XBT MEASUREMENTS IN THE DUBROVNIK-BARI TRANSECT - VOS2 ADRICOSM EXPERIMENT

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Abstract

The temperature data from recent XBT measurements were acquired during the October 2002 to September 2003 period, at the two transects, one across and the other along the Adriatic, during the first year of the ADRICOSM experiment. Through the data analysis, different phenomena were observed. The data from Dubrovnik-Bari transect were analysed, with a reference to the other measurements in the area.

Keywords: Adriatic Sea, temperature, salinity

Introduction

Thermohaline conditions of the South Adriatic behave in a slightly different way from East to the West coast. Intermediate layers of the South Adriatic are influenced by inflows of more saline (>38.7 PSU) (1, 2), and nutrient richer LIW water from the Mediterranean, while bottom layers of the West coast are under the influence of the NAdDW. The intrusions of LIW bring warmer water into the Adriatic (3), while those at the West coast bring less saline and colder waters. The LIW intrusions are stronger in the winter period especially when driven by the strong atmospheric pressure fluctuations (4) over the area wider than Mediterranean, however the condition for formation of NAdDW and stronger LIW intrusions seems to coincide, since both occur during cold winters.

The VOS2 ADRICOSM experiment performed in the Southern Adriatic enabled following a number of phenomena in a near real time. Combining these data with the other sea truth data acquired in the same area and time, and meteorological data, we were able to get better explanation about these phenomena.

Materials

Starting from October 2002, fourtheen VOS XBT measurements (10 stations) were performed within a year period: monthly in the cold season and with almost fouthnight frequency in warm season. Transect between Dubrovnik and Bari was survayed underway regular ferry connection. The ferryboat almost repeated the route (Fig. 1).

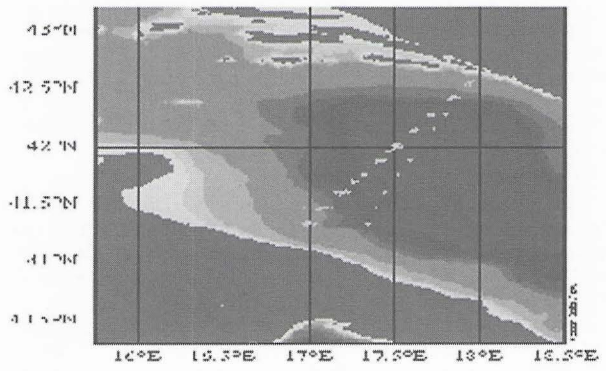

Fig. 1. Position of measuring stations with GPS, installed onboard the ship. During most of the VOS measurements, transects were very close, except in December 2002, when the ships' route deviated from usual.

Preliminary results

In the eastern side of the Adriatic temperature was higher in the whole water column most of the year, except in July, when the first meters of water were warmer in Italian side. The difference of almost 2°C between the surface temperature of the two sides was observed in December (Fig. 2). The temperature difference in deeper layers between the two sides may indicate intrusions of warmer LIW towards the Eastern coast.

The summer 2003 was dry and with moderate winds; especially the ethesian wind Maestral was not strong and frequent as usually. This resulted in a shallow thermocline ill the end of July. Only in September, after episodes of strong winds thermocline reached 30m.

Reference is also given to the measurements of the other VOS1 ADRICOSM group (OGS, Trieste), from Susac-Brindisi transect, that brought information about the longitudinal movements in the Southern Adriatic.

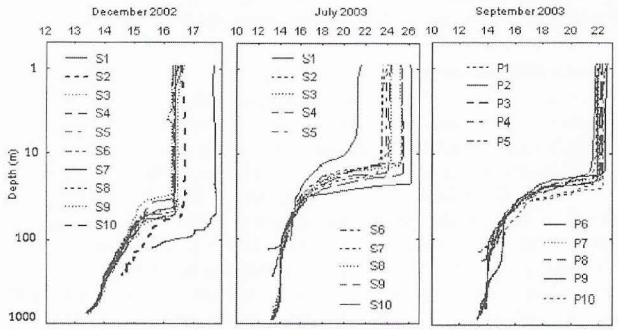

Fig. 2. Vertical temperature profile in the stations nearest to Dubrovnik and Bari, and the station in the middle of the transect.

The comparison was done between XTB data and CTD measurements acquired during the summer cruise of the international project Meduza (www.izor.hr/Meduza/index.htm) and the data measured through 2002-2003 period, in the frame of Jadran project (Croatian National Monitoring Program), both in close locations and times to XBT stations. From these data we tried to control salinity calculated from the sound velocity and temperature.

The measurements from the Southern Adriatic were supported with ECMWF reanalysis data for the region.

Through the ADRICOSM VOS2 experiment we were able to observe, in a near real time, a number of phenomena like evolution and breakdown of seasonal thermocline, effect of turbulent mixing due to the action of wind, spreading of the cold water vein along the Italian coast, intrusions of warmer LIW towards the Eastern coasts etc.

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