

Ingo Grevemeyer
GEOMAR | Helmholtz Zentrum für Meeresforschung
Forschungsbereich 4 / Abt. Marine Geodynamik
Wischhofstraße 1-3
D-24148 Kiel

Tel: +49 431 600 2336
Fax: +49 431 600 2922

Email: igrevemeyer@geomar.de

Short Cruise Report

RV POSEIDON Cruise P430

La Seyne sur Mer, France – Portimao, Portugal
07. April – 14 April 2012
Chief Scientist: Ingo Grevemeyer
Captain: Matthias Günther



Objectives

The Gulf of Cadiz and the Horseshoe abyssal plain to the south and southwest of the Iberian Peninsula are characterized by diffuse seismic and tectonic activity and the region lacks a clear plate boundary separating Africa from Eurasia/Iberia. The area hosted with the Great Lisbon earthquake of 1755 the largest European earthquake since historic earthquakes were reported. The exact location of the source of the 1755 Lisbon earthquake, however, is still unknown. Recent work may suggest that the event occurred in the vicinity of the Horseshoe fault, an oblique thrust fault at the westernmost boundary of the Gulf of Cadiz. The Horseshoe fault is cut by prominent features in the bathymetry – the so called SWIM lineaments. The SWIM lineaments are believed to facilitate fluid migration. The seismic work deployed in the area of the Horseshoe Fault has two main aims: (i) surveying the seismogenic potential of the area by yielding the minimum and maximum depth of seismogenic faulting and (ii) relating fluid seepage to seismically active faults. A small network of OBS was deployed during the RV *Poseidon* cruise POS430 in the Horseshoe abyssal plain and across the Horseshoe fault, recording local earthquakes over a time period of approx. 6 months. OBS shall be recovered with RV *Poseidon* during its cruise POS440 in October 2012.

Narrative of the Cruise

Poseidon left the harbour of La Seyne sur Mer, France on Easter Saturday April 7, 2012 at 18:40 local time. Due to strong northwesterly winds of 9-10 Bft. and waves with a height of up to 7 m *Poseidon* had to face very rough conditions during its first day at sea. In the afternoon of Easter Sunday April 8 the condition improved after *Poseidon* left the area where the Mistral and winds from the Pyrenees affected forcefully the sea state. Around noon on April 9 *Poseidon* passed the Balearic Island of Ibiza. On April 10 at about 10 a.m. *Poseidon* sailed around the Cabo de Gata and entered the Alboran Sea. Strong head winds of 7 to 9 Bft. and heavy waves slowed down *Poseidon*. After lunch time on April 11 conditions improved and *Poseidon* passed Gibraltar on 17:00 local time, entering the Atlantic ocean at approx. 20:00 local time. In the beginning of Thursday April 12 weather conditions in the Gulf of Cadiz were fine, however, approaching the deployment area wind speed increased again and reached state 7 to 8 Bft. At Thursday night at 22:58 local time (21:58 UTC) the first ocean-bottom-seismometer (OBS), station OBS01, was deployed (Figure 1). Deployment continued for the next 19 hours, deploying in total 14 OBS in the Horseshoe Abyssal Plain. Wind speed slowed down to 5 to 6 Bft. The last station, OBS14, was deployed at 6.09 p.m. on Friday April 13, 2012. Thereafter, *Poseidon* headed towards Portimao, reaching the Portuguese port in the morning of April 14, 2012. At 9:40 *Poseidon* was safe at the pier.

