

# **Noise Attenuation in seismic reflection (*Huge science & Big challenge*) Case Study**

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## **ABSTRACT**

One of the main steps in seismic data processing is data denoising. Seismic data signal is usually confused with a large variety of noises. This complexity makes enhancing the signal to noise ratio (SNR) very challenging. In seismic reflection, each type of signal that does not belong to the reflection hyperbola considered as noise to be attenuated.

An adequate denoising flow is mandatory. Where the filtering steps should be data driven and amplitude preserving. Here many quality control tools are present.

In this case, we worked on raw data where signal was highly confused in noise. The processing flow starts with median based filters that can remove high amplitude anomalies by comparing the samples from a trace with the median value. Then, frequency dependent filtering where we can eliminate high amplitude noise in decomposed frequency bands. There is also the modelization of linear noise such as the recorded pseudo-Rayleigh waves (called Ground roll) to subtract subsequently from the data. This modelization carried out by defining the range of velocity and frequency of this linear noise. Finally random noise attenuation applied for the entire signal's component frequencies; this to ensure signal preservation at the same time optimized random noise attenuation.

Lastly, a simple comparison between the raw and final data can show the precious performed effort while choosing the adequate parametrization of filters in all the seismic processing flow.