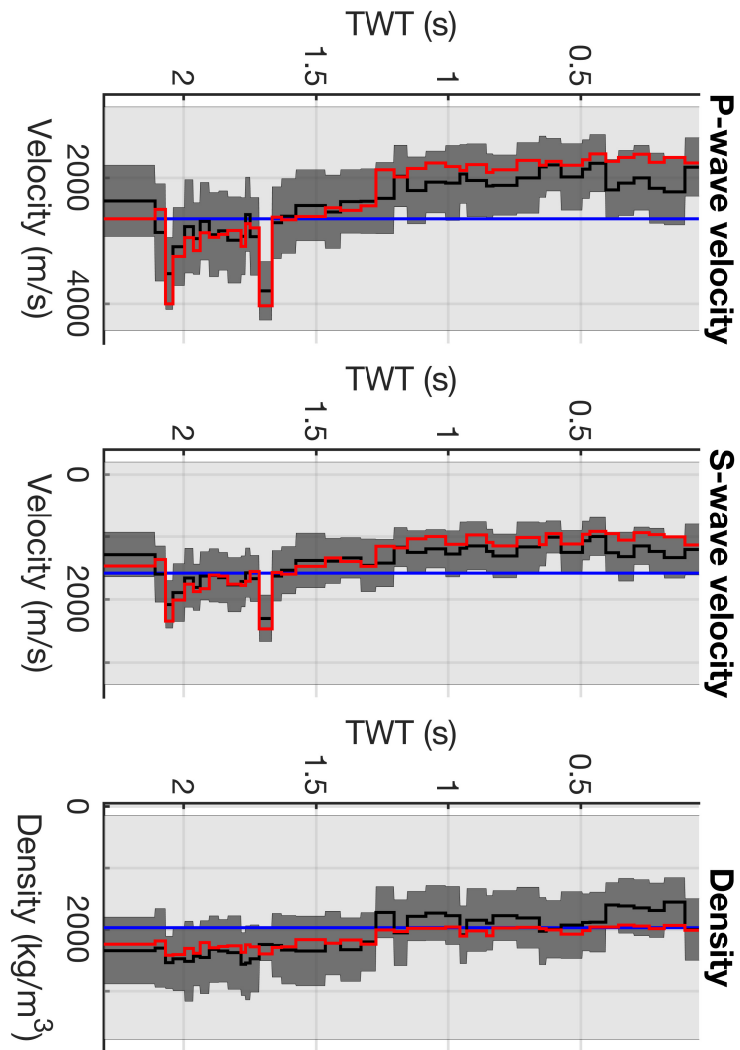


Figure 11: Results using dispersion and attenuation as noise.

Dispersion (without attenuation)

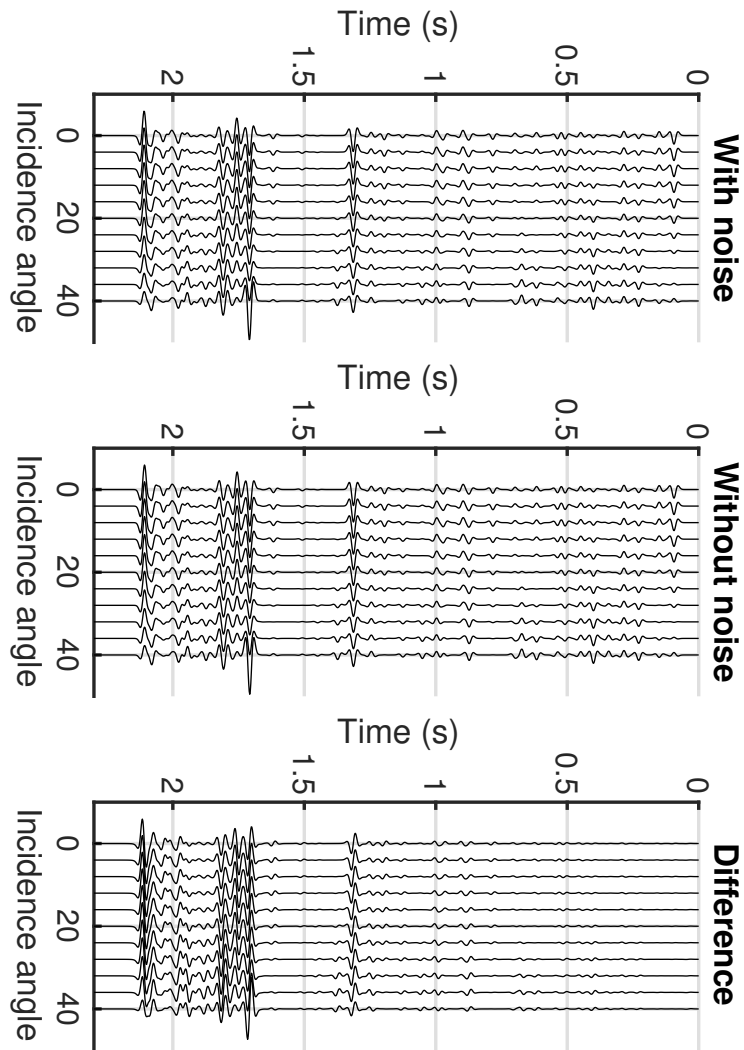


Figure 12: Gathers with and without dispersion (without attenuation) as noise.

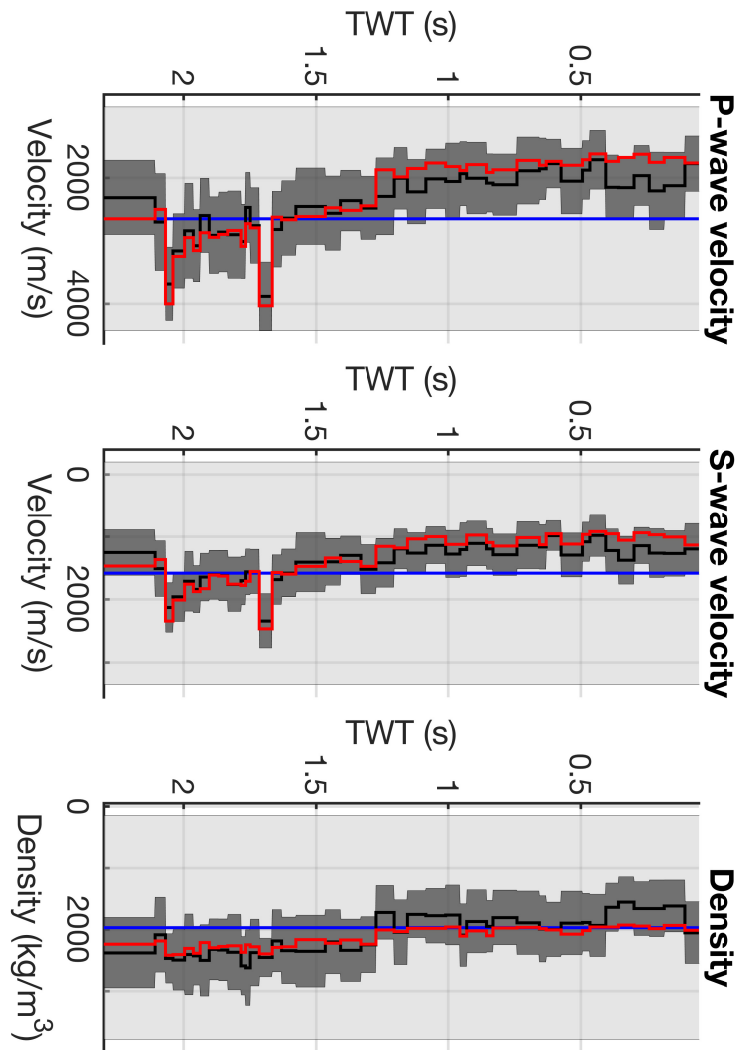


Figure 13: Results using dispersion (without attenuation) as noise.

