Geophysical Research Abstracts, Vol. 7, 06239, 2005
SRef-ID: 1607-7962/gra/EGU05-A-06239
© European Geosciences Union 2005

Low-frequency finback whale calls recorded offshore the Galicia Margin, North Atlantic Ocean

O. Gaspà, **J. Díaz** and J. Gallart

Dep. Geofísica i Tectònica, Institut de Ciències de la Terra ' Jaume Almera' IJA-CSIC, Solé i Sabaris s/n. 08028 Barcelona, Spain. (ogaspa@ija.csic.es)

Between August 23 and September 21 2003, ten OBS from IRD-Géosciences Azur were deployed about 250 km offshore the West coast of Galicia (NW Spain) as part of a multidisciplinary study of the zone where the oil tanker 'Prestige' sunk. OBSs were set to continuous recording mode of the three 4 Hz geophone components and, in most of the cases, one hydrophone. The area covered was roughly 0.3ºx0.3º wide, with distances between adjacent instruments in the range of 8-10 km.

The OBS records show a wide variety of seismic signals. Among them, a particular family of events can be identified by specific features such as: i) short and regular pulses of 0.5-1 s of duration, with a pulse interval of 12 s; ii) series of pulses of about 10 minutes separated by rest intervals, typically of 60-90 s; iii) narrow amplitude spectra ranging from 18 to 24 Hz, with a peak close to 21 Hz. Acoustic signals with these properties have previously been described as being generated by finback whales. The identification arise primarily from combined visual observations and recordings and is well established in the literature. Finback whales are the second largest animal on Earth, reaching up to 25 m and weighting up to 70000 kg. Their live in most of the oceans and usually move alone, in pairs or in small pods. They can reach 35 km/h even if their usual cruise speed is in the range 4-15 km/h. They usually move close to the surface but can dive down to 230 m depth.

In our experiment finback calls are not spread over the full deployment but happen to concentrate in the last two weeks. The use of a dense array of receivers has allowed to investigate the trajectories and velocities of the signal-generating whales using a classical hypocentral localization program (Hypo71), adapted for this special case. To study such trajectories we have localized individual pulses at different equally time-

spaced instants of the different sequences. The reference provided by the rest intervals has been used to ensure that the same pulse was chosen at each station. The problems related to the presence of more than one individual, as well as to the identification of arrivals of peg-legs or multiples have also been considered prior to localization. In most of the cases the whale seems to swim at speeds between 5 a 10 km/s, following trajectories that penetrate in the area covered by our array. In some cases the data show the presence of at least two different whales swimming independently.

These results illustrate that deployments of semi-permanent seafloor seismic arrays can be a valuable instrument not only for seismological purposes, but also to track and monitor the movements of finback whales and other marine mammals. Therefore, future geophysical projects that include long-term deployment of OBSs could be considered as challenges for more integrated bio-geosciences research.