For the corresponding instrumentation, this work included intercomparison between the bottom mounted ADCP Aanderaa DCM12 of the Pasaia station and a RDI WH600. Both were used for water profiling and surface tracking.

Moreover, the littoral patterns measured in Pasaia station have been compared to offshore patterns observed with the recently moored buoy offshore Donostia (from January 2007). The understanding of coastal particularities can be a key point for improving hydrodynamic modelling [4] [5]. In that context, the observing system will be implemented in 2008 with the addition of a high frequency radar system, which will provide information of current field, with a resolution of 6 km.

References:

MULTIFRACTAL ANALYSIS OF SAR OF THE OCEAN SURFACE, CURRENTS, EDDY STRUCTURE, OIL SLECS AND DIFFUSIVITY ANALYSIS

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1. Introduction
The use of Synthetic Aperture Radar (SAR) to investigate the ocean surface provides a wealth of useful information. Here we will discuss some recent fractal and multifractal techniques used to identify oil spills and the dynamic state of the sea regarding turbulent diffusion. The main objectives is to be able to parametrize mixing at the Rossby Deformation Radius and aid in the pollutant dispersion prediction, both in emergency accidental releases and on a day to day operational basis. Results aim to identify different SAR signatures and on the same time provide calibrations for the different local configurations that allow to predict the behaviour of different tracers and tensional liquids in the sea surface diffused by means of a Generalized Richardson’s Law [1-3]. The diffusion of oil spills and slicks in the ocean (Figure 1) have been also investigated using the same multifractal techniques developed by [1, 3]. Different cases are studied analyzing mixedness, and multifractality [2].

2. Results and Discussion
Experimental and Geophysical observations are investigated with multiscale fractal techniques in order to extract relevant information on the spectral characteristics of mixing and diffusive events. Both density and tracer marked oil spills and slicks are investigated in detail using third order structure function analysis that indicates strong inverse cascades towards the large scales producing spectral variations [4]. The different local mixing processes are compared by mapping their different multifractal scaling. Several uses of this new technique are proposed [5-8] taking advantage of Zipf’s Law, both for anthropogenic oil spills and other features, it is possible to predict the likely probability of oil spill accidents of different sizes, as well as the local eddy characteristics that strongly influence the turbulent horizontal diffusivity, K(x,y).

(a) SAR ENVISAT frame.
(b) detail at higher resolution

Both numerical simulations [4] and laboratory experiments confirm the conditions for hyperdiffusion (D 2 = c t n(f,N) with n(f,N) > 3 ) to exist, as well as the trapping associated with coherent structures and vortices in the ocean, which are well detected under the Weilburn distribution of prevailing winds in the NW Mediterranean Sea.
3. Conclusions

By using the multifractal “Box counting Algorithm” and a suitable non-dimensional Damkholer time, based on the local dissipation in the ocean surface, it is possible to estimate the local values of horizontal eddy diffusivity and to deduce the persistence of oil spills and skicks in the ocean. The eddy structure and local characteristics are invaluable when a prediction of tracer or surfactant path has to be made. In current numerical models that do not account for the strong spectral content at $R = N \times h/f$, with $N$ the Brunt Vaisalla frequency and $f$ the Coriolis parameter, only Gaussian order predictions are available, on the other hand intermittency and higher order dose and persistency predictions are needed for practical remedial situations.

4. References


A SIMPLIFIED MODEL FOR BOTTOM TRAWL FISHING GEARS

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Keywords: Bottom trawl fishing gears, numerical simulation, modelling

Bottom trawl fishing gears are complex systems in which the different constitutive components (net, sweeps, otterboards and warps) are intimately coupled. Information on gear response has been traditionally inferred from empirical experience and scaled prototypes in flume tank experiments (Fiorentini et al. 2004). In addition to empirical studies, a number of theoretical models of increasing complexity have also emerged in parallel with the development of computational capabilities (software DYNAMIT, IFREMER, 2000).

A simplified model of the gear that mainly affects to the net is proposed (Folch et al. 2007). The model is constrained to steady towing conditions, flat seabed and gear symmetry. Simulations provide a number of relevant outcomes like distribution of tensions at the warp, balance of forces at the otterboards or spread under different haul conditions such as depth or towing speed. Based on the above, the objective of the present study was to describe and implement the model and thus to predict the consequences of changing some gear components. This objective could have been fulfilled through extensive sea trials to cover all the different haul conditions of interest.

As a preliminary test, we use experimental data from a set of the