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Short Cruise Report

RV POSEIDON Cruise P393

Malaga, Spain – Faro, Portugal
14 January – 24 January 2010
Chief Scientist: Ingo Grevemeyer
Captain: Michael Schneider

Objectives

The evolution of the Western Mediterranean Sea and the Gulf of Cadiz is inherently governed by (i) plate convergence between Nubia (Africa) / Eurasia and (ii) subduction related slab-roll back. Both processes are responsible for the surface features / topography of the Alboran Sea / Rif / Betic domain and deep-seated features related to the consumption of African lithosphere. The cruise is part of the ESF-EUROCORES programme TOPO-EUROPE (Project TOPO-MED) and is aiming to study the interrelation between convergence and major tectonic fault zones in the Alboran Sea (Trans-Alboran-Shear-Zone – the Alboran Ridge) and in the Gulf of Cadiz and Miocene subduction, causing deep-seated seismicity (40-150 km depth) under the western Alboran basin. Furthermore, active tectonic features and fault zones will mimic the plate boundary configuration between Europe/Iberia and Nubia/Morocco. Monitoring networks with ocean bottom seismometers (OBS) were installed in the Alboran Sea and in the Gulf of Cadiz, recording local and regional earthquakes. Two deployment periods of approx. 6 month (in total one year) were conducted. In August of 2009 30 OBS were deployed during the RV *Poseidon* cruise P389. Instruments were recovered now during the *Poseidon* cruise P393 and have been re-deployed in the Gulf of Cadiz (Fig. 1). The recovery of OBS deployed in the Gulf of Cadiz stations will be the main aim of the RV *Maria S. Merian* cruise MSMS15/5, scheduled for July of 2010. During the deployment in the Alboran Sea the ocean bottom seismic instruments recorded a wealth of local earthquakes (see Fig. 1). The distribution of seismicity is going to outline tectonically active features and faults. In addition, data will be used for tomographic inversion, providing seismic constraints on the structure of crust and mantle in the Gibraltar arc / Gulf of Cadiz area and the Alboran domain. Furthermore, land based monitoring networks operated during the time of the marine deployments will provide a regional coverage of the entire area between Morocco and Spain, including the northern Moroccan continent and southern Spain.

Narrative of the Cruise

Poseidon left the harbour of Malaga, Spain with a delay of one day. Due to strong winds of 9 Bft. waves of up to 7 m height had been predicted for the Alboran sea. On Friday January 15, 2010, the weather has improved and weather conditions were good for at least the next four days. Poseidon left Malaga around sunrise at 8:20 local time and sailed straight to the deployment location of OBS16, OBS16 deployed in August 2009 during RV Poseidon cruise P389. The OBS was released on January 15, 2010 at 15:30 local time. At 15:50 h the first instrument was recovered. During the next three days we recovered all 30 OBS deployed during the first Leg of the programme TOPO-MED, Poseidon cruise P389. In general, recovery and later deployment was stopped during night time between 22 h and 6 h. The last station was recovered at 16:32 local time on Monday January 18, 2010. Thereafter, we started our transit into the Gulf of Cadiz. In the Morning of Tuesday at 8:20 local time the first

OBS, station 31, was deployed. Deployment continued for the next three days. The last station, OBS54, was deployed at 10.50 a.m. on Friday January 22, 2010. Poseidon headed towards Faro and reached the port in the morning of January 24, 2010.

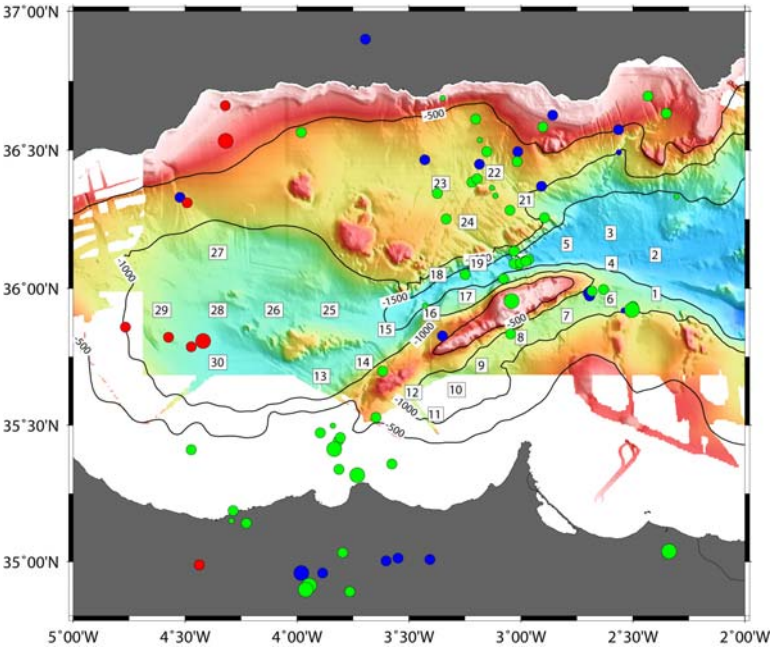

Fig. 1. Network of ocean bottom seismometers (OBS) recovered from the Alboran Sea and preliminary locations loal earthquakes of three month of analysed data.