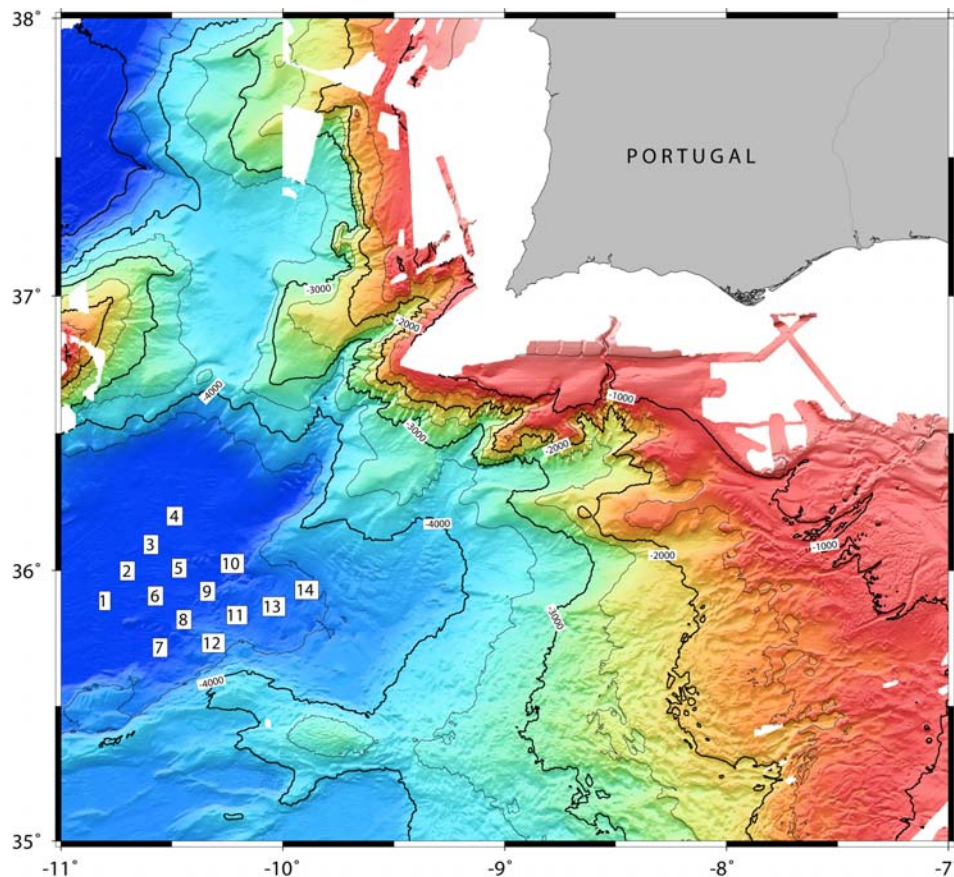


Fig. 1. Network of ocean bottom seismometers (OBS) deployed in the Horseshoe Abyssal Plain and across the Horseshoe Fault, recording local earthquakes over six month.

Acknowledgments

We are thank Master Mattes Günther, and crew of the RV *Poseidon* cruise POS430 for excellent sea-going support and a great working environment. The work conducted during this cruise was funded by the Deutsche Forschungsgemeinschaft (DFG) through grant GR1964/15-1.

Cruise participants

Name	Discipline	Institution
Grevemeyer, Ingo, chief scientist	OBS	GEOMAR
Lieser, Kathrin, scientist	OBS	GEOMAR
Möller, Stefan, scientist	OBS	GEOMAR
GEOMAR	Helmholtz Zentrum für Meeresforschung Kiel, Wischhofstraße 1-3, 24148 Kiel Germany	

Station List

Ocean-Bottom-Seismometers (OBS) deployed

<u>Station name</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Water depth [m]</u>
OBS01	35° 53,31' N	10° 48,68' W	4815
OBS02	35° 59,90' N	10° 42,25' W	4828
OBS03	36° 5,78' N	10° 35,84' W	4799
OBS04	36° 11,99' N	10° 29,34' W	4796
OBS05	36° 0,56' N	10° 28,21' W	4794
OBS06	35° 54,40' N	10° 34,64' W	4790
OBS07	35° 42,99' N	10° 33,45' W	4804
OBS08	35° 49,20' N	10° 26,95' W	4804
OBS09	35° 55,42' N	10° 20,55' W	4802
OBS10	36° 1,56' N	10° 14,13' W	4837
OBS11	35° 50,16' N	10° 12,88' W	4643
OBS12	35° 43,96' N	10° 19,33' W	4524
OBS13	35° 52,07' N	10° 2,99' W	4570
OBS14	35° 55,77' N	9° 54,11' W	4500