

The interaction between the Catalan and Balearic Currents in the Southern Catalan Sea, FE91 Cruise (May 1991)

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The circulation in the Catalan sea is dominated by the Catalan current, a continuation of the Liguro-Provençal current along the continental slope, in geostrophic equilibrium with a typical shelf/slope front (WANG *et al.*, 1988). On the Balearic islands side there is another front which delimitates the incursion of southern mediterranean waters with lower salinity of Atlantic origin (SALAT & CRUZADO, 1981). These two main dynamic features interact in the southern half of the Catalan sea (CASTELLON *et al.*, 1991).

The FE91 Cruise was a part of the "Flotadors Errants" series of cruises to contribute to the knowledge of the mesoscale features associated to the circulation in the Western Mediterranean. During May 1991, the southern half of Catalan Sea was covered with a net of CTD casts (Fig. 1), ADCP measurements and TS surface continuous analysis along the ship track, and a synoptic coverage of AXBTs. Samples for organic micropollutants and radioactive tracers were also obtained at several points. In this paper, the main preliminary results concerning circulation are presented, while some of the information is still under elaboration.

Summary of Results

The shelf/slope current suffers two important deflections (Fig. 2): the first at a change of the slope orientation at 40°30'N 1°40'E, and the other at 39°30'N 1°E. At this point, the main flow is definitely detached from the slope and a residual flow continues attached towards the Gulf of València to reach the Eivissa channel.

The circulation over the wide shelf between these two points is anticyclonic, dominated by inertial oscillations (SALAT *et al.*, 1992). It plays a role of a trap for the Ebro river discharges (Fig. 2). At the open sea side, in the northern point appears a clear signature of a cyclonic eddy that may deviate, towards open sea, part of the shelf/slope waters and also help the propagation of filaments of shelf water described by WANG *et al.* (1988).

The southern waters of Atlantic origin appear in the upper 100 m at the eastern side of Eivissa channel (Fig. 2) forming a well defined anticyclonic eddy. A remarkable surface front is detected in the northern side of this eddy, when it contacts the deflected Catalan current at 39°30'N. As the southern waters are lighter, the water coming from the north sinks and passes underneath.

The organic micropollutants have two main sources: one in the northern coast (Cap Salou) and the other in the southern coast (out of the map). The maximum concentrations of those compounds are found in two zones: one in the wide northern shelf, accumulated by the anticyclonic circulation there, and the other associated with the entrance of southern waters.

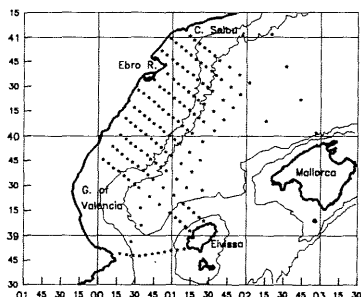


Fig. 1. Map of the studied region showing the CTD stations and bottom topography (200 and 1000 m)

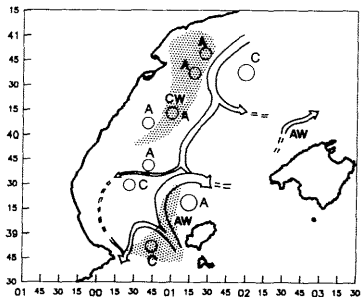


Fig. 2. Summary of results:

Schematics of circulation and position of eddies (circles)
A: Anticyclonic,
C: Cyclonic.

Water mass distribution:
CW: Continental influence
AW: Atlantic influence

Shaded area:
Maximum of organic micropollutants

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