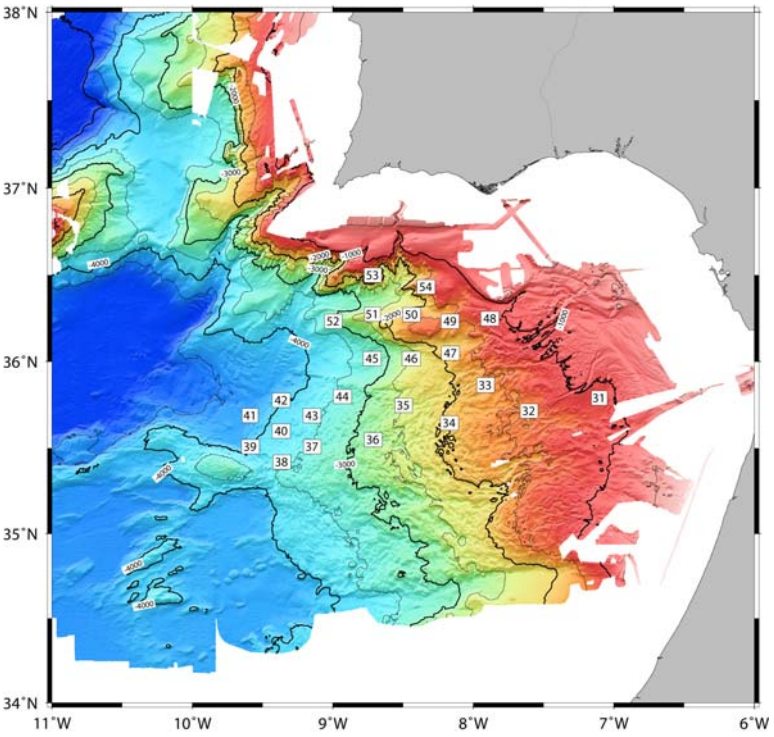

Fig. 2. Network of ocean bottom seismometers (OBS) deployed in the Gulf of Cadiz. The network will be operated until July of 2010.

Acknowledgments

We are greatful to Master Michael Schneider, and crew of the RV *Poseidon* for excellent sea-going support and a great working environment.

The ship time was provided by the Deutsche Forschungsgemeinschaft (DFG). The work conducted during the cruise MSM15/5 was supported by the European Science Foundation (ESF) EUROCORES programme TOPO-EUROPE and part of the TOPO-MED initiative. German efforts were funded by the DFG grant GR1964/12-1.

Cruise participants

Name	Discipline	Institution
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Brunn, Wiebke, scientist	OBS	IFM-GEOMAR
Dannowski, Anke, scientist	OBS	IFM-GEOMAR
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Station List

Ocean-Bottom-Seismometers (OBS) recovered (plotted in the order of recovery)

Station name	Latitude	Longitude
OBS 16	35°54.6'N	3°24.4'W
OBS 17	35°58.2'N	3°14.8'W
OBS 18	36°03.0'N	3°22.6'W
OBS 19	36°05.4'N	3°11.8'W
OBS 24	36°14.3'N	3°14.4'W
OBS 23	36°22.7'N	3°21.6'W
OBS 22	36°25.2'N	3°07.2'W
OBS 21	36°19.2'N	2°58.8'W
OBS 20	36°06.1'N	3°00.1'W
OBS 04	36°05.4'N	2°35.8'W
OBS 03	36°12.1'N	2°36.1'W
OBS 05	36°09.5'N	2°47.8'W
OBS 02	36°07.2'N	2°24.1'W
OBS 01	35°58.8'N	2°24.0'W
OBS 06	35°57.6'N	2°36.0'W
OBS 07	35°54.0'N	2°47.8'W
OBS 08	35°49.0'N	3°00.0'W
OBS 09	35°43.2'N	3°10.6'W
OBS 10	35°37.7'N	3°17.4'W
OBS 11	35°32.4'N	2°23.1'W
OBS 12	35°37.1'N	3°29.1'W
OBS 13	35°40.7'N	3°53.7'W
OBS 14	35°43.7'N	3°42.3'W
OBS 15	35°51.0'N	3°36.3'W
OBS 25	35°55.1'N	3°51.3'W
OBS 26	35°55.2'N	4°06.3'W
OBS 30	35°43.8'N	4°21.4'W
OBS 28	35°55.2'N	4°21.3'W
OBS 27	36°07.8'N	4°21.3'W
OBS 29	35°55.2'N	4°36.3'W

Ocean-Bottom-Seismometers (OBS) deployed

Station name	Latitude	Longitude
OBS 31	35° 47.6'N	7° 06.5'W
OBS 32	35° 43.0'N	7° 36.5'W
OBS 33	35° 52.0'N	7° 55.0'W
OBS 34	35° 38.8'N	8° 10.4'W
OBS 35	35° 45.0'N	8° 30.0'W
OBS 36	35° 33.0'N	8° 43.0'W
OBS 37	35° 30.6'N	9° 09.0'W
OBS 38	35° 25.2'N	9° 22.0'W
OBS 39	35° 30.6'N	9° 35.4'W
OBS 40	35° 36.0'N	9° 22.2'W
OBS 41	35° 41.4'N	9° 35.4'W
OBS 42	35° 46.8'N	9° 22.2'W
OBS 43	35° 41.4'N	9° 09.0'W
OBS 44	35° 48.0'N	8° 56.0'W
OBS 45	36° 01.0'N	8° 43.3'W
OBS 46	36° 01.0'N	8° 26.5'W
OBS 47	36° 02.9'N	8° 09.9'W
OBS 48	36° 15.0'N	7° 53.0'W
OBS 49	36° 14.0'N	8° 10.0'W
OBS 50	36° 16.4'N	8° 26.5'W
OBS 51	36° 16.5'N	8° 43.3'W
OBS 52	36° 14.0'N	9° 00.0'W
OBS 53	36° 30.0'N	8° 43.2'W
OBS 54	36° 25.9'N	8° 20.4'W