

NEW FEATURES IN THE CIRCULATION OF THE SURFACE WATERS IN THE BALEARIC AREA

Vélez-Belchi P. ^{1*}, López-Jurado J. ², González-Pola C. ³

¹ Instituto Español de Oceanografía, C.O. de Canarias, crta de San Andrés N°45, 38180, S/C Tenerife, Spain - * pedro.velez@ca.ieo.es

² Instituto Español de Oceanografía, C.O. de Baleares, Muelle de Poniente s/n, 07080 Palma de Mallorca, Spain - lopez.jurado@ba.ieo.es

³ Instituto Español de Oceanografía, C.O. de Gijón, Avda. Príncipe de Asturias 70 bis, 33212 Gijón, Spain - cesar.pola@gi.ieo.es

Abstract

The surface circulation around the Balearic Archipelago offers interesting new features as the control of the inflow of atlantic waters through the channels by the presence or not of Anticyclonic eddies in the southern part the archipelago. In the present paper, with the help of three surveys during the summers of 2001, 2002, 2003, this new features, together with others, are presented.

Keywords: surface circulation, Balearic Sea, Algerian eddies

Due to the importance of the Balearic islands as a barrier for the southern propagation of the northern colder waters and the northward propagation of the southern atlantic waters several observational programs has been working on that area [1]. In spite of that, there are still some unknowns. In the present study, and with the help of three hydrographic surveys carried out in the waters around the Balearic islands during the summers of 2001, 2002 and 2003, we will point out some features not observed before and some others not totally confirmed. In general, the observed situation confirms the Balearic Sea as a transitional region between the northward Atlantic waters and the southward Mediterranean waters, being characterized by intense frontal systems and an intense geostrophic circulation.

During the three years the northward path of the atlantic waters was controlled by the presence or not of atlantic anticyclonic eddies in the southern side of the archipelago. In summer 2001 (Fig. 1), there were two inflows of waters of Atlantic origin ($S < 37$), progressing northwards through the Ibiza and Mallorca channels and converging

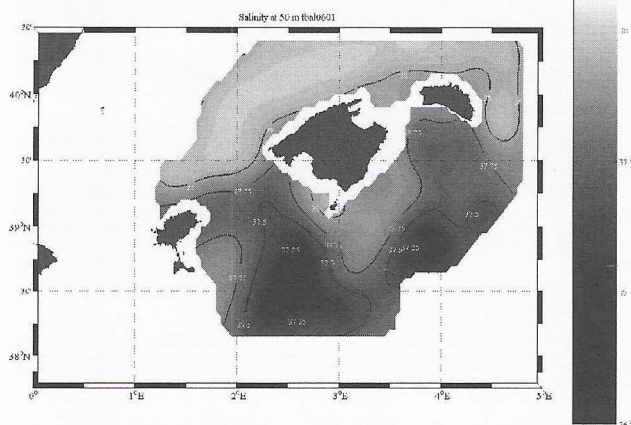


Fig. 1. Horizontal distribution of salinity at 50m during summer 2001.

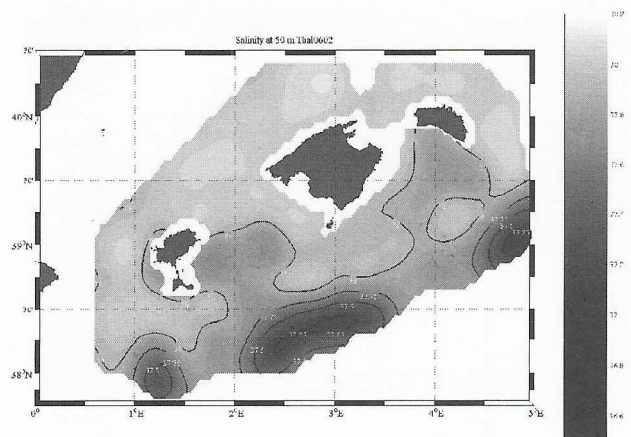


Fig. 2. Horizontal distribution of salinity at 50m during summer 2002.

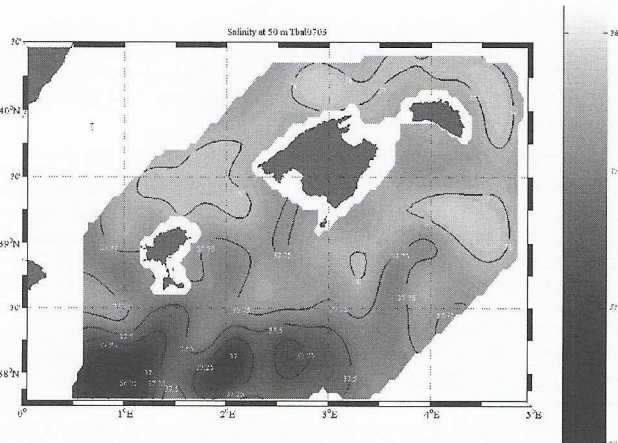


Fig. 3. Horizontal distribution of salinity at 50m during summer 2003.

at the north-east of Ibiza Island, where formed a density front is formed. On the other hand during the 2002 and 2003 summers the encounter of water masses of Atlantic origin with those of Mediterranean origin occurred in the south of the Balearic Archipelago, and consequently with low transport of atlantic waters through the channels. The northern part of the survey area, including the channel areas, was occupied with waters of Mediterranean origin. During these years, the intrusion of the superficial Atlantic water masses was hindered by two anticyclonic gyres in the southern and southeast region of the survey area (Figs. 2,3). Besides that, the south of Menorca was occupied by small eddies during the three years, therefore having good conditions for the spawning of Tuna [2]. A recurrent pattern also observed during the three years is the existence of deep eddies in the Mallorca channel, with clear influence of WIW, these eddies are probably trapped by topographic features in the Mallorca channel as the seamounts east off Ibiza.

References

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