Geophysical Research Abstracts
Vol. 13, EGU2011-6746-3, 2011
EGU General Assembly 2011

Geomorphology of the Foix submarine canyon system, NW Mediterranean Sea

Xavier Tubau (1), Galderic Lastras (1), Miquel Canals (1), Oriol Veres (1), David Amblas (1), Xavier Rayo (1), Aaron Micallef (1,2), and Hermesione Shipboard Party (1)

(1) GRC Geociències Marines, Universitat de Barcelona, E-08028 Barcelona, Catalonia, Spain (glastras@ub.edu), (2) University of Malta, Msida, MSD 2080, Malta

The Foix canyon system is a 97 km long submarine valley that dissects the passive northeastern Iberian margin (NW Mediterranean Sea) from the Catalan continental shelf down to the Valencia channel. It consists of two highly sinuous branches (northern and southern) and two partially in-filled tributaries (Cunit and Valldepins canyons). In this study, we present the first integration of acoustic data from the Foix canyon in order to show its striking geomorphology. The dataset comprises very-high resolution swath bathymetry data (up to 4 m grid size) and TOPAS parametric seismic reflection profiles acquired onboard BIO Hespérides during MARINADA and HERMESIONE cruises in 2002 and 2009.

In order to perform the morphological analyses, the Foix submarine canyon system has been divided into upper, middle and lower course domains according to slope gradient, slope profile, sinuosity, degree of incision, and other morphometric and physiographic parameters. The heads of the two canyon branches, which incise the continental shelf up to 11 km off the coastline, are characterised by multiple and well-developed gully networks dissecting the canyon walls. These gullies exhibit contrasting morphologies and different degrees of incision and retrogression. The upper courses of the two branches are strongly meandering. The southern branch displays a characteristic U-shaped axial profile and hangs $\sim$230 m over the northern one. In turn, the northern branch shows several isolated, perched and stacked terraces. The partially buried Cunit canyon joins Foix canyon at its middle course, which starts where the two main branches converge. The lower canyon presents a very straight course when compared to the upper canyon, has a flat-bottomed thalweg, and is joined by Valldepins canyon at its lowest reach. The Foix canyon ends into the margin-parallel Valencia channel at a depth of 2200 m.

The objective of this study is to describe the Foix canyon, its tributaries and the neighbouring shelf, and to understand canyon shaping processes and their spatial relationships within each domain in order to ultimately constrain its geological evolution.