Autonomous Ocean Bottom Seismometers Signal Transmission

Fig. 1. Ocean Bottom Seismometer (OBS)

Applications of deep underwater seismometers are not only restricted to seismological studies, and whether these sensors can potentially be applied to a wider range of cases such as assessing the terrain physical properties, monitoring stability at coastal and shelves-margins areas, state of the art in civil engineer works, continuous awareness of natural hazards including gravity slides, tectonically triggered earthquakes, and sudden releases of methane from gas hydrates, etc. The results of previous measurements have shown that it is essential to r revise a whole range of aspects relatied to electronics and the desing of electronic-cartridge components if grater versality is to be reached: Optimisation signal/ noise ratio, systematic signal processing, clock stability and time precision, on-line control, and the ability to look after the whole system including the recording packages when it moves down to the seafloor.

Up to 80% of the failures in submarine systems occur in the first three hours after deployment. Therefore, for long-term deployment, it is necessary to control the functioning of the system shortly after it has reached the sea bottom. Moreover, the implementation of online monitoring will certainly increase the feasibility of the system, and, in many aspects, facilitate useful information to take *real time* decisions concerning logistics and possible reorganisation of the exploration.

The new design will incorporate a mechanism wich will be able to communicate permanently with the sensor whether it is under water or at the surface. In this way it will be possible to know where it is and what it is doing at any given moment. To achieve this objective it is essential to reduce power consumption and to evaluate (filter) the occurrence of reverberations and spreading on time and frequency.

Cormorán, development of a new mobile and autonomous ocean observation platform

The Coastal marine environment is an extremely complex system, characterised by strong links between its physical and chemical processes and biological population. Thus, the knowledge of the coastal marine environment requires interdisciplinary studies implying simultaneous sampling of physical, chemical and biological variables. Traditionally, oceanographic ships constitute the most relevant observational platforms to carry out interdisciplinary studies. Their high operational costs however, prevents data with the required spatio-temporal resolution from being obtained. Moorings, alternative platforms to oceanographic ships in coastal areas, provide data with high temporal resolution but spatially they are poor. Recent alternatives to these platforms allowing oceanic observations with higher spatio-temporal resolution, are the Autonomous underwater vehicles (AUVs) and Autonomous Surface Vehicles (ASVs). Among these platforms, only AUVs can be considered truly operational. However, they are expensive and, for this reason, are not widely used.

Fig. 2. Autonomous Surface Vehicle (ASV)

This project proposes developing a low cost ocean observing platform, hybrid between AUVs and ASVs, that is, a platform wich will be able to move on the sea surface and also dive to make vertical profiles of the water column by following a previously plotted route. Both of these aspect of the platform, would reduce production costs and increase efficiency. The development of the technology required to increase the time spent in the sea and the platform's autonomy, as well as the transmission in real time of the observations and diagnostics of the actual platform is also proposed. Finally, the assimilation of the data obtained from the platform, into a numerical coastal model will be considered in order to build a coastal predictive system which will help in the management of the coastal marine environment.