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OBJECTIVE ANALYSIS OF GEOSTROPHIC CURRENTS IN THE ADRIATIC SEA

Nedžad LIMIĆ and Mirko ORLIĆ

Rudjer Boskovic Institute, Zagreb (Yugoslavia), and
Faculty of Science, University, Geophysical Institute, Zagreb (Yugoslavia)

A b s t r a c t

The first results of the objective analysis of geostrophic currents in the Adriatic Sea are presented. Data collected during the "Andrija Mohorovičić" cruise in September and October of 1974 are used for computing relative dynamic depths. These are then interpolated on a rectangular grid of points, using a first-order polynomial for approximating the mean depths, and applying both the isotropic and anisotropic autocorrelation functions. The objectively analyzed surface currents, computed relative to those at the 50 dbar surface, show a similarity with the results of subjective analysis only for the anisotropic autocorrelation function. It is concluded that detailed measurements are needed to assess the statistics of relative dynamic depths. Moreover, the problem of aliasing should be approached, and a method for transforming relative into absolute currents should be applied to the Adriatic Sea data.

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PRELIMINARY RESULTS OF THE MEDIPROD 5 EXPERIMENT

Claude MILLOT^o, Isabelle TAUPIER-LETAGE^o and Mejdoub BENZOHRRA^{oo}

^o Antenne du Centre d'Océanologie de Marseille, B.P. 330,
La Seyne (France)

^{oo} Institut des Sciences de la Mer et de l'Aménagement du Littoral,
Amirauté/Jetée Nord, B.P. 90, Alger (Algérie)

The multidisciplinary MEDIPROD 5 experiment (the Franco-Algerian component of the Western Mediterranean Circulation Experiment) was planned to study the stability of the Algerian Current, the structure of the associated eddies, the circulation of the Levantine Intermediate Water (LIW) and the biological consequences of the mesoscale hydrodynamical phenomena expected to occur in the Algerian Basin.

The Algerian ship "Ben Yahia" made several CTD campaigns in the coastal zone while the French ship "Le Suroit" deployed various sets of instruments in the whole basin during June 1986. Eight moorings with 3 or 4 current meters on each, set in place between 0 and 5°E, will be retrieved at the end of 1986. Two out of the 5 drifting buoys launched near the coast at 2°E, were still emitting in early September. About 160 stations were occupied with measurements (CTD, O₂, nutrients, fluorescence and plankton samplings) either discrete down to 800m or continuous in the 0-200m layer. These experiments were conducted with the help of infrared satellite images received onboard in near-real time from the Centre de Météorologie Spatiale in Lannion. During the June experiment the cloud-cover was rather important and the mesoscale phenomena were not as intense as previously observed; nevertheless, several interesting results have already been obtained.

As a general result, we have found very good relationships between satellite and in situ hydrodynamical data in sense that the mesoscale movements suggested in the infrared images were coherent with lagrangian and geostrophic currents.

CTD casts made a few weeks apart and the trajectories of the drifting buoys supported the fact that, as expected, the Algerian Current becomes more and more unstable when proceeding eastward.

A young anticyclonic eddy located near the coast and an older one located offshore, both revealed by the infrared imagery, were sampled: within both structures, isopycnets were clearly incurved down to 800m at least and, in particular, intense mesoscale currents were computed in the surface layers.

At the present time, the most definitive results probably concern the circulation of the LIW. Maxima of T and S were observed at depths ranging from 200 to more than 500m in the whole basin. But these maxima were less and less pronounced and the warm and saline layer was thinner and thinner when proceeding toward the coast. It is now obvious that no vein of LIW does follow the Algerian continental slope. Also, and as expected, the most pronounced maxima of T and S were encountered exactly inside the old anticyclonic eddy already mentioned: this clearly accounts for new LIW transported by the eddies (probably away from the Sardinian continental slope) and then released in the open basin.