

## NEW SEISMIC ACQUISITION TECHNIQUES AND TECHNOLOGIES: OPPORTUNITIES AND CHALLENGES

**F. BABAIA, A. Zeffanine, B. Salamat**

**Algeria, Entreprise Nationale de Géophysique (E.NA.GEO)**

In recent years, the industry has seen an increasing use of High-Productivity & Broadband vibroseis survey methods (Slip Sweep, DS4, Dynamic Slip Sweep and Blending acquisition).

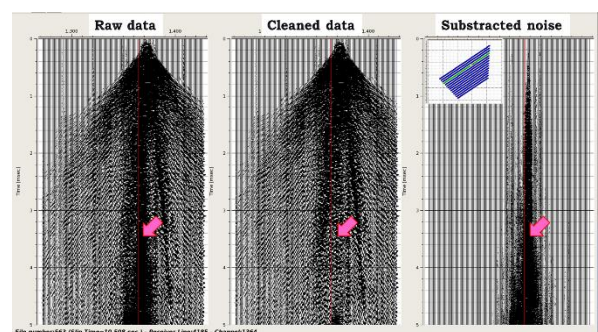
High quality seismic data is a significant contributing factor to the success of exploration efforts. The essential task of ENAGEO is to provide more accurate and higher resolution images of the subsurface from a variety of fronts including advances in broadband data recording, simultaneous sources, full-azimuth 3-D, higher channel counts, wireless systems.

Seismic data acquisition is being challenged in different ways that's why ENAGEO has taken the first step by investing in new acquisition technologies, by acquiring a new recording systems that improving the productivity which provide high quality and high density seismic images (more data–more azimuths, more density, more channels, more frequencies), allowing a reduction in costs and delays.

Innovation is one of our core values and we strive to deliver innovative solutions for our partners that bring value to their operations. With reduced downtime and by providing a safer work environment.

For this purpose, ENAGEO has formed Single sources/Single Receivers Seismic Mega-crews with more than 100,000 digital sensors and more than 20 heavy vibrators with high performances at low frequencies. Thus, quality control is ensured by High Performance Computing machines (HPC) on which automated QC procedures take place in order to process the large volume of seismic data acquired per day and which can be measured in TB.

In order to reduce the cost of acquisition of dense seismic volumes in vibro-seismic, high productivity methods have been adopted, in particular, Slip Sweep, D-T Rule or dynamic Slip Sweep and Blending Acquisition. ENAGEO proprietary solutions have been developed to reduce the harmonic noise generated by the use of said methods.



*Figure 01 : Harmonic Noise Removal*

Also significant efforts have been made in investment on the vibrators as well as the development of software solutions to generate custom sweeps allowing the vibrators to go lower at low frequencies down to 1 Hz. On the receiver side, the use of 0 Hz accelerometers and 05 Hz geophones contributes to preserving the low frequency content of the data.

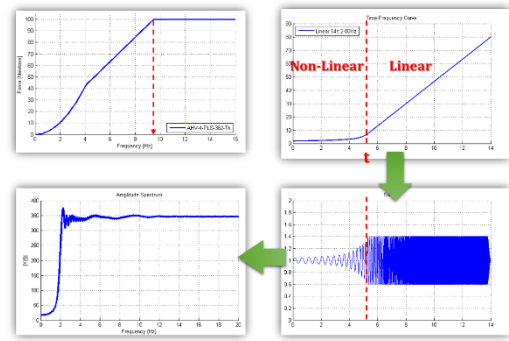


Figure 02: Custom sweep Generation

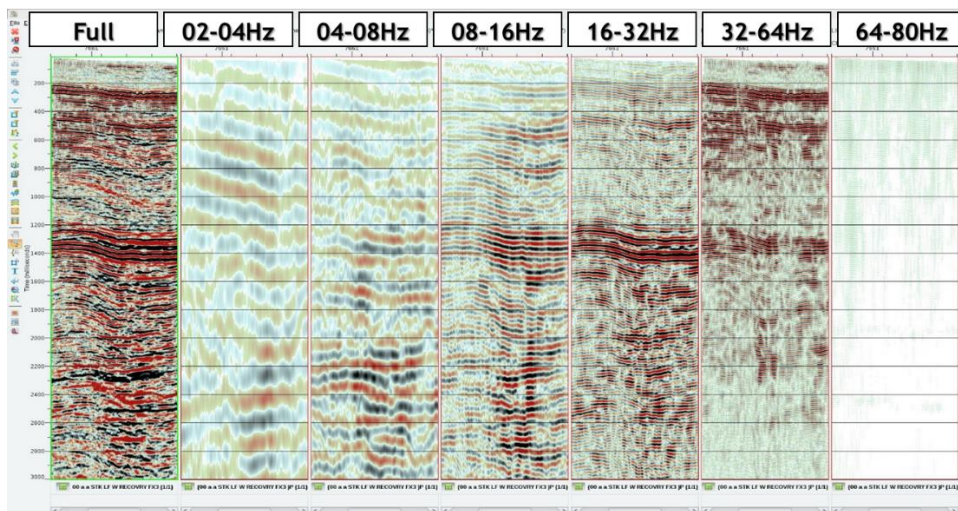


Figure 03: Low frequency stack decomposition