Wrong wavelet estimation

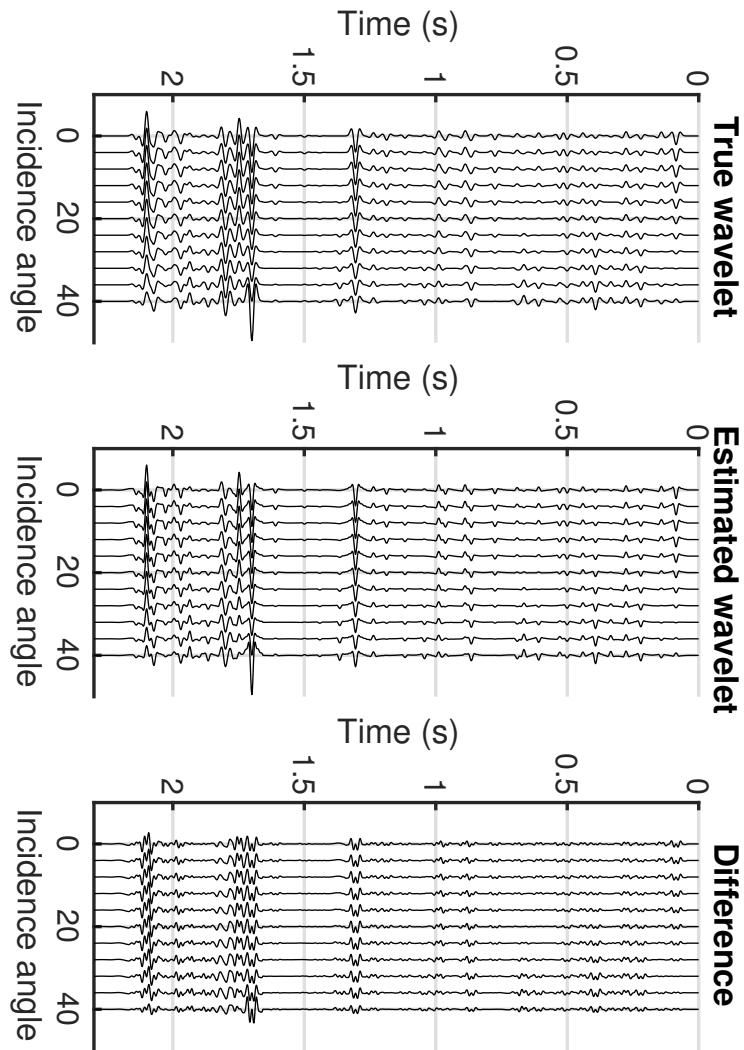


Figure 14: Gathers with the true wavelet and the estimated wavelet.

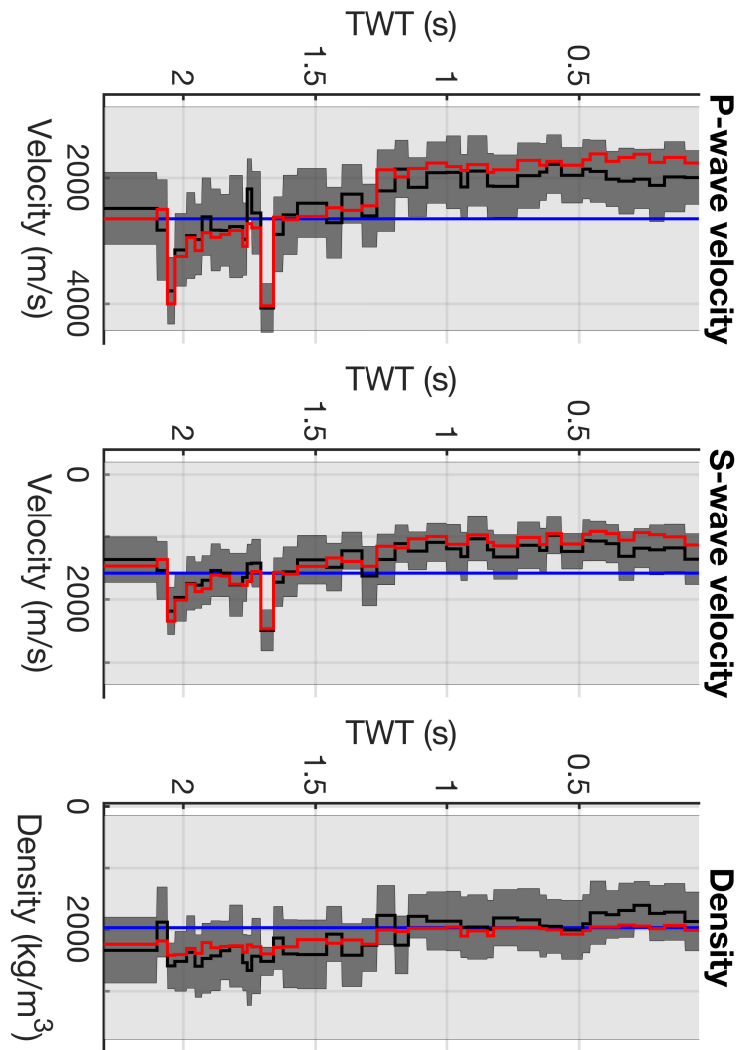


Figure 15: Results using the estimated wavelet as noise.

Multiples (without attenuated surface multiples)

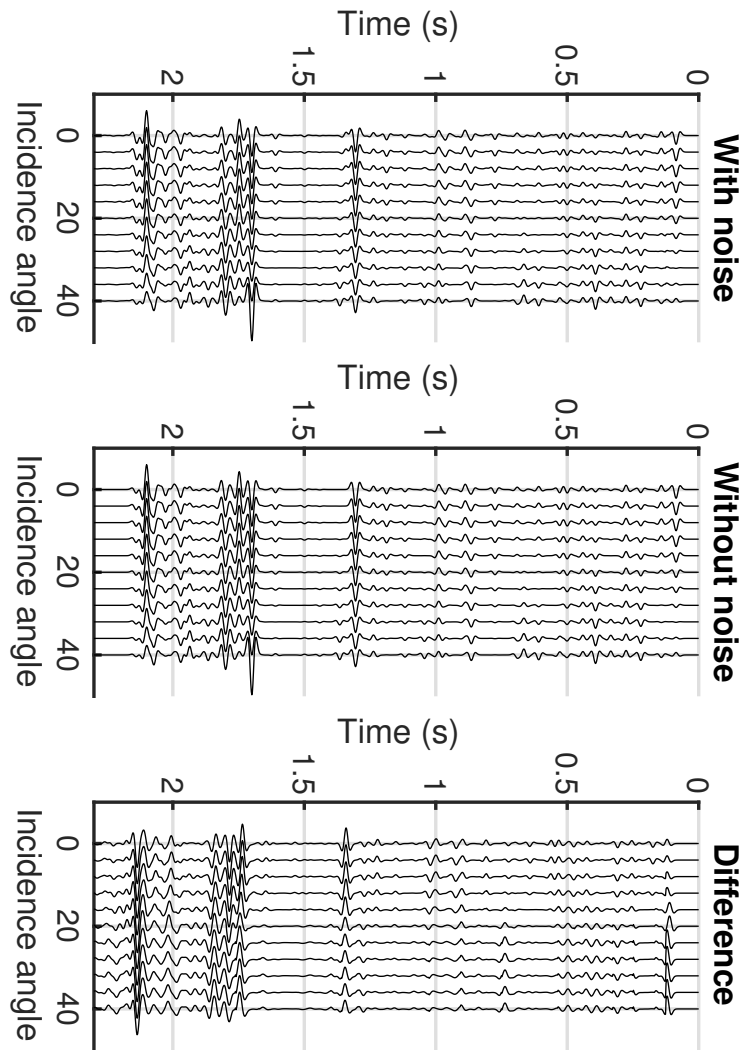


Figure 16: Gathers with and without multiples (without attenuated surface multiples) as noise.

