Multichannel seismic survey in coastal Campania area by two different resolution sources

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We present an example of seismic processing of datasets acquired in the Gulf of Naples in 2008 during the oceanographic cruise CAFE_07, on board of the R/V URANIA of the CNR.

This dataset could play a key role in understanding the stratigraphic-structural setting and the major offshore volcanic features in Pozzuoli Bay.

The survey consisted of a grid acquisition of ca. 800 km of high-resolution multichannel reflection seismic profiles, working in parallel with two source systems and hydrophones operating simultaneously at different frequency ranges.

Data processing, aimed at reduction of random noise in the data, included removal of unwanted coherent events and reduction of spatial aliasing by means of trace interpolation on common shot gather. The combination of pre-stack DMO and post stack data migration allowed a better localization of the reflectors on the seismic section. Cycles of velocity analysis and residual static corrections improved the quality of the velocity function and therefore, of the NMO correction. Pre-stack spiking deconvolution widened the frequency spectra of the signal and boosted data resolution. FK filtering on NMO corrected data, CDP gathers and pre- and post- stack predictive deconvolution weakened multiple reflections. Trace complex attributes were then performed to improve the continuity of the seismic horizon.

This processing sequence was applied to both high and low frequency datasets. Finally, the two datasets were merged obtaining the highest vertical and horizontal possible resolution was obtained.