

INVESTIGATION OF THE EASTERN MEDITERRANEAN BASIN BY UKRAINIAN OCEANOGRAPHERS DURING 1986-1991

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Abstract

Ukraine oceanographers carried out large series of cruises in the Aegean Sea as well as Ionian and Levantine Basins at same time that POEM cruises were carried out. The data collected in Ukrainian cruises contain unique information about processes of deep convection in the Eastern Mediterranean during winter 1987 as well as about the structure of the most energetic anticyclonic gyre, Ierapetra. Merging the Ukraine data with the POEM data collected in the Levantine Basin (summer 1990) produces a detailed pattern of the Mid Mediterranean Jet during the early stage of the Eastern Mediterranean Transient (EMT). Most of the data set is available now for the oceanographic community.

Keywords : Eastern Mediterranean, Circulation, Water Convection, Deep Sea Processes.

Experimental research of the Eastern Mediterranean by former USSR oceanographers led by Prof. I. M. Ovchinnikov (1931-1997) can be subdivided into two main stages. The first one is a series of basin wide cruises on the R/V "Vityaz" (1949-1979) that resulted in a comprehensive monograph "Hydrology of the Mediterranean Sea" [1]. The second one is a series of cruises on research vessels belonging to the Odessa Branch of the State Oceanographic Institute (1986-1991) and focused on investigation of sub basin circulation and processes. Unlike POEM results, which are published widely and are the major knowledge sources about sub basin Mediterranean circulation [3], the results of the second stage of the Mediterranean investigation by Soviet oceanographers are almost entirely unknown to the wide oceanographic community. The end of the second stage coincided with the collapse of the USSR, and results of those investigations have not been fully processed and were published very scarcely. However during the period from 1986 to 1991 Ukrainian oceanographers carried out about 3000 CTD casts, mostly in the Aegean Sea, Ionian and Levantine basins. The major contribution belongs to R/V "Jakov Gakkel" (64% from the total cast number) and R/V "Vladimir Parshin" (16%).

and Parshin 06, [2]). Unfortunately, because of circumstances independent of the authors, not all the data from these cruises is finally processed and available to the oceanographic community. But now all efforts are undertaken to solve this problem.

References

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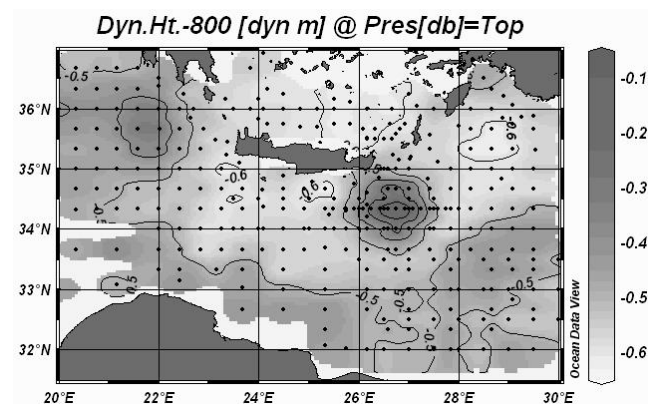


Fig. 1. Dynamic topography from merged data of Ukraine (Gakkel 38 and Parshin 06) and of POEM (LBDS02) cruises, summer 1990. Mid Mediterranean Jet path is following the -0.5 dyn. m. contour.

Unfortunately, the accuracy of the Soviet equipment used in these cruises (about 0.02° C for temperature channel and about 0.03 for salinity channel) was hardly sufficient to find out long-term changes of water mass parameters in deep layers which were connected then with the EMT [5]. However, for investigation of the upper 1000 m layer processes as well as of the intensive sub basin circulation (Fig. 1) one can neglect this data problem [6]. The most important scientific results of these cruises are: (i) first description of the deep sea convection event in the Rhodes Gyre region (winter 1987 - cruise Gakkel 28, [4]); (ii) detailed quantitative characteristic of the Aegean Sea water masses during the early stages of the EMT (winters 1988 and 1990 - cruises Gakkel 31 and 36, [8]); (iii) detailed description of genesis and development of the Ierapetra anticyclonic eddy (summer 1990 - cruises Gakkel 38 and Parshin 06, [7]); (iv) first detailed description of the intensive emission of the Cretan Sea water in the Eastern Mediterranean interior (summer 1990 - cruises Gakkel 38