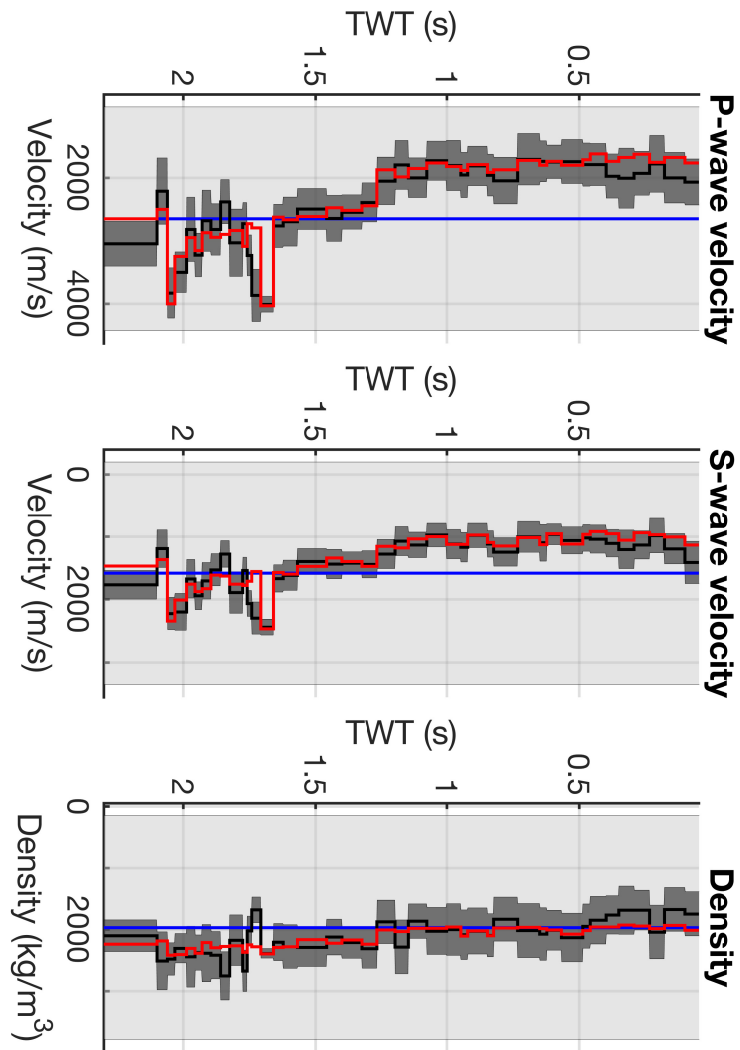


Figure 17: Results using multiples (without attenuated surface multiples) as noise.

Multiples (with attenuated surface multiples)

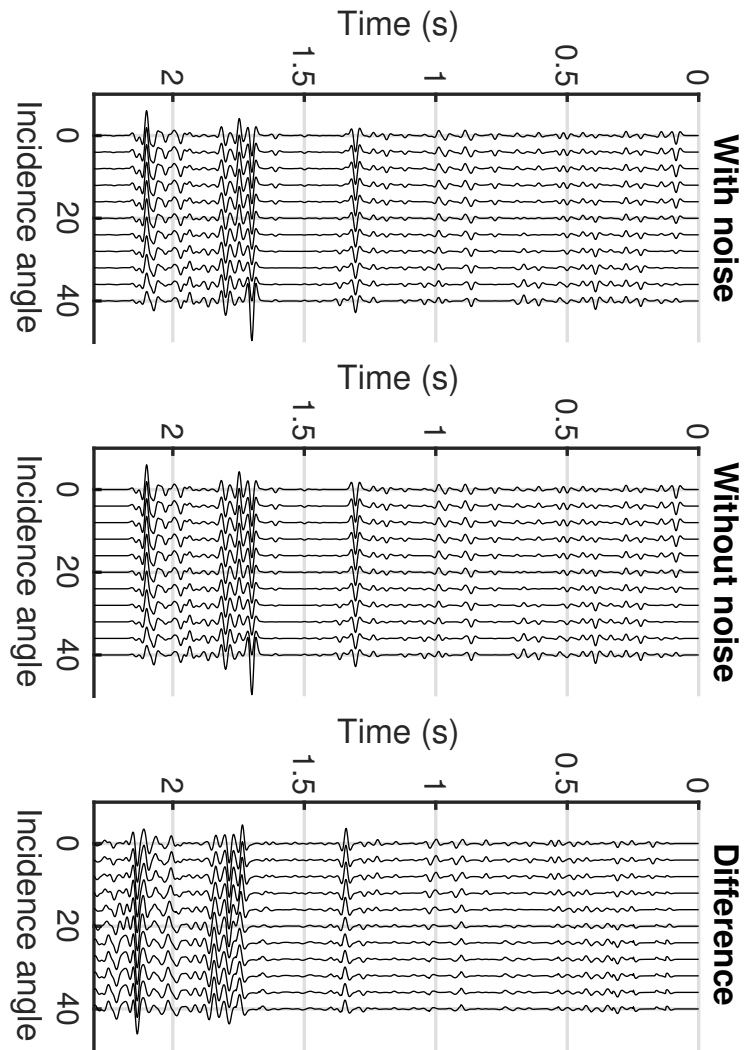


Figure 18: Gathers with and without multiples (with attenuated surface multiples) as noise.

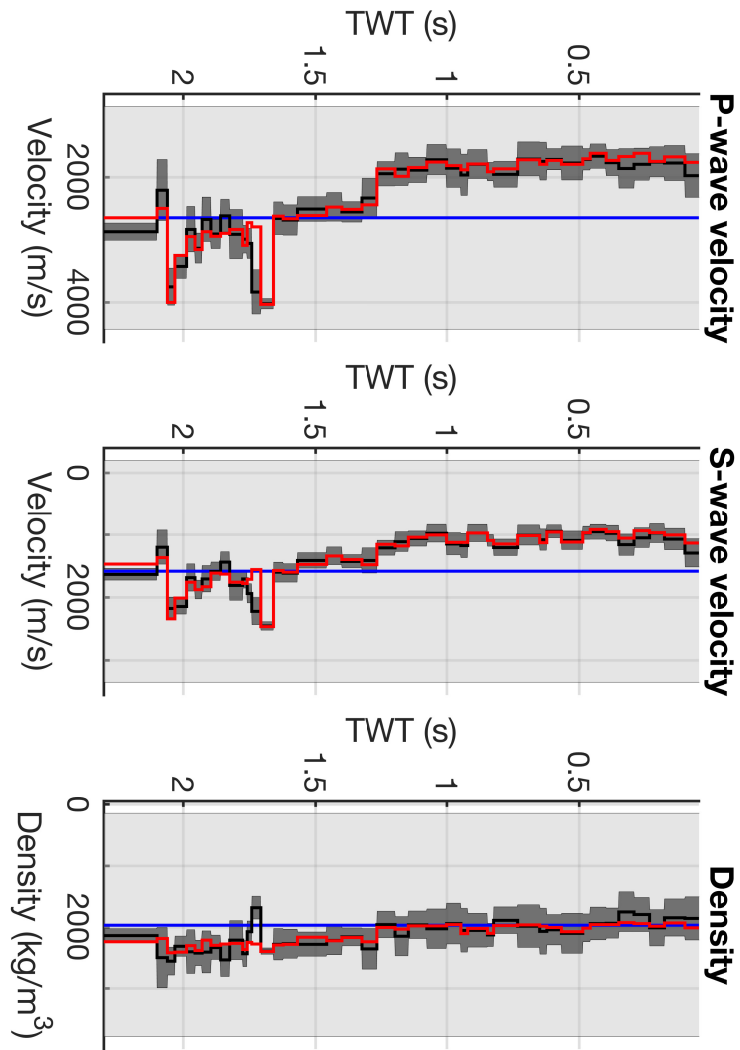


Figure 19: Results using multiples (with attenuated surface multiples) as noise.

