

SEISMIC IMAGE OF THE EASTERN EDGE OF THE BAY OF BISCAY: MARCONI DEEP SEISMIC REFLECTION PROFILES

Gallastegui, J. (1), Fernández Viejo G. (1), Pulgar, J.A. (1), Gallart, J. (2) & MARCONI Team.
(1) Dept. of Geology, University of Oviedo. c/ Jesús Arias de Velasco s/n 33005 Oviedo, Spain. jorge@geol.uniovi.es. (2) Inst. "Jaime Almera" CSIC. Fernandez-ViejoLuis Solé y Sabarís s/n 08009 Barcelona, Spain

The Bay of Biscay is the result of the northward propagation of rifting and sea-floor spreading in relation with the opening of the North Atlantic Ocean during Late Jurassic-Cretaceous times. The newly formed Cantabrian Margin (S of the Bay of Biscay) remained stable until the beginning of the Cenozoic when the convergence between the Iberian and Eurasian plates lead to the building of the Pyrenean-Cantabrian Mountains and the partial closure of the Bay of Biscay. Most of the deformation and shortening of this Alpine event concentrated in the Cantabrian margin whilst the Armorican conjugate margin in the N remained almost not deformed. Convergence lasted approximately from upper Eocene to lower Miocene and stopped at an early stage, making this area a unique place to study the initial stages of deformation of a previous passive margin.

In summer 2003, 11 multichannel deep seismic reflection profiles were acquired in the MARCONI seismic experiment, aboard the Spanish *R/V Hespérides*, providing a new 3D image of the structure at the south-easternmost part of the Bay of Biscay. The deep seismic reflection lines were acquired between the longitudes 6° and 2° W in a net of E-W (parallel to the strike of the main episode of deformation) and N-S (perpendicular to the convergence direction) profiles.

The structure of the eastern Cantabrian margin is characterized by a thick sequence of Cenozoic sediments (up 3 s TWT) partially deformed by northward vergent Alpine thrusts and related folds. The kinematic analysis of growth structures in the syntectonic Cenozoic units allows the detailed establishment of the tectonic evolution of the margin. Some remarkable Mesozoic basins were imaged below the Cenozoic sediments. They show features such as normal faults and asymmetric basins from the Late Jurassic-Early Cretaceous rifting stage and inversion structures related to the Eocene-Miocene compression. Lateral changes from E to W in the geometry of the structures, coinciding with two important North-South striking submarine canyons, suggest the development of lateral and/or transfer structures.

The overall crustal structure of this part of the Bay of Biscay has been interpreted as thinned continental crust underthrust under the extremely steep North Spanish continental slope. Magnetic data indicates that the oceanic crust of the bay is located to the W of the studied area. The new MARCONI multichannel seismic images, together with the coincident refraction/wide angle reflection data acquired during the cruise, give support to this interpretation and reveal the transition of the Pyrenean and Cantabrian structural units towards the eastern part of the Bay of Biscay.