ANTARES SEISMOLOGICAL STATION: ANALYSE OF 2 YEAR CONTINOUS RECORDING

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In the frame of the Antares neutrino telescope project developed in Liguria Sea, an opto-electrical cable was installed to provide power and data transmission from the cost to the recording point at 2550 m depth and 15km south to Porquerolles Island. This gave us the opportunity to install a broad band seismological sensor and a pressure gauge providing data in real time to the coast. The instrument was deployed by the ROV "Victor" from Ifremer and partially buried; levelling and orientation was performed directly on the site. The instrument was running from April 2005 to April 2007. In April 2006 the sensor was retrieved and completely buried reinstalled.

2 years of data are analysed in terms of noise on the sea floor; as commonly observed the noise on the sea floor is quite large. It is interesting to propose some characterization. It shows different behaviour in 3 frequency ranges. At high frequencies some very specific picks can be recognised and an effort is made to connect to the superficial structure beneath the sensor. At low frequencies, the noise is well correlated to the amplitude of the Liguria current present in the area. At intermediate frequencies the variations of noise are related to the height of the surface water waves and could be associated to the weather conditions.

A clear general decrease of the noise is observed after April 2006, since the sensor is much better buried.

We can also observe that the 2 horizontal components are often very well correlated at long period, indicating that the tilt of the sensor could be responsible of the larger component of the noise. The orientation of the polarigramme changes in time showing that this tilt is varying. This may be produced by the soft soil around the sensor or "a soft coupling" of the sensor.

Low-frequency vertical-component seismic noise can be reduced at seafloor seismic stations by subtracting the coherent signals derived from (1) horizontal seismic observations associated with tilt noise, and (2) pressure measurements related to infragravity waves. These noise corrections at low frequencies, proposed by Crawford and Webb, must be very carefully carried out because of the tilt variations.

PERMANENT (OBS ALBORAN) AND LONG TERM (RED FOMAR) OBS

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The Eurasian-African plate boundary crosses the called "Ibero-Maghrebian" region from the San Vicente Cape (SW Portugal) to Tunisia including the south Iberia, Alboran Sea, and northern of Morocco and Algeria. The low convergence rate at this plate boundary produces a continuous moderate seismic activity of low magnitude and shallow depth, where the occurrence of large earthquakes is separated by long time intervals. In this region, there are also intermediate and very depth earthquakes. To study this complex area, the Royal Naval Observatory in San Fernando (ROA) and the Universidad Complutense de Madrid (UCM), with the collaboration of GeoForschungZentrum of Potsdam (GFZ), have deployed the Western Mediterranean Broad Band seismic network (WM), with stations located in southern Spain and Northern Africa, surrounding the Alboran sea and the Gulf of Cádiz. Due to the fact of that many events are located at marine areas and the pour geographic azimuthal coverage at some zones provided by land stations, the WM network will be complemented with a deployment of several broad band Ocean Bottom Seismometers (OBS) in the Gulf of Cádiz and the Alborán sea.
One permanent OBS will be deployed in the vicinities of Alborán island (OBS Alborán) and four long term (three years) temporal OBS's will be deployed at the Gulf of Cádiz and Alborán sea (Red FOMAR), with the support of the Spanish Navy facilities (ships, divers,…). All them have been funded by the Spanish "Ministerio de Educación y Ciencia" under the projects RIOA05-23-002 and CGL2005-24194-E.

In this work we describe the present status of the OBS deployment, and the future planned steps, in the frame of the Western Mediterranean (WM) network activities.