Ghosts

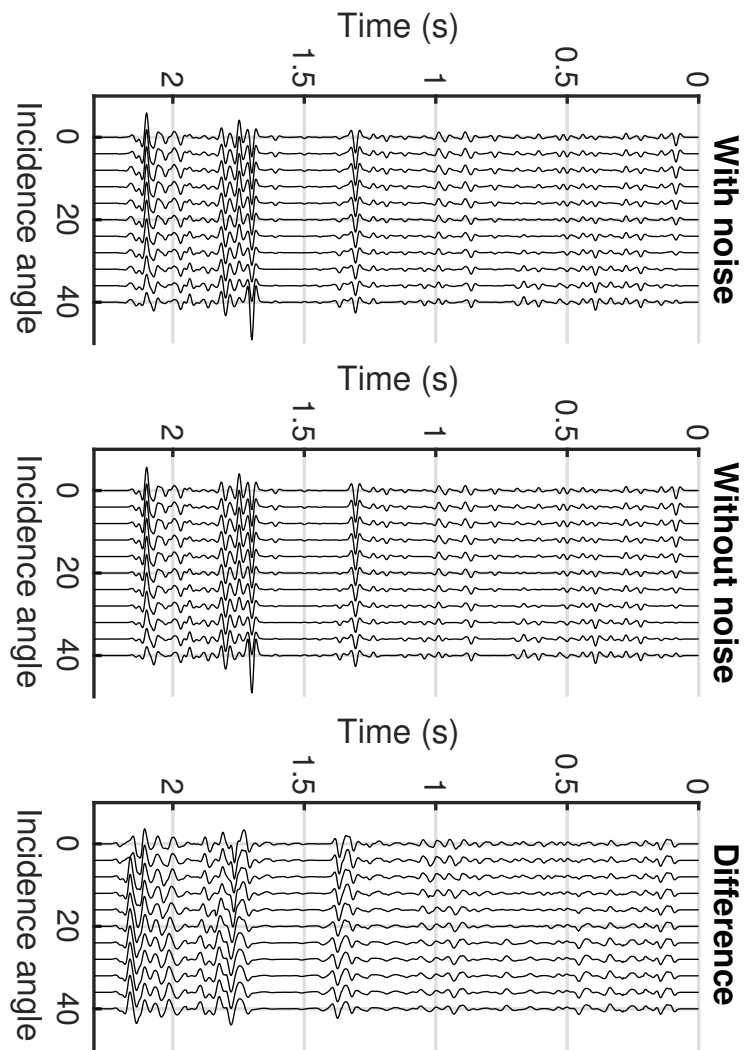


Figure 20: Gathers with and without ghosts as noise.

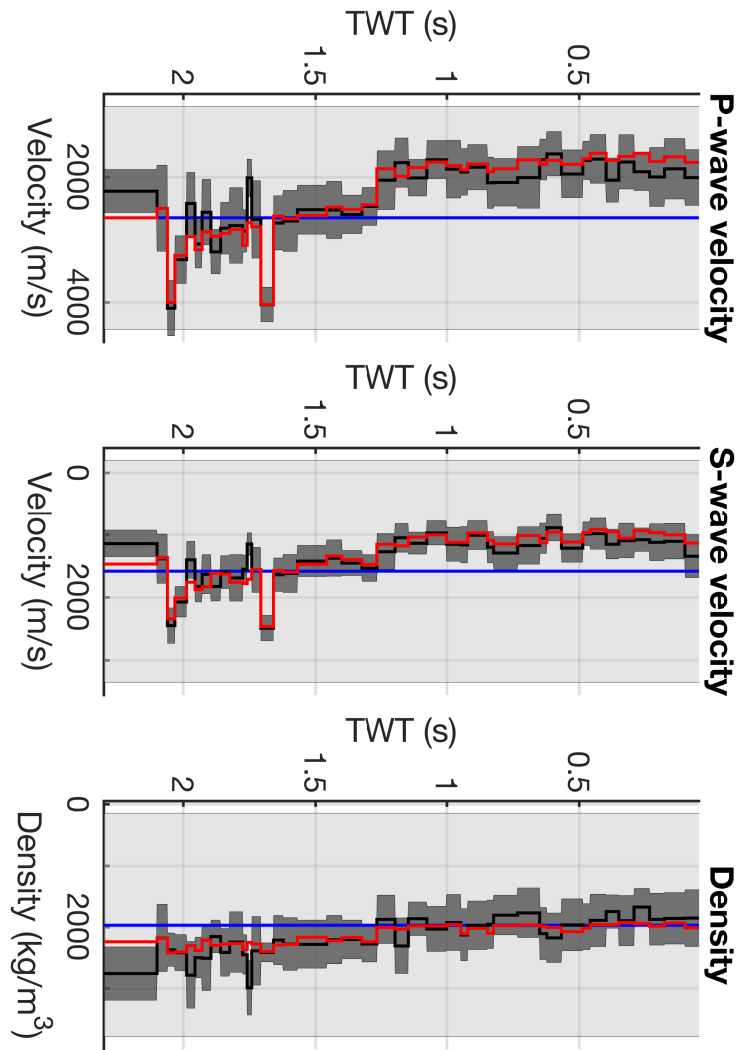


Figure 21: Results using ghosts as noise.

Random heterogeneities

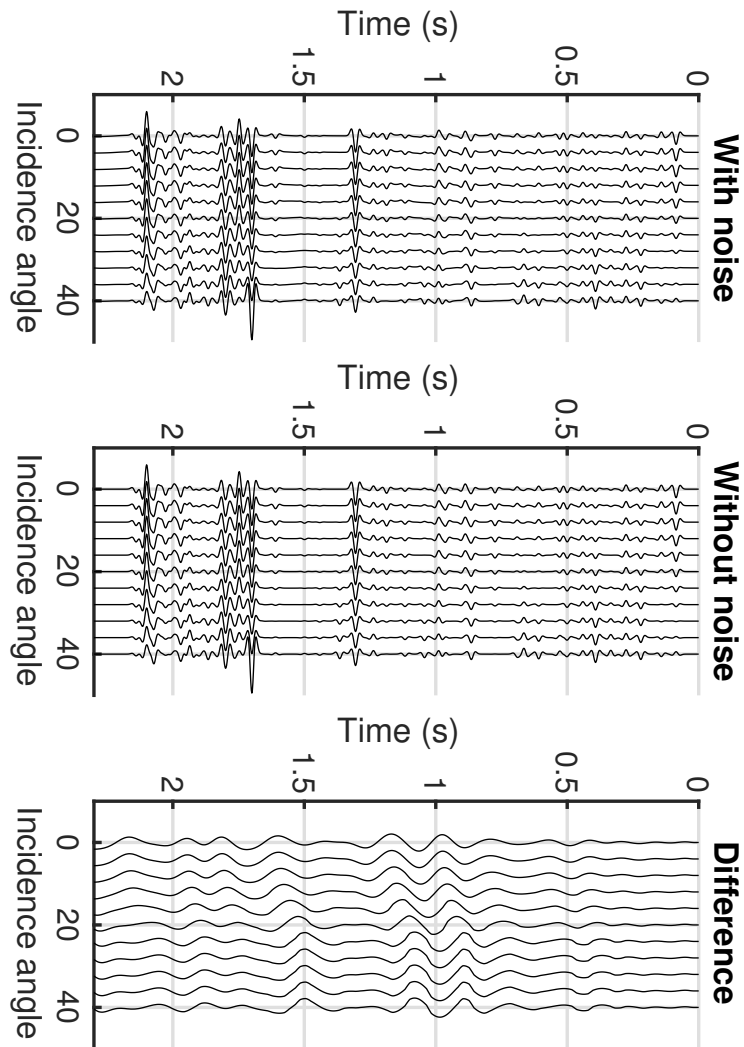


Figure 22: Gathers with and without random heterogeneities as noise.

