Geophysical Research Abstracts, Vol. 7, 06215, 2005
SRef-ID: 1607-7962/gra/EGU05-A-06215

Analysis of the crustal structure and Ocean-Continent Trasition Zone in the Western Galicia Margin (Spain) from new marine gravity data.

M. Druet, A. Muñoz, A. Carbó, P. Llanes, J. Álvarez

Laboratorio de Tectonofísica Aplicada. Departamento de Geodinámica. Facultad de Ciencias Geológicas. Universidad Complutense Madrid. 28040. Madrid, Spain. (mdruet@geo.ucm.es / phone: +34 913944834)

The Western Galicia Margin (Spain) is a continental non-volcanic rifted margin, developed by the northward propagation of the Atlantic Ocean during Mesozoic times. The extensional tectonic during the Lower Cretaceous leaded to a principal normal fault system, oriented NNW-SSE, rooted on a great extensional detachment. This principal fault system is truncated by another two, respectively oriented NE-SW and NW-SE. During Cenozoic times, the convergence between Eurasian and Iberian Plates generated, northwards on this area, the development of compressive structures and the reactivation of previous extensional ones. As a result, several blocks, tilted during Mesozoic times, were uplifted and constitute the present area of submarine banks, the biggest of them being the Galicia Bank. To the west of this region of submarine banks, the Ocean-Continent Transition zone (OCT), few tens of kilometres width, is formed by a thin oceanic crust (2-4 km thick), underlined by a serpentinized peridotite bulk. Westward, this peridotite body rises to sea bottom as an elongated, margin-parallel, basement high, where the ocean-continent limit is traditionally located.

Here we present a Bouguer Anomaly map of the Western Galicia Margin, obtained from three cruises (ZEE-2001, ZEE-2002 and ZEE-2003) carried out between the years 2001 and 2003. A 2D spectral analysis of the map has been carried out with the aim to distinguish the wave lengths of the anomalies generated by upper crustal structures from those of deep-source anomalies. The results from this analysis have been used to develop a data processing in the frequency domain. Thus, Residual Bouguer Anomaly and Regional Bouguer Anomaly maps have been obtained, in order to de-

scribe the structure of the upper part of the litosphere and the morphology of the Moho, respectively. In the same way, the Euler 3D Deconvolution method has been applied, to determine the depth to the top of the geological sources that produce the observed gravity anomalies.

The high pass filter applied to the Bouguer Anomaly map, has allowed the observation of features that agree with the margin structure described before. The low pass filter of the Bouguer Anomaly map has permitted the observation of the wavy Moho morphology, which is found to a maximum depth under the region of submarine banks, where the continental crust is thicker. The obtained results, calibrated on the previous drilling and seismic data, allow analyzing the position and geometry of the structures and geological bodies described on the margin. This information is especially useful in order to resolve the limits of the OCT zone along the Western Galicia Margin. The boundary between continental and oceanic crust is one of the criteria used to define the extension of the continental shelf beyond the 200 nautical miles limit established by the United Nations Convention on the Law of the Sea.