Geophysical exploration of the West Sardinian continental margin and Sardo-Provençal oceanic basin (West Mediterranean Sea)

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The Sardo-Provençal Basin and its eastern continental West Sardinian margin represents one of the less explored Italian sea. During the year 2010 the OGS-Explora acquired a new dataset (W-Sardinia_2010) represented by seismic reflection and CHIRP profiles, Multibeam swath bathymetry and Magnetic data. The acquisition was designed on the base of results provided by previous profiles of the MS (Mediterranean Sea), CROP (CROsta Profonda) and ViDEPI (Visibility of Petroleum Exploration Data) projects.

Integration of all the different dataset allowed us to interpret the main geological structures produced during the Upper Oligocene-Lower Miocene, when the rifting phase was followed by the oceanic opening of the West Mediterranean Sea.

On the continental margin exploration reaches the whole sedimentary sequence, down to the geological basement showing the horst and graben system produced by the extensional tectonics (Geletti et al., 2014).

On the oceanic abyssal plain the MS and CROP profiles depicted some deep reflectors, generally ascribed to the top of the basaltic basement. The new W-Sardinia_2010 dataset, due to its higher resolution, highlights very clearly the Messinian evaporate sequence, characterized by the typical Messinian trilogy (Rehault et al., 2004).

The evaporate sequence is represented by *i)* a high amplitude stratified upper unit (UU, mainly gypsum lithology), *ii)* a transparent salt unit (MU, characterized by strong halokinetic tectonics), and *iii)* a stratified lower unit (LU, also represented by gypsum). This trilogy onlaps the lower continental slope, disappearing toward east, substituted by the erosional truncation (MES, for Margin Erosional Surface: Lofi et al., 2011) locally evident also in the Sardinia onshore.

The Plio-Quaternary sequence was highly deformed, especially during the Lower Pliocene, by halokinetics. In some local conditions this process is still active, producing some circular structures in the sea bottom, well imaged in detail by the CHIRP and multibeam data.

The different resolution of the available data represents the best condition to study the whole sedimentary sequence and to correlate deep structures with their local effect on shallow youngest sediments.

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