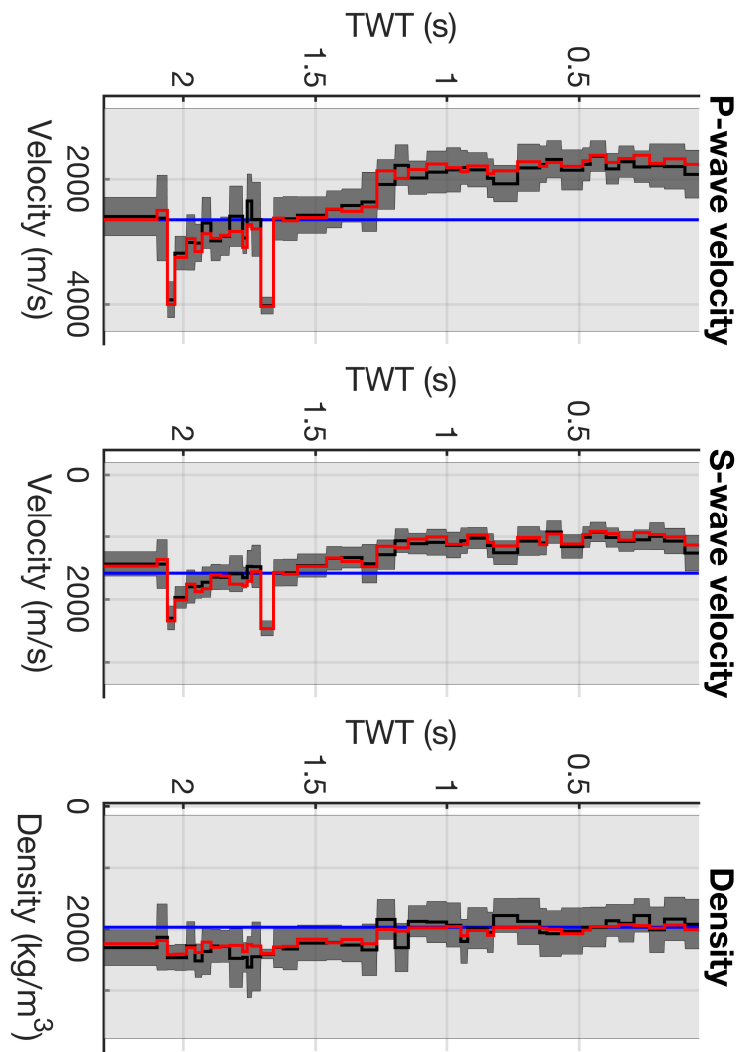


Figure 23: Results using random heterogeneities as noise.

Combination of noise

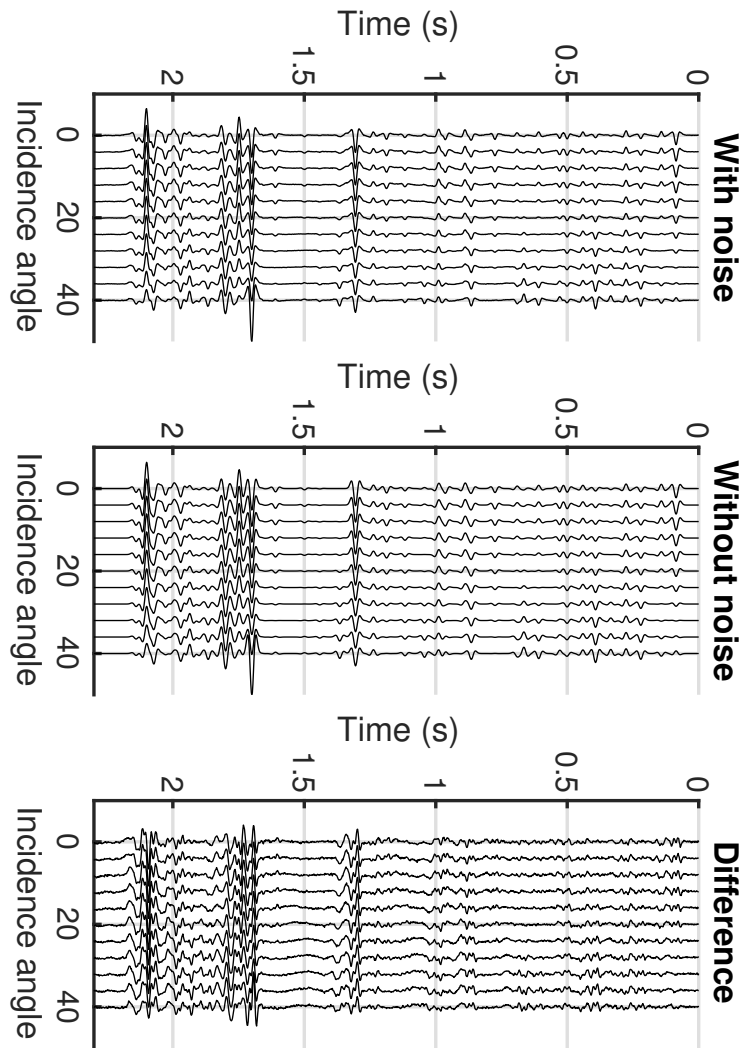


Figure 24: Gathers with and without the combination of noise.

