Mesoscale activity in the Catalan Current (NW Mediterranean) from May 1987 to December 1989

Jordi FONT

Institut de Ciències del Mar (CSIC), 08003 Barcelona (Spain)

In the frame of a research project on shelf/slope frontal dynamics in the NW Mediterranean (Spanish CAICYT PB86-0628), a current-meter mooring was maintained from May 1987 to December 1989 near the shelf break off the Ebro delta (40°43'4"N, 1°21'34" E). This site has resulted to be representative of the general southwestward flow in the region (Font, 1990) and very close to an area where an energetic mesoscale filament has been described (Wang et al., 1988).

One of the aims of this current study was to identify the occurrence of mesoscale events as perturbations of the general circulation in periods from 3 to 20 days. Aanderaa RCM7 current-meters were deployed at -15, -50 and -100 m with a sampling interval of 30 min. and an instrument maintenance about every two months. In total 85% of good data were recovered.

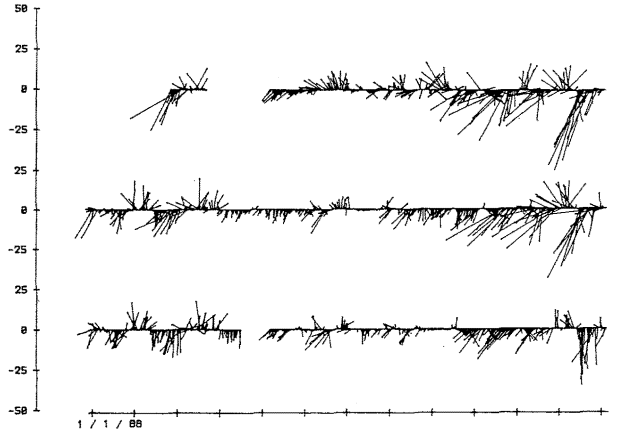

Fig. 1 Low-passed currents (33 h filter) at the three levels sub-sampled every 24 h, for the period 1 January - 31 December 1988

A first estimation of the mesoscale activity has been done with the same method used by Taupier-Letage & Millot (1986) in the Ligurian Sea: the variance of the two components of the velocity vector has been calculated by 20-day periods shifted 10 days, for the whole set of data. Low-passed and daily subsampled currents (fig. 1) were used for this calculation.

The three levels show a similar behaviour during the three years of observations, especially the intermediate and deep current-meters. After a quiet summer period, a sudden increase in mesoscale activity takes place by mid October (fig.2) and is maintained until the end of December. During winter the activity slowly decreases and a secondary and narrower maximum appears in June. The filament observed by Wang et al. (1988) in 1986 would correspond to one of these short active periods.

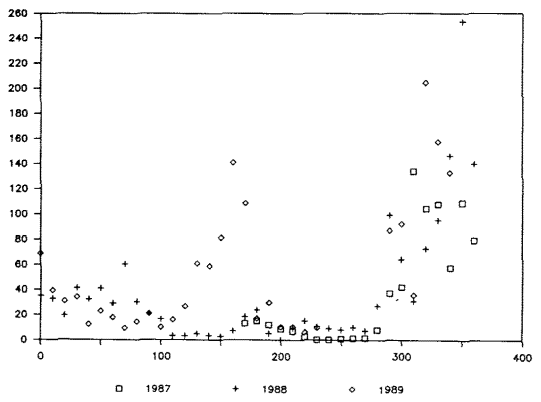

Fig.2 Mesoscale activity in cm^2/s^2 at -50 m for the three years

Font J. (1990) A comparison of seasonal winds with currents on the continental slope of the Catalan Sea (NW Mediterranean). J. Geophys.Res., 95: 1537-1546

Taupier-Letage I. and Millot C. (1986) General hydrodynamical features in the Ligurian Sea inferred from the DYOME experiment. Oceanol.Acta, 9(2): 119-131

Wang D.P., Vieira M., Salat J., Tintoré and La Violette P.E. (1988) A shelf/slope frontal filament off the northeast Spanish coast. J.Mar.Res., 46: 321-332