2D Seismic Imaging of the Transition zone of the Cantabrian

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Abstract

The present work aims to reprocess a part of a series of seismic profiles ESCIN (Estudios Sísmicos de la Corteza Iberica Norte) acquired during the 1990's to study the structure of the Northern Iberian margin, on the transition zone between the Continental Platform and the Oceanic Platform at the northwest of Galicia. The ESCI-3.1 profile was selected for this work; this profile is characterized by a long gentle continental slope of approximately 110 km long, fault-bounded by Mesozoic events. The continental slope starts at a shallow depth around 200 m on the Continental shelf, providing sediments from the continental platform at a relative slow rate, finishing at the Abyssal plain at a depth about 4500 m. Right at the middle of the Continental slope, a process known as 'Submarine Land Slide', creates a vast accumulation of sediments from the tertiary. These tertiary sediments on the continental slope are denominated by low velocity, and then a strong velocity contrast is seeing with the more consolidated sediments from the Mesozoic that lay beneath. Along the continental slope, several normal extensional faults originated during the Mesozoic are identified. However, there are no signs that these Mesozoic faults have been reactivated. On the contact zone between the Continental Slope and oceanic crust, a tectonic accretionary prism is formed, due to partial subduction of the Bay of Biscay beneath the Iberian margin during the Cenozoic convergence. On the other hand, one of the main objectives of this work is to create a seismic section free of the Surface Related Multiple, in order to improve the velocity field of the survey area, to achieve this goal, a modern modeling technique known as SRME (Surface Related Multiple Elimination) is applied to a certain part of the profile, around the Abyssal plain. Finally, the work is concluded with an interpretation of the profile, identifying the main geological structures and processes in the area.