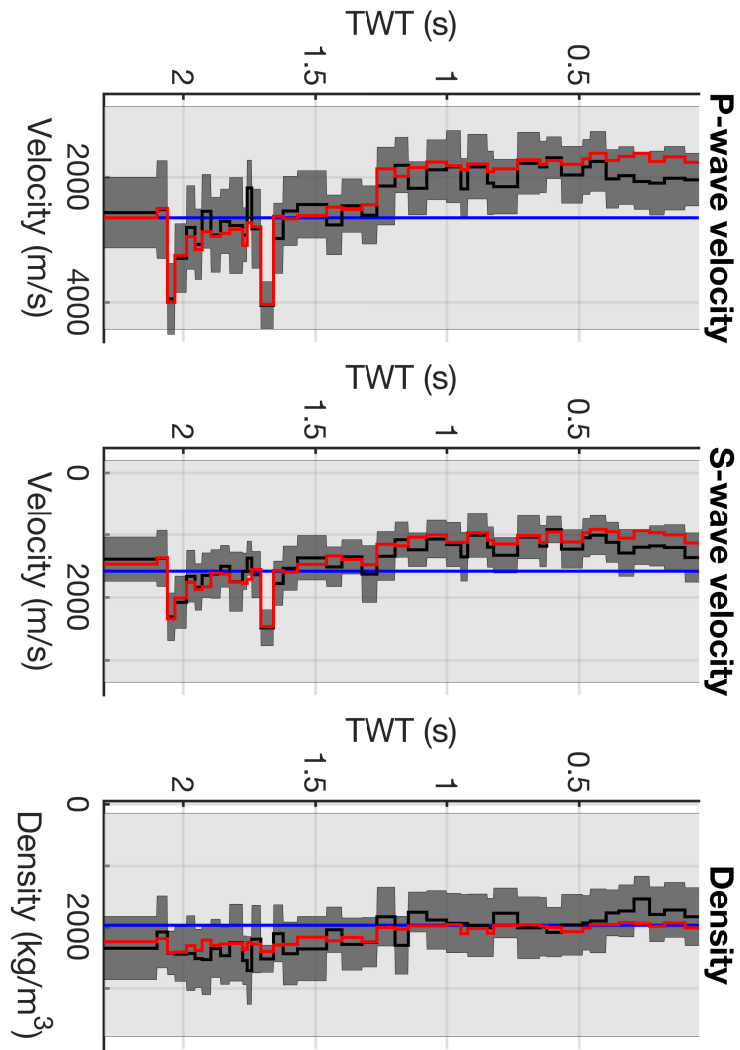


Figure 25: Results using the combination of noise.

Prior model 1 (CIP gather shown in figure 6)

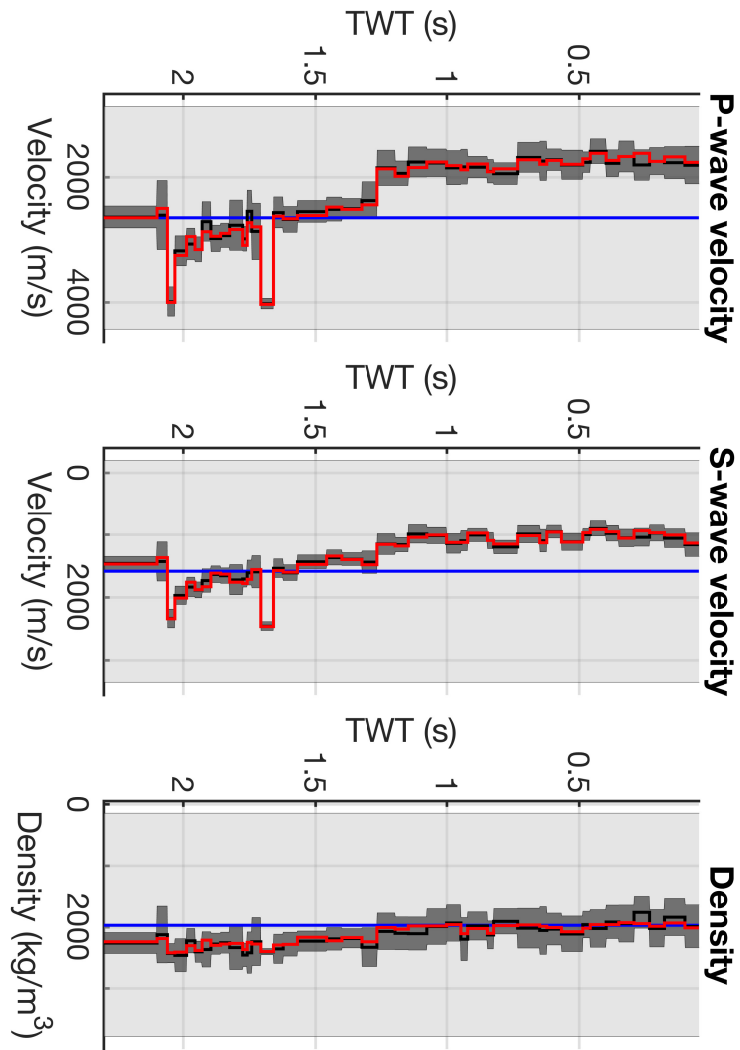


Figure 26: Results using prior model 1 and random Gaussian noise (SNR=15).

Prior model 2 (CIP gather shown in figure 6)

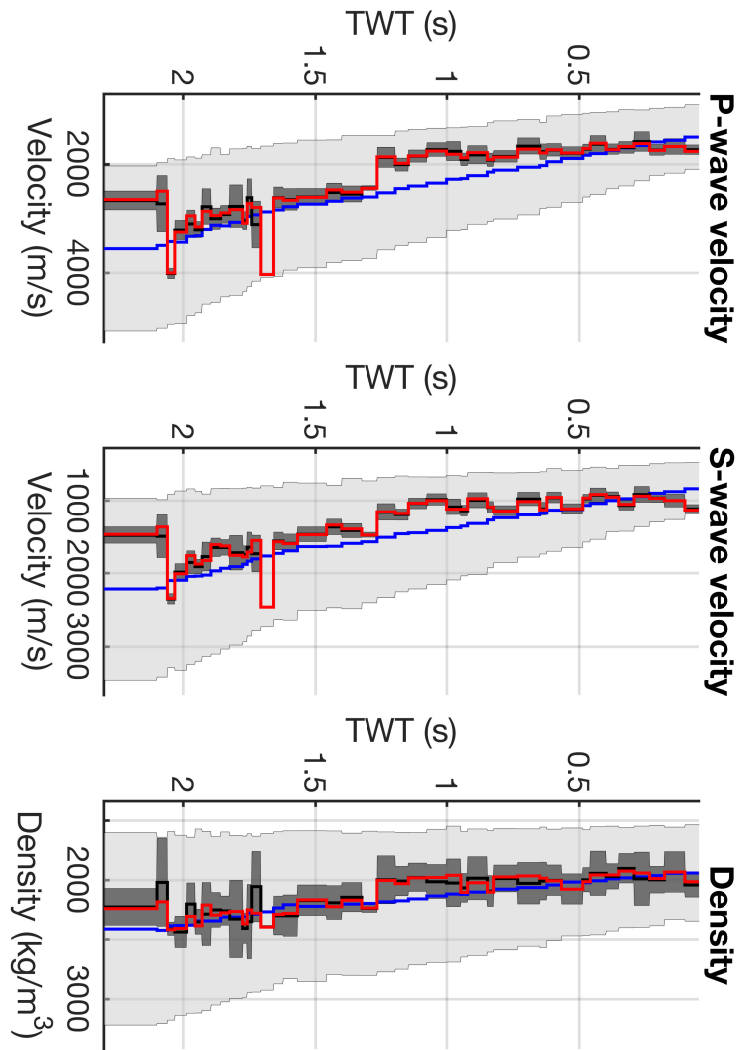


Figure 27: Results using prior model 2 and random Gaussian noise (SNR=15).

