Geophysical Research Abstracts
Vol. 14, EGU2012-12990, 2012
EGU General Assembly 2012

Tectonic Structure of the Imbricated Wedge of the Gulf of Cadiz (Gibraltar Arc) revealed from new seismic images of the Geomargen-I cruise.

C. R. Ranero (1), E. Gràcia (2), and T h e Geomargen-I cruise party ()

(1) Barcelona Center for Subsurface Imaging, ICREA at CSIC, ICM-CSIC, Barcelona, Spain (cranero@icm.csic.es, +34-(0)93-2309555), (2) Barcelona Center for Subsurface Imaging, UTM-CSIC, Barcelona, Spain

The Gibraltar Arc is fronted by an imbricated wedge of tectonic origin, possibly formed related to the subduction of a narrow segment of oceanic lithosphere under the Gibraltar Arc System. The wedge is the most outstanding structures of the Gulf of Cadiz, but its origin and activity are still a matter of debate. It has been proposed that the wedge is currently growing due to an ongoing subduction, whereas some other works propose that the wedge stopped activity during the Upper Miocene. The tectonic origin of the wedge is also debated, with propositions that it represents an accretionary wedge or a gravitational olistrostrome. Convergence and compressional deformation in the SW margin of the Iberian Peninsula has been ongoing since the Neogene, and it is currently driven by the slow NW–SE convergence (4-5 mm/yr) between the African and Eurasian plates. Convergence is accommodated across a broad, active deformation zone suggesting distributed deformation among a number of tectonic structures. Regional seismicity is characterized by shallow to deep earthquakes of low to moderate magnitude (Mw < 5.5), with earthquake mechanisms are dominated by reverse to strike-slip faulting styles. To study the structure of the wedge and analyze its recent/past activity, we have undertaken a seismic investigation. We present first results of the Geomargen-I cruise carried out onboard the Spanish RV “Sarmiento de Gamboa” during November 2011. The structure of the wedge has been imaged using a 6-km-long solid-state digital multichannel streamer with 480 channels (Sercel-Sentinel) and two, tuned G-II gun sub-arrays with a total volume of 4800 c.i. fired every 50 meters at 2000 p.s.i. (140 bar) pressure. We present a selection of post-stack time migrations of the multichannel seismic reflection profiles and high resolution bathymetry of the main tectonic elements of the wedge.