

# PRELIMINARY RESULTS OF MEDARGO: A EUROPEAN PROFILING FLOAT PROGRAM IN THE MEDITERRANEAN

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## Abstract

Four profiling floats were deployed in the Catalan Sea and provided temperature and salinity (TS), and subsurface displacement data for more than a month in fall 2003. The float data revealed high mesoscale variability in the upper sea and a strong shear in the currents between the surface and intermediate levels.

*Key-words* : Temperature and salinity, subsurface floats, Catalan Sea

## Introduction

In the framework of MEDARGO, which is part of the EU-sponsored MFS project (1), profiling floats will be deployed throughout the Mediterranean starting in late summer 2004 to provide TS data in near-real time to forecasting models of the Mediterranean. In order to assess the functionality of the floats and define their sampling characteristics, four units were operated in the Catalan Sea in fall 2003. Details about the floats' hardware and software, about their cycling and sampling and about the data telemetry are given hereafter. The float data in the Catalan Sea are described and interpreted, with particular focus on the thermohaline structures and the vertical shear of the currents.

## Materials and methods

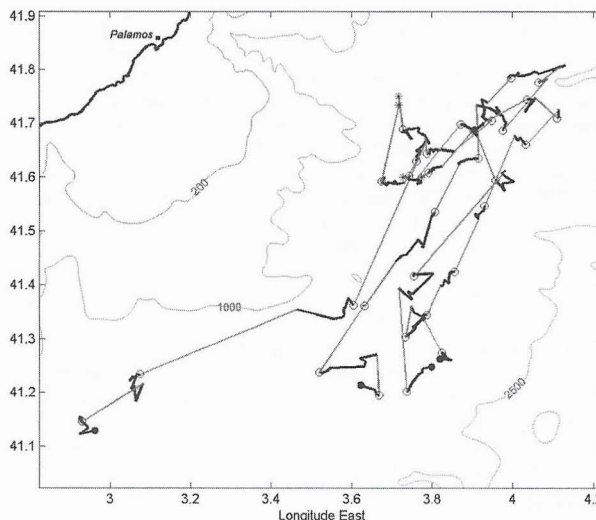
Two types of profiling floats were operated, one called APEX (manufactured by Webb Research Corporation, USA) and the other one PROVOR (produced by Martec, France). The APEX is the successor of the ALACE (2) whereas the PROVOR is based on the MARVOR technology (3, 4). Two units of each type were acquired. All floats were equipped with Sea-Bird CTD sensors (model 41 pumped MicroCAT). They were programmed in the "Park and Profile" configuration with a neutral parking depth of 350 m (near the salinity maximum of the Levantine Intermediate Water - LIW) and a maximum profiling depth of 700 m, with total cycle periods of 3.5, 4 and 7 days. When at surface, the floats are located by, and transmit data, to the Argos system onboard the NOAA satellites. The data are processed and archived in near-real time at the CORIOLIS Data Center (Brest, France; 4) and are disseminated on the GTS following the standards of the international ARGO program. The two APEX floats were deployed in the Catalan Sea on 26 September 2003. A week later, on 2-3 October 2003, the two PROVOR floats were deployed with the R/V *Garcia del Cid* in the vicinity of the APEX floats. CTD casts (from the ship) were made close to the float profiles. All floats were operated in "Park and Profile" mode until 7 November 2003 providing a total of 35 ascending TS profiles. Thereafter, the floats remained at surface until they were recovered.

## Results

The floats were deployed in an area where the prevailing slope currents are generally southwestward (Northern Current; 5). After showing some indication of subsurface flow towards the northeast after deployment, all the floats were trapped in the Northern Current and moved to the southwest (Fig. 1). Speeds at the 350 dbar level vary between 1 and 6 cm/s. Displacements during the time spent at surface can be of the same order of magnitude as the deep displacements especially for float 6900226. They show no preferential direction due to the large variability of the surface currents at meso and inertial scales. In some cases, the surface and intermediate displacements are in opposite directions, revealing a significant shear between the two levels.

The TS profiles obtained by the floats are typical for the region, with a marked salinity maximum in the LIW at about 400 m. The structure in the upper layer is highly variable and the depth of the seasonal thermocline varies between 30 and 70 m.

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**Fig. 1.** Float trajectories in the Catalan Sea. Thin straight (heavy curvy) segments denote the subsurface (surface) float displacements. Star and solid circles represent the deployment and last profile locations, respectively. Open circles represent the locations of the TS profiles. The 200, 1000 and 2500 m isobaths are shown.

## References

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