Combination of noise (correct estimated SNR=4.1) (CIP gather shown in figure 24)

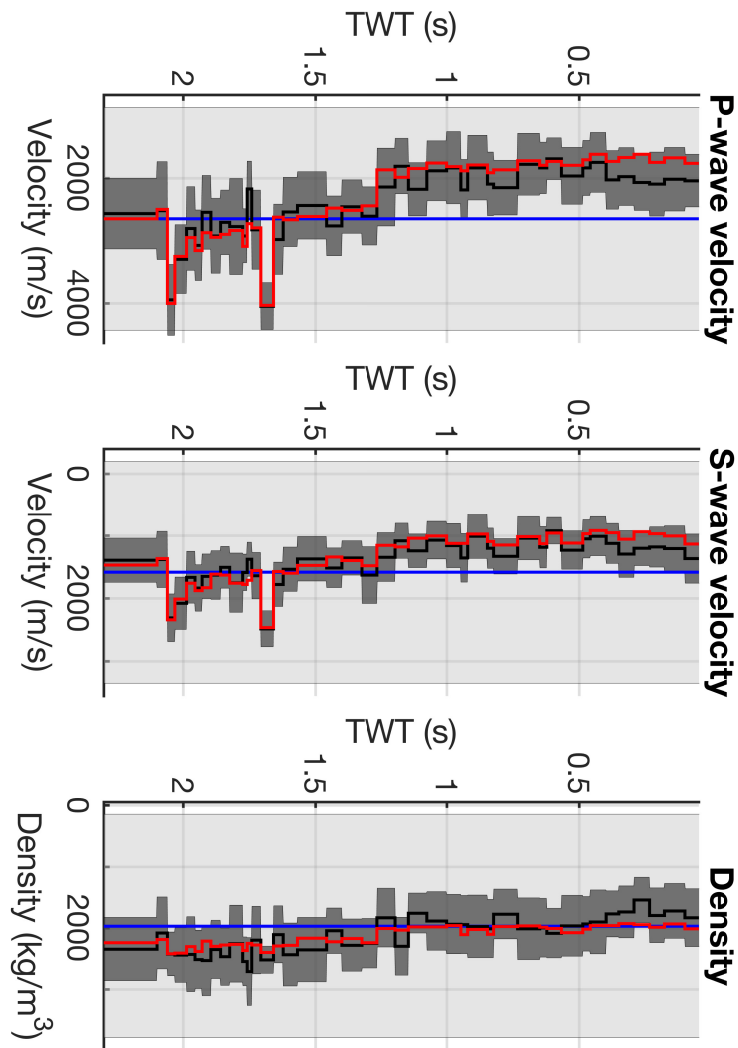


Figure 28: Results using the combination of noise with the correct estimated SNR=4.1.

Combination of noise (erroneous estimated SNR=8.0) (CIP gather shown in figure 24)

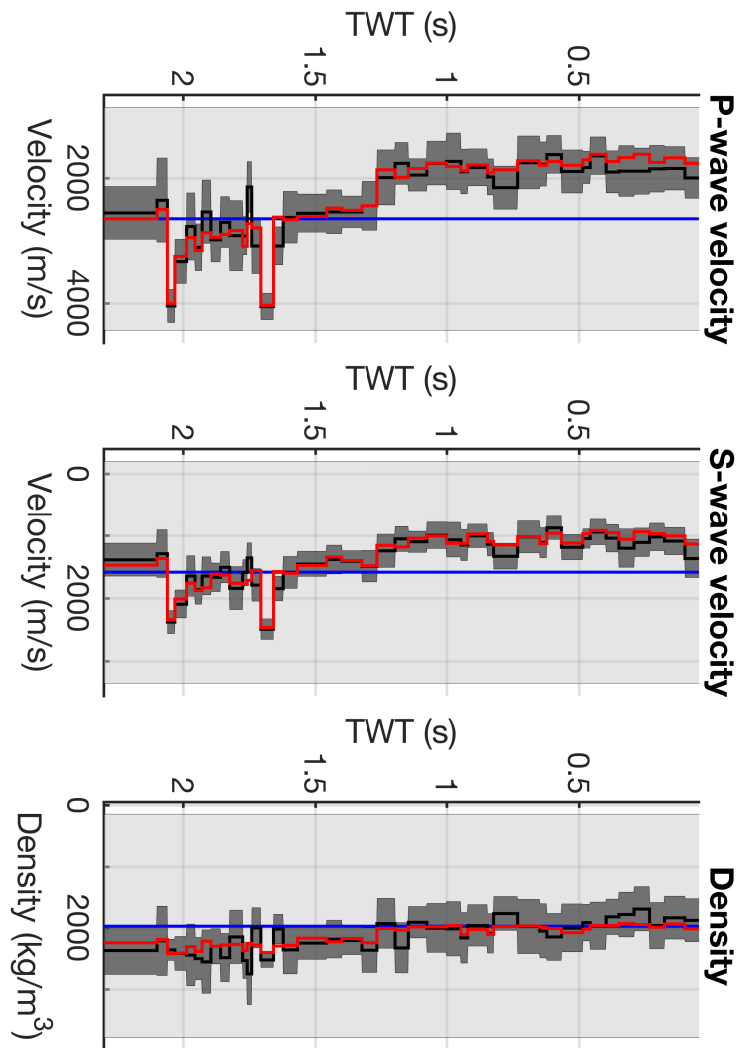


Figure 29: Results using the combination of noise with the erroneous estimated SNR=8.0.

Combination of noise (erroneous estimated SNR=3.5) (CIP gather shown in figure 24)

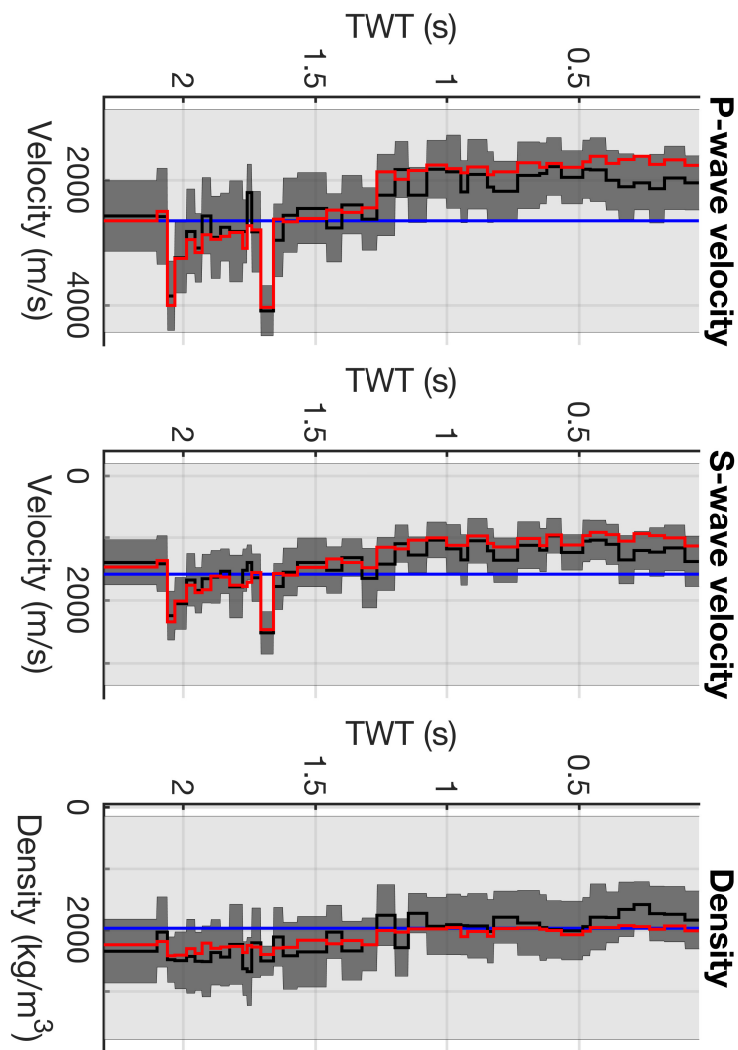


Figure 30: Results using the combination of noise with the erroneous estimated SNR=3.5.

