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Active tectonics related to major faults zone in the Alboran and western Algerian-Balearic basins.

P. Martínez-García, S. Perez-Hernandez, M.C. Comas and MARSIBAL I-06 Scientific Party

Instituto Andaluz de Ciencias de la Tierra. C.S.I.C. and University of Granada. Campus de Fuentenueva, Faculty of Sciences, University of Granada. 18002 Granada, Spain (matez@ugr.es).

New data from very high-resolution seismic profiling and sea-floor bathymetry were acquired during the MARSIBAL I 06 cruise, conducted onboard the R/V BIO HESPÉRIDES (December 2006). This contribution aims to present information on seafloor morphology and active tectonics shallow structures as it is shown by swath bathymetry (SIMRAD 120 record) and TOPAS profiles (ultra high-resolution profiles till 50-75 m penetration, primary frequency of 16-22 kHz).

In the Alboran basin we investigate the Alboran Ridge and the Yusuf fault zone. MCS profiles shows than the Alboran Ridge, the major NE-SW trending seamount of the Alboran basin, constitutes a folded positive flower-structure controlled by two left lateral strike-slip fault zones. Our high-resolution data indicate that active tectonics occurs at both bounding faults, but concentrated on the northern fault that border the Alboran Trough. Active near-vertical faulting lend to abrupt escarpments that are incised by gullies and small channels. Actual slumps, slides and small turbidite fans locate at the base of fault-escarpments. These features prove that active tectonic structures shape the Alboran Ridge. Ultra high-resolution profiles across the Yusuf fault zone, controlled by NW-SE directed strike-slip faulting, indicate that active tectonics also happen there.

A grid of high resolution seismic lines acquired across and along the Palomares margin (NW margin-segment of the Algerian-Balearic basin) indicates that shallow deformation at the Palomares Fault Zone mainly result from contractive wrench tectonics processes occurred from the Pliocene to present. In this area faults controls pathways

of two deeply incised, narrow submarine canyons (the Gata and the Aguas-Almanzora canyons). These turbidite systems drive erosion, mass transport, and sediment accumulation in this margin segment. Recent to active tectonics from faulting processes, which in turn produced both margin uplift and tectonic subsidence in the basin, have resulted in slides and slumps structures probably related to shallow earthquakes.

Our main results validate that seafloor morphology, shallow faulting, and sedimentary processes are controlled by widespread active tectonics in the Alboran and the western Algerian-Balearic basins.

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