Geophysical Research Abstracts,
Vol. 11, EGU2009-5613-3, 2009
EGU General Assembly 2009

From Tides to Whale calls - Broadband ocean-bottom recordings from the Gulf of Cadiz

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NEAREST (Integrated observation from NEAR shore sourcES of Tsunamis: towards an early warning system) is an EC funded project (GOCE, contract n. 037110), which aims at the identification and characterization of potential near-shore sources of tsunamis in the Gulf of Cadiz. This area is well known from the catastrophic earthquake and tsunami occurred November 1st, 1755.

One of the project's work packages deals with monitoring of recent seismic activity in the Gulf of Cadiz area. For this purpose 24 broadband ocean-bottom seismometers (OBS) from the German DEPAS instrument pool were deployed for 11 months in addition to the GEOSTAR multi-parameter deep-sea observatory. The GEOSTAR observatory and the 24 OBS were deployed and recovered during two expeditions with RV Urania in 2007 and 2008. Broadband seismic signals were recorded with 100 Hz sample rate in water depths between 2000 and 5000 m. We recorded signals from very long periods (tides), oceanic and atmospheric signals, teleseismic, regional and local earthquakes, active seismic surveys, up to low-frequency vocalizations of most probably fin and blue whales.

A proper way to identify different sources of seismic signals is the use of spectrograms. An important question is, if whale callings on seismometer components were not previously misinterpreted as harmonic tremors (related to methane release etc.) and other "interesting" seismic phenomena. We want to stress the importance to identify and characterize biological sources of seismo-acoustic signals before interpreting "unknown" types of seismic events in ocean seismic recordings.