

Winter Surface Circulation Variability in the Balearic Basin

Maria Jose LOPEZ *, Claude MILLOT ** and Jordi FONT ***

* Dep. Geografia, Univ. VALENCIA (Spain)

** Centre Oceanologie de Marseille, LA SEYNE (France)

*** Inst. Ciencies del Mar, BARCELONA (Spain)

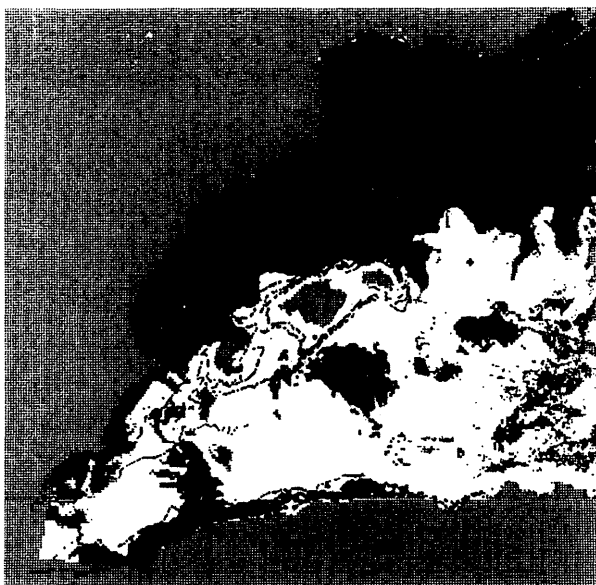


Fig. 1.- sea surface temperature of the Balearic and surrounding basins on 3 February 1990 derived from AVHRR NOAA

During the EEC MAST1 program, the EUROMODEL project has been investigating the processes and forcing mechanisms that drive the circulation in the different regions of the Western Mediterranean. Special attention has been devoted to seasonal variability, the scale of the main driving processes.

The Balearic basin is an area where two different regimes interact: the thermohaline driven circulation of the Liguro-Provençal basin and the large-scale eddy dominated Algerian basin. A series of AVHRR-NOAA images for the autumn-winter period during 1981-1990 has allowed the study of several aspects of the structure and circulation of its upper layer. This study is part of PRIMO, the International Research Programme in the Western Mediterranean.

During the stratified season warm waters occupy the surface mixed layer with a northern boundary delimited by the action of the strong winds in the Gulf of Lyon. This boundary extends to the east, and depicts the most intense surface thermal front observed in the Mediterranean. The progressive erosion of the thermocline allows the observation of the current that follows the continental slope from the north to the Gulf of Valencia. This is the final section of the Liguro-Provenço-Catalan current, the flow that characterises the circulation of the northwestern Mediterranean.

Near the Balearic islands, the irruption through the sills of recent MAW, transported by anticyclonic eddies from the Algerian current, creates the Balearic front and contributes to its mesoscale variability. The latter appears to be much more intense than previously described. Figure 1, a typical winter image, shows this front being continued to the east by the well known North-Balearic front, the feature that usually delimits the northern extension of recent Modified Atlantic Water.

This study was funded by EEC contract MAST-0043-C and CICYT project MAR89-0550. Economic support for travel and exchange was provided by a CNRS-CSIC cooperative project and the Conselleria de Cultura de la Generalitat Valenciana. CETIIS helped in image processing.

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