

MED-SHIP: FIRST PRELIMINARY RESULTS OF THE RECENTLY COMPLETED FIRST REPEAT CYCLE

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Abstract

Med-SHIP is an initiative for sustained ship-based observations covering the whole Mediterranean Sea and a range of biogeochemical variables. In 2016 the first circle of repeat surveys along the Med-SHIP network will have been completed. Here we outline the project and present first results from the first repeat cycle of Med-SHIP.

Keywords: Hydrography, Algerian Sea

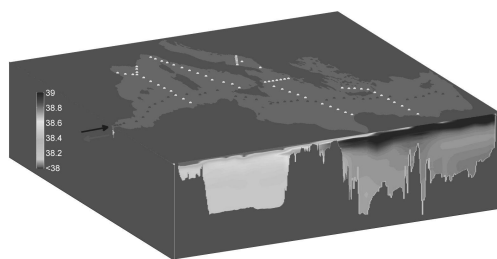


Fig. 1. Repeat Med-SHIP sections (low frequency zonal section in red, high frequency meridional sections in yellow), interior salinity along the zonal section is shown in color.

The Mediterranean Sea has so far been observed by ship-based research cruises at mainly irregular intervals, mostly by national initiatives in regional areas. Moreover, the Mediterranean has largely been neglected by global-scale international programs such as the one time survey conducted during the World Ocean Circulation Experiment (WOCE) and the subsequent repeat of key WOCE hydrographic lines that are promoted and coordinated by GO-SHIP (www.go-ship.org). The ship-based component of the observing system in the Mediterranean is not yet as well defined as other components, such as profiling floats, fixed point observatories or gliders. Coordinated, high-accuracy and high-precision, sustained observations of changes in water mass properties in the Mediterranean are urgently called for. Here we the first result of an initiative towards achieving this goal as spelled out in the Med-SHIP (Mediterranean Sea Ship-based Hydrographic Investigations Programme) initiative.

A workshop in May 2011 sponsored by the Mediterranean Science Commission (CIESM) defined Med-SHIP as a means to observe the Mediterranean in a manner similar to the international GO-SHIP programme [1, 2]. By Med-SHIP the Mediterranean marine science community is committing to conduct sustained, regularly repeated and internationally coordinated oceanographic surveys through the Mediterranean.

In response to documented changes, and to the expected acceleration of changes of the Mediterranean, marine scientists have designed a plan involving 5 hydrographic sections on which comprehensive physical and biogeochemical properties will be regularly measured to highest international standards: 2 north-south sections in each of the eastern and western Mediterranean and a zonal section from the Strait of Gibraltar to the easternmost Mediterranean. Primary objectives for the Med-SHIP repeat hydrography are twofold:

- (1) to observe long-term changes in physical and biogeochemical properties
- (2) to observe changes in the thermohaline circulation

The overall plan is for the north-south sections to be done every 3 years and the zonal section to be done every 6 years. During these cruises a suite of relevant physical, chemical and biological variables should be measured to the highest possible standard. The repetition frequency proposed for the Mediterranean is somewhat higher than in GO-SHIP, considering its typical shorter spatial and temporal scales. The zonal transect, repeated on a low-frequency basis and including the full suite of the GO-SHIP parameters, would allow to assess long-term variations of heat and freshwater budgets and to compute basin-wide inventories of natural and anthropogenic carbon in the Mediterranean, with a focus on its deeper layers, being less subject to small scale variability. But the Mediterranean is a “coastal ocean” with open ocean characteristics, where the circulation is not driven by basin scale forcings, but by intense, variable and diverse local forcings. With this regard the high-frequency repetition of subbasin meridional transects, including a subset of the GO-SHIP parameters, is essential to capture those degrees of variability.

If adequately funded and coordinated at an international level, Med-SHIP is now ready to become part of the Mediterranean and the global sustained observing systems, as a reference component for long term studies of processes, events and changes in the Mediterranean Sea.

Here we present preliminary results from the first repeat cycle of the Med-SHIP program: The zonal section carried out in 2011, and three short sections to be carried out in 2015 and 2016. In the framework of EUROFLEETS2, we were awarded 3 cruises (4 legs) during the 2015/16 time-frame: One section in the Eastern Mediterranean Sea on the Greek R/V Aegaeo in June, one section in the Tyrrhenian Sea and the Western Mediterranean Sea in August on the Spanish R/V Ángeles Alvariño, and two sections repeated twice across the Adriatic Sea on the Croatian R/V Bios-Dva in December 2015 and April 2016. Although only one of four legs have been completed at the time of writing this abstract, at the time of the CIESM congress, all legs should have been completed. We will also discuss possible future cruises within the Med-SHIP framework.

References

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