



Morphobathymetry and formation processes of sediment waves in the Gulf of Valencia continental slope (NW Mediterranean).

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Recently acquired swath bathymetry and seismic datasets revealed the presence of a series of very-large undulations over the Gulf of Valencia (GoV) continental slope. Such undulations have already been described in previous studies, interpreted as a result of sliding and/or creeping processes, presumably affected by neotectonic fracture system, which apparently produced mass movements along the continental slope. However, the analysis of previous data could have been misinterpreted similar to other case studies, such as the “Humbolt slide” (northern California) or the Landes Plateau slope.

In this study we present newly detailed morphological and geometrical analysis of the sediment undulations observed on the GoV continental slope. Morphological parameters and quantitative measurements of the undulations were computed, measuring the common geomorphic parameters from the multibeam dataset (i.e. wave-length, wave-height, asymmetry index, slope, etc.). In addition, seismic profiles were acquired at different resolutions across the undulations using TOPAS, Sparker and Airguns. The interpretation of the internal structure of such undulations indicated that they correspond to depositional sediment waves that affect a large portion of the continental slope sedimentary record, being preferentially developed in the three major fields separated by structural heights. The sediment waves formation processes has been inferred from contemporary hydrodynamics observations, which indicate that near-inertial internal waves interacting with the GoV continental slope could play an important role in redistribution of near-bottom suspended particles, contributing to the development and/or maintenance of such sediment wave fields.

This study will provide a new detailed characterization of the sediment waves observed over the GoV, and suggest a formation model that could be extended to similar sediment waves fields developed in continental slope regions elsewhere.