Combination of noise (erroneous estimated SNR=2.0) (CIP gather shown in figure 24)

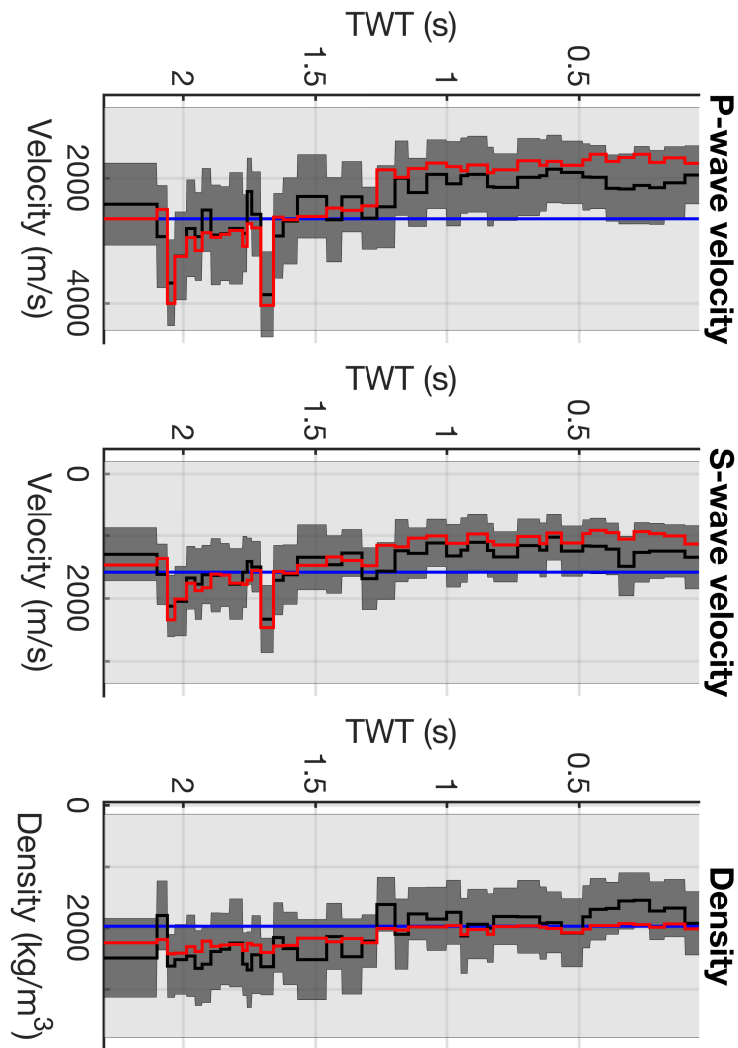


Figure 31: Results using the combination of noise with the erroneous estimated SNR=2.0.

Two assimilations (CIP gather shown in figure 6)

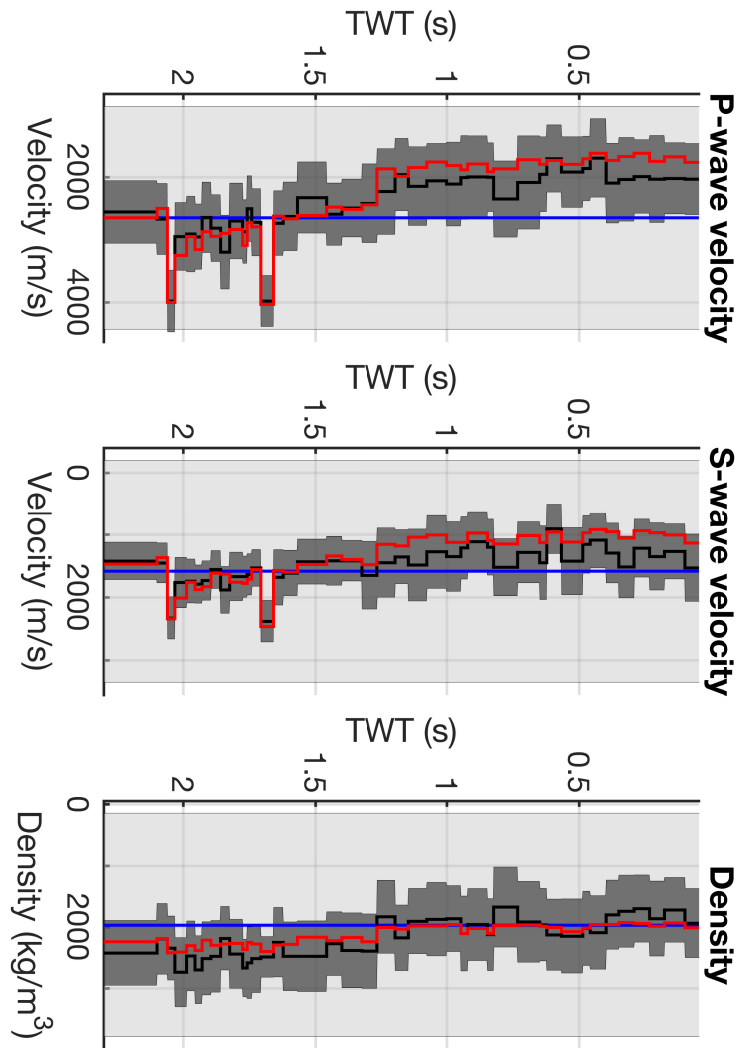


Figure 32: Results using two assimilations and random Gaussian noise (SNR=15).

Five assimilations (CIP gather shown in figure 6)

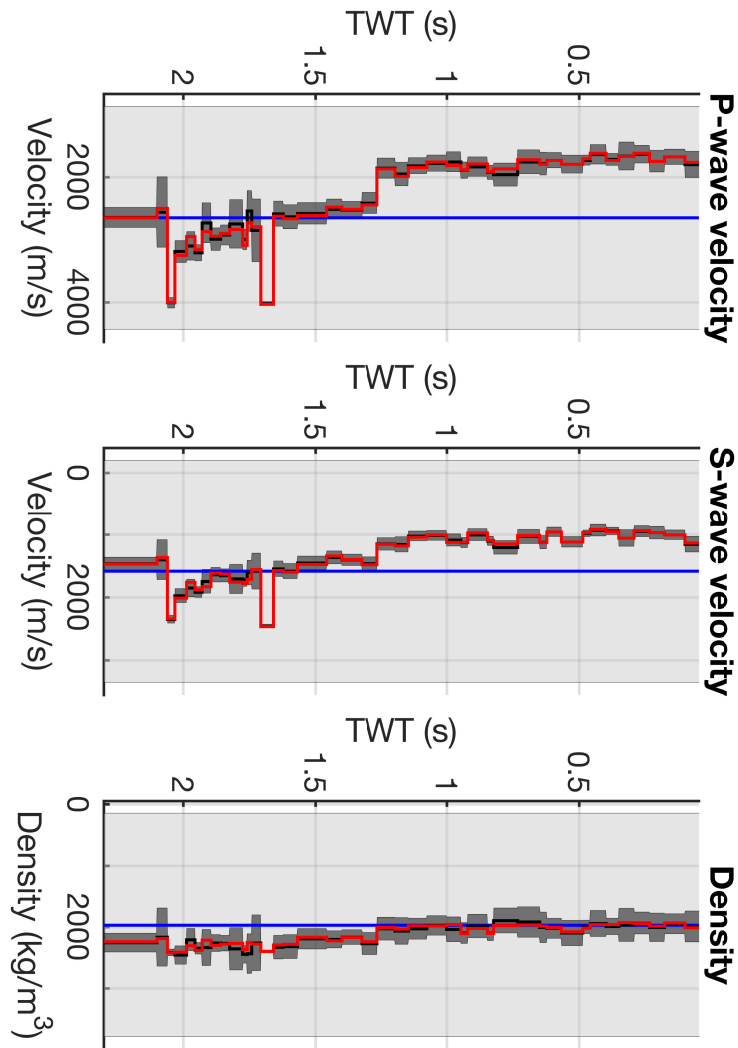


Figure 33: Results using five assimilations and random Gaussian noise (SNR=15).