O-IV8

The circulation in the Algerian Basin inferred from the Mediprod-5 current meters data set

Claude MILLOT

Antenne du Centre d'Océanologie de Marseille, B.P. 330, 83507 La Seyne (France)

New hypotheses about the circulation of the Modified Atlantic Water (MAW), of the Levantine Intermediate Water (LIW) and of the Deep Mediterranean Water (DMW) in the Western Mediterranean have been recently put forward (Millot, 1985, 1987-a). Those about LIW in the Algerian Basin have already been supported by hydrological measurements collected during the Médiprod-5 cruise in June 1986 (Millot, 1987-b). Twenty-four Aanderaa current meters, set in place on 8 moorings at nominal depths of 100, 300, 1000 and 2000m, during more than 9 months and from ≈0° to ≈5°E along the Algerian coast, have provided us with definitive information about the hydrodynamical characteristics of the various water masses in that region (Millot, 1988).

It is obvious from the analysis of this data set that the circulation in a ≈40-60km wide coastal zone is characterized by the occurrence of a very turbulent surface flow, namely the Algerian Current, and of mesoscale young eddies, the structure of which is markedly variable with depth. In the interior of the basin, currents display, at least between ≈300 and 2000m, a marked barotropic structure which accounts for a major influence of old eddies extending roughly down to the bottom. As it was already noticed (Taupier-Letage and Millot, 1988), these old-offshore eddies can interact with the Algerian Current itself (Taupier-Letage et al., 1988).

As already shown by satellite images, young-coastal eddies are advected eastward at a few cm/s. Therefore, the coastal moorings have been crossed by several eddies, and specially by a very powerful one which was located at ≈0° in June-July, and at ≈5°E in November-December. This eddy has induced very spectacular and intense currents which were, at a depth of ≈100m and during more than 1 month, directed seaward with an averaged speed of ≈25cm/s. Such mesoscale phenomena obviously have tremendous consequences on the biological activity in most of the Algerian Basin.

The temperature measurements collected with these current meters have also provided us with very interesting information. It is first important to note that the averaged potential temperatures of the 10 records collected at 1000 and 2000m are in the range 12.85-12.87°C and in good agreement with the available hydrological data sets, which accounts for the significance of the absolute temperature values measured with such instruments. Considering that the nominal depth of 300m lies between those of the temperature minimum (≈200m) and of the temperature-salinity LIW maximum (≈400-500m) leads us to emphasize differences between the coastal and the offshore regions. Near the coast, the temperature time series at all points look like a plateau ploughed by furrows (anticyclonic young-coastal eddies propagating eastward depress the various isopleths) while offshore, they resemble a plateau with abrupt domes (due to lenses of relatively new LIW, probably advected from the Sardinian continental slope by old-offshore eddies). Maximum intermediate values recorded in the offshore zone (13.81°C ± 0.1-0.2°C) are relatively large when compared to the largest ones ever observed either in the Sardinian Channel (13.8-13.9°C, Guibout, 1987) or along the Algerian coast (≈13.2-13.5°C), supporting the previous results on the important role played by the algerian eddies.

Guibout P., 1987. Atlas hydrologique de la Méditerranée. IFREMER Edit., 150p.

Millot C., 1985. Some features of the Algerian Current. J. Geophys. Res., 90, C4, 7169-7176.

Millot C., 1987-a. Circulation in the Western Mediterranean Sea. Oceanol. Acta, 10, 2, 143-149.

Millot C., 1987-b. The circulation of the Levantine Intermediate Water in the Algerian Basin. J. Geophys. Res., 92, C8, 8265-8276

Millot C., 1988. General features of the circulation in the Algerian Basin inferred from the Médiprod-5 experiment. Submitted to J. Geophys. Res..

Taupier-Letage I. and C. Millot, 1988. The 1984 circulation in the Algerian Basin. Oceanol. Acta, in press.

Taupier-Letage I., Benzohra M., Millot C., 1988. Confrontation of satellite thermal images and in situ current observations in the Algerian Basin during the Médiprod-5 experiment. Submitted to J. Geophys. Res..

O-IV9

Measuring of mesoscale eddy processes in the sea

Vlado DADIC and Arsen PUSKARIC

Institute of Oceanography and Fisheries, Split (Yugoslavia)

Studing and modelling of mesoscale eddy processes in the sea are based on the measuring different types of physical values.

At the Institute of Oceanography and Fisheries in Split, automatic meteorological-oceanographical station are under development. In this phase, one station is installed in Kastela Bay, middle Adriatic Sea. The first results of testing give us satisfied results.

Automatic meteorological-oceanographical statin serves for measurement of various meteorological and oceanographical parameters at the open sea in all meteorological conditions. The main parts of AMOS are: measuring station with anchored buoy and measuring instruments, relais-station with microprocessor unit, and shore station with computer system (Fig. 1.).

The main parts of measuring station are instruments (the most of them are Aanderaa production), and buoy with electronics for receiving data from all measuring instruments, their controlling and sending to transmitting antenna.

Relais-station with receiving antenna, microprocessor unit, RS232C interface, and modem is located on the nearest land of measuring station. It receives data from measuring station, store them temporarily, and sends to computer in shore station using VHF -radio or PTT link.

In shore station, with computer system and appropriate software data are received from relais-station in real time or under remote control, and after checking and processing they are stored in data base for future usage.

Results of real time data processing using automatic meteorological-oceanographical station represents an important improvement for modelling and monitoring mesoscale eddy processes in the sea as well as weather forecast.

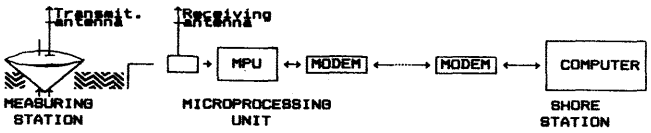

Fig. 1. Functional block-diagram of AMOS

REFERENCES

1. Berteaux, H. O. 1976. Buoy Engineering. New York, John Wiley & Sons, 309 pp.
2. Dadic, V. 1983. Problems of instrumentation for sea currents measurring. Theses. Elektrotechnic faculty of Zagreb, 175 pp.
3. Medeot, N., A. 1984. Michelato and P. Zennaro: A General purpose data acquistion system. Bollettino Oceanologia Teorica ed Applicata, Vol. II N. 4: 325-331.
4. Prandke, H., 1983: Mikrostrukturuntersuchungen in der Ostsee. Sonderdruck aus der Zeitschrift "Seewirtschaft", H. 2/S